CITY OF BRIDGEPORT

DOUGLAS COUNTY **WASHINGTON**

STORMWATER MANAGEMENT PLAN

G&O #23851
MAY 2024

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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CHAPTER 1

INTRODUCTION

The City of Bridgeport, located in north Douglas County on the Columbia (see Figure 1-1) is a community of residential and commercial properties with the Chief Joseph Dam situated one and a half miles upstream. Bridgeport was incorporated on March 21, 1910. As part of the City's overall planning effort, the City intends for this Stormwater Management Plan (Plan) to provide guidance in developing and/or replacing the City's stormwater infrastructure, improving the water quality of surface water within the surrounding drainage areas, and helping to address flooding concerns seen in select portions of the City.

BACKGROUND

The Stormwater Management Plan provides guidance for the design and construction of the City's storm system to meet current and future needs. The Plan provides information about the City's existing stormwater infrastructure and related funding while identifying deficiencies and a recommended course of action to resolve them.

This Plan is intended to provide a fresh look into the condition of existing infrastructure and a current evaluation of stormwater areas of concern. The goal is to help the City be prepared for the future by ensuring that resources are allocated efficiently and that current stormwater issues are resolved.

A 1.0 percent annual growth rate is anticipated through year 2030 in Bridgeport. Per the City's 2016 *Urban Area Comprehensive Plan*, this growth is expected to result in a total population of 3,260 residents in 2035, which equates to an additional 647 people beyond the 2,613 people that currently live in the City. This plan is intended to help implement the City's overall vision for the City as it grows and changes through time.

Stormwater impacts and management can be influenced by the climate, natural environment, developed environment, and regulatory requirements. Natural and built environments that affect how the stormwater system is managed in Bridgeport includes:

- Ten inches of rain annually;
- Three major drainage basins;
- Stormwater culverts, ditches, catch basins, infiltration facilities and dry wells;
- Columbia River and Chief Joseph Dam;

- Population of 2,613;
- Currently no stormwater utility or a set budget for stormwater specific items.

Elements related to the natural environment listed above are described further in Chapter 2.

GOALS OF THE STORMWATER PROGRAM

The City has the following goals for the Stormwater Management Program:

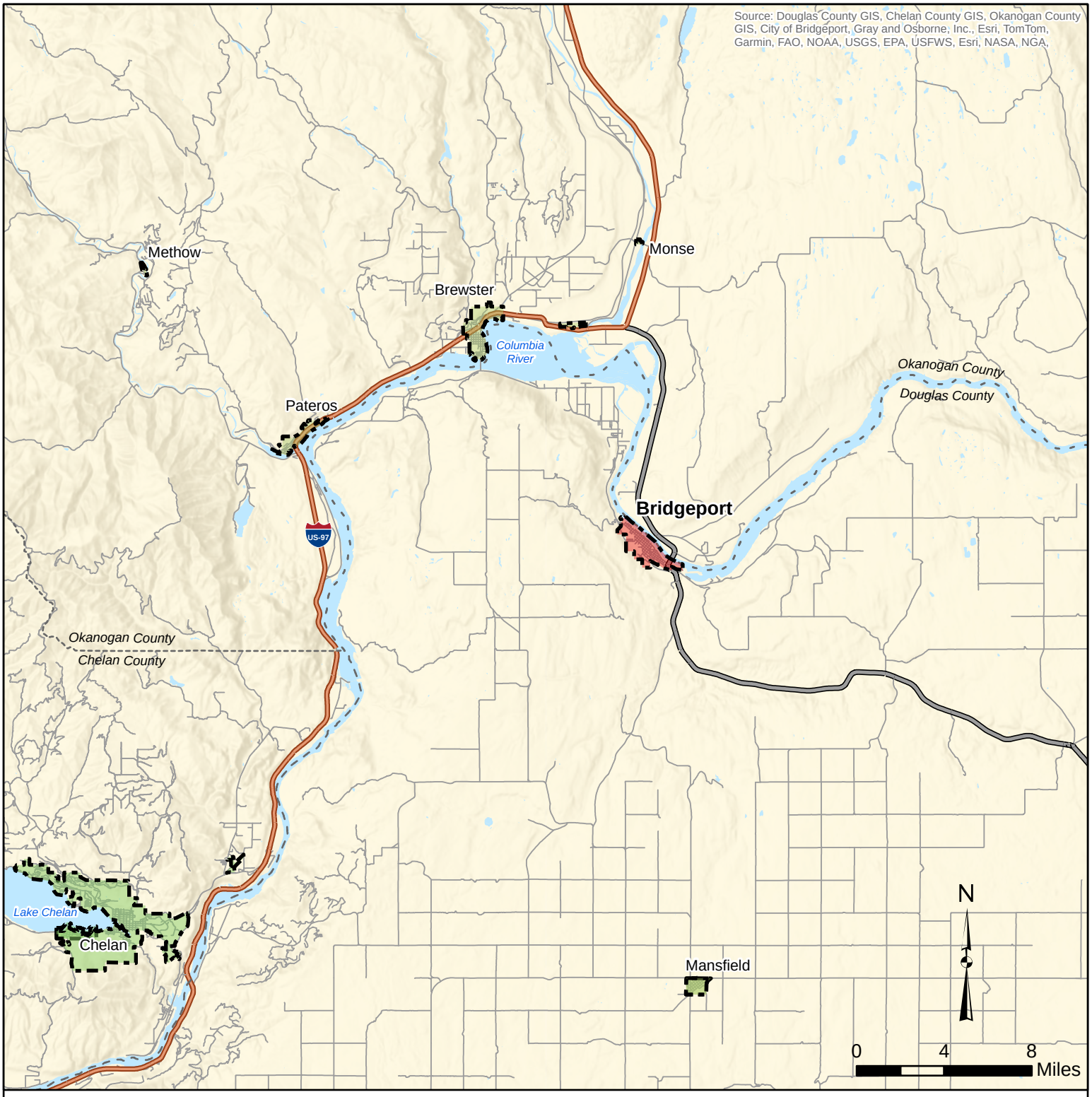
- Protect and enhance the City's financial health and stability while maintaining appropriate and essential public services in a cost-effective manner;
- Protect the environment and enhance the city's high quality of life, including air and water quality, and the availability of water;
- Review, prioritize, and implement capital infrastructure projects to include retrofitting areas of concern;
- Reduce pollutants entering nearby waterbodies;
- Encourage local involvement in protecting stormwater quality;
- Increase public awareness of pollutant spill prevention/proper cleanup.

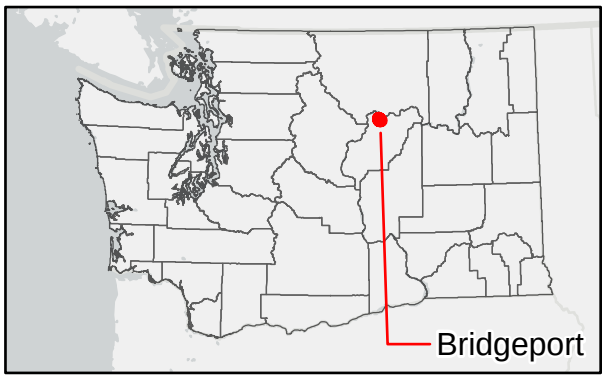
Implementation of this Plan will help the City meet its goals related to protecting the financial health of the stormwater system, addressing known flooding areas, developing effective public communication, and preserving and protecting surface water resources.

CURRENT STORMWATER RELATED ISSUES

Known stormwater related issues in Bridgeport include:

- Runoff from the plateau causes flooding at Raymond Avenue.
- Other flooding issues along 20th Street and 21st Street.
- Flooding causing silt to enter the Columbia River.





CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 1-1

VICINITY MAP

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RECOMMENDED ACTIONS

To meet these challenges, a stormwater program has been developed to mitigate the impacts of existing runoff by addressing flood related areas and improving water quality. Actions in the plan include retrofitting areas within the City that lack current infrastructure and implementing water quality related actions to protect downstream waterbodies.

CURRENT FUNDING

The City currently utilizes the general fund for any stormwater related capital or operational expenditures. Additional funding may also come in the form of loans or grants from state or federal programs. Certain expenses are paid from other sources as well, such as joint capital projects that include upgrades to other utility or transportation elements.

CHAPTER 2

DRAINAGE AREA CHARACTERISTICS

LOCATION

The City of Bridgeport was officially incorporated in 1910. The City's current Urban Growth Area (UGA) encompasses approximately 1.05 square miles of land as shown in Figure 2-1. The City is located in Douglas County on the Columbia River, approximately 70 miles northeast of Wenatchee. State Highway 173 passes through the City. Figure 1-1 provides a vicinity map of the area.

The City of Bridgeport has a combination of residential and commercial properties. Per the City's *Urban Area Comprehensive Plan* (2016), the 2015 population was approximately 2,596 representing 5.8 percent of the total population of Douglas County. The commercial land use is mostly located in the downtown area along State Highway 173 (also known as Columbia River Avenue). The remaining areas are designated as residential with some recreational areas.

TOPOGRAPHY AND WATER BODIES

The City's topography slopes to the northeast toward the Columbia River. The City itself is located on a relatively flat area with steeper slopes surrounding it to the southwest (see Figure 2-1). There do not appear to be any permanent streams tributary to the Columbia River within the city limits. The major temporary streams that flow during times of peak snow melt are shown in Figure 2-1.

Per the City's *Urban Area Comprehensive Plan* (2016):

> *Bridgeport is a small community located in the northern part of Douglas County in Sections 10, 14, 15, 22 and 23 in Township 30 North, Range 25 East, W.M. The community is located on relatively flat terrain. However, the southern portion of the community is bound by relatively steep slopes leading up to the Waterville Plateau. Additionally, the embankments adjacent to the Columbia River are quite steep and in many areas are at least 30 feet above the elevation of the Columbia River.*

DRAINAGE BASINS

The city limits for Bridgeport has three main tributary basins (Basins 1, 2, and 3), each flowing to the Columbia River. These basins encompass approximately 1,171 acres, 1,228 acres and 814 acres, respectively; including upstream portions within the City's UGA (see Figure 2-2). These basins are divided further into nine smaller drainage subbasins lying within the City's tributary area. These subbasins are named according to

the streets along their downstream flowpaths (i.e., "Basin 2-10th" flows primarily through a stormwater conveyance system located under 10th Street within Basin 2).

BASIN 1

This basin covers approximately 1,171 acres with approximately 28 acres in the UGA and 1,143 acres outside the UGA that is tributary to it. The area outside the UGA is steep-sloped and undeveloped brush land. The area inside the UGA is shallower sloped and mostly undeveloped but contains the City's wastewater treatment plant. There is no known stormwater collection in this area. Runoff from this drainage basin is collected in a natural channel and conveyed to the Columbia River.

BASIN 2

This basin covers approximately 1,222 acres with approximately 296 acres in the UGA and 926 acres outside the UGA that is tributary to it. The area outside the UGA is steep-sloped and undeveloped brush land with some agricultural parcels. The area inside the UGA is shallower sloped and contains much of the City's residential and commercial areas. This basin contains Subbasins 2-10th, 2-11th, 2-12th 2-14th and 2-Nth.

BASIN 3

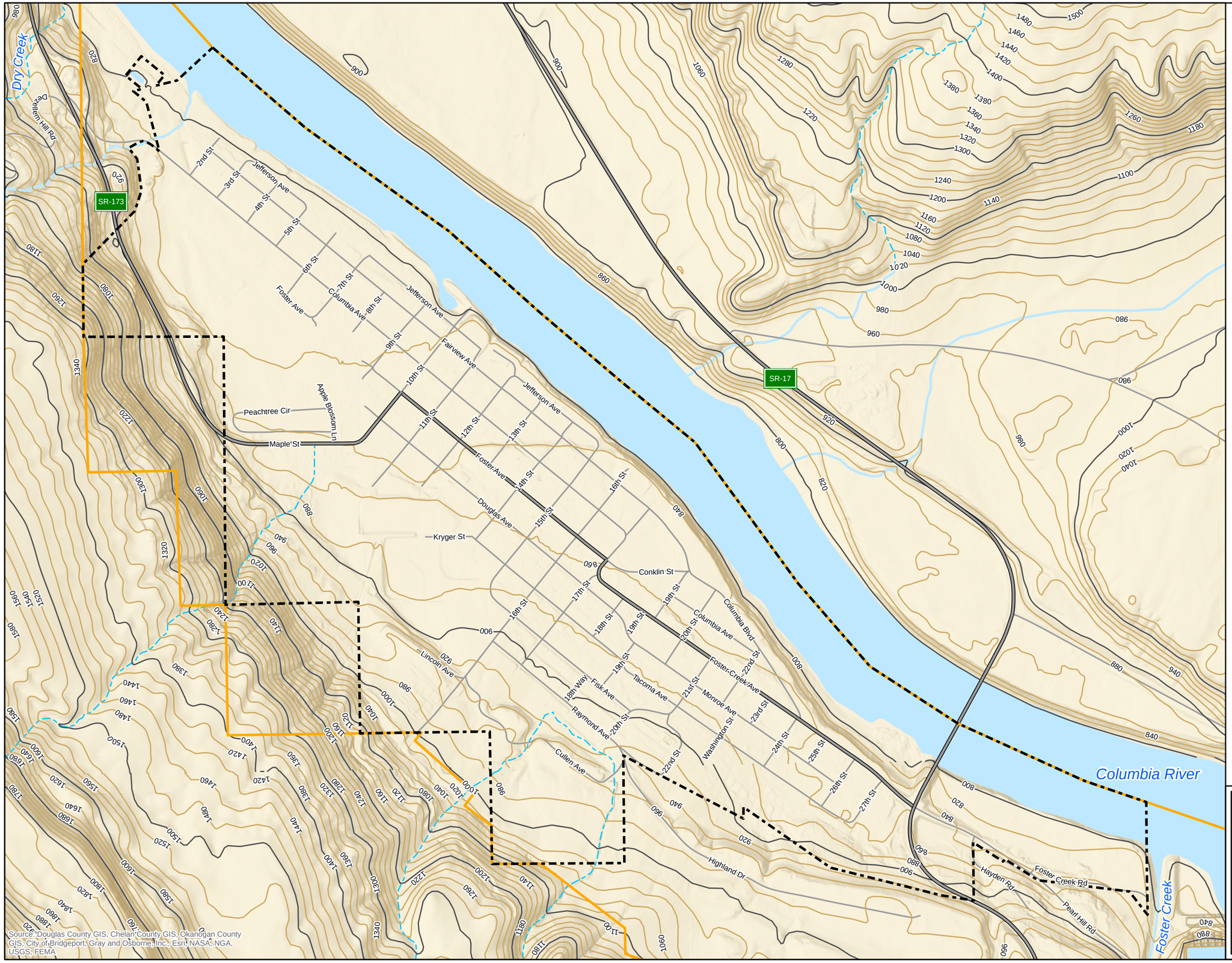
This basin covers approximately 814 acres with approximately 288 acres in the UGA and 526 acres outside the UGA. It is similar to Basin 2 in that the area outside the UGA is undeveloped brush land with some agricultural parcels whereas the area in the UGA contains residential and commercial buildings. This basin contains Subbasin 3-17th, 3-Foster and 3-Nth.

SOILS

Soils within the City's UGA are shown in Figure 2-3. Soils are shown in their hydrologic grouping where Type A soils are more permeable and Type D soils are less permeable. The largest portions of the soils in this area are sandy loams ranging from fine to gravelly along areas of complex soils. Slopes range from 0 to 60 percent.

LAND USE

Land use is shown in Figure 2-4. The City has a combination of residential, commercial and industrial land uses. The multi-family and commercially zoned areas are located primarily along State Route 173 whereas the low density residential areas are mainly located toward the southern portion of the City.



USGS Contours (Ft.)

- 100'
- 20'

Reference

- Roads
- Stream
- Intermittent Stream
- City Limits
- Urban Growth Area
- Surface Water

N

0 375 750 1,500 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 2-1

TOPOGRAPHY

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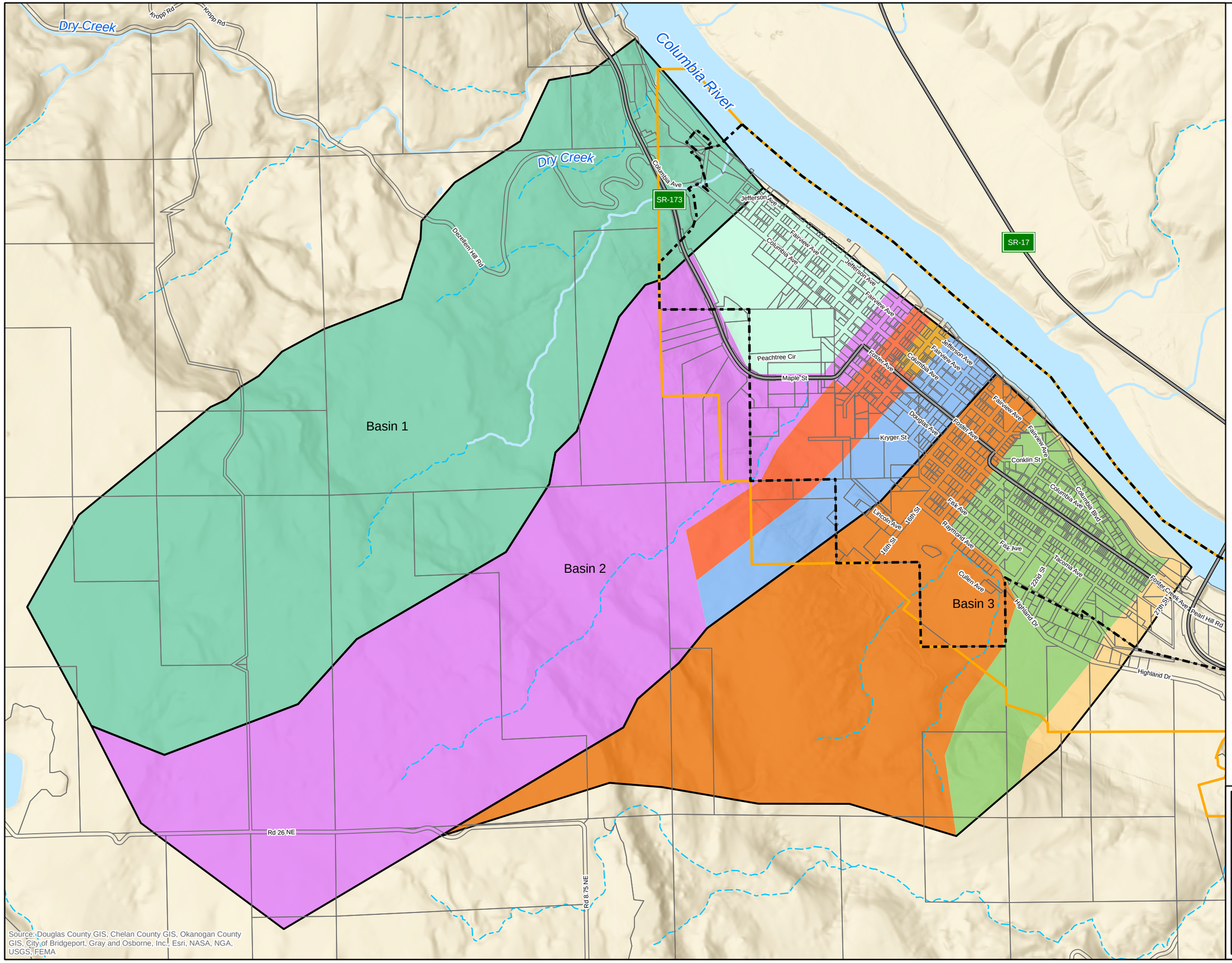

Stormwater Subbasins

- Basin 1: 1172 Acres
- Subbasin 2-10th: 904 Acres
- Subbasin 2-11th: 85 Acres
- Subbasin 2-12th: 8 Acres
- Subbasin 2-14th: 109 Acres
- Subbasin 2-Nth: 123 Acres
- Subbasin 3-17th: 535 Acres
- Subbasin 3-Nth: 225 Acres
- Subbasin 3-Foster: 54 Acres
- Storm Basins

Reference

- Stream
- Intermittent Stream
- City Limits
- Urban Growth Area
- Parcel
- Surface Water

N

0 500 1,000 2,000 Feet

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STORMWATER MANAGEMENT PLAN

FIGURE 2-2

DRAINAGE SUBBASINS

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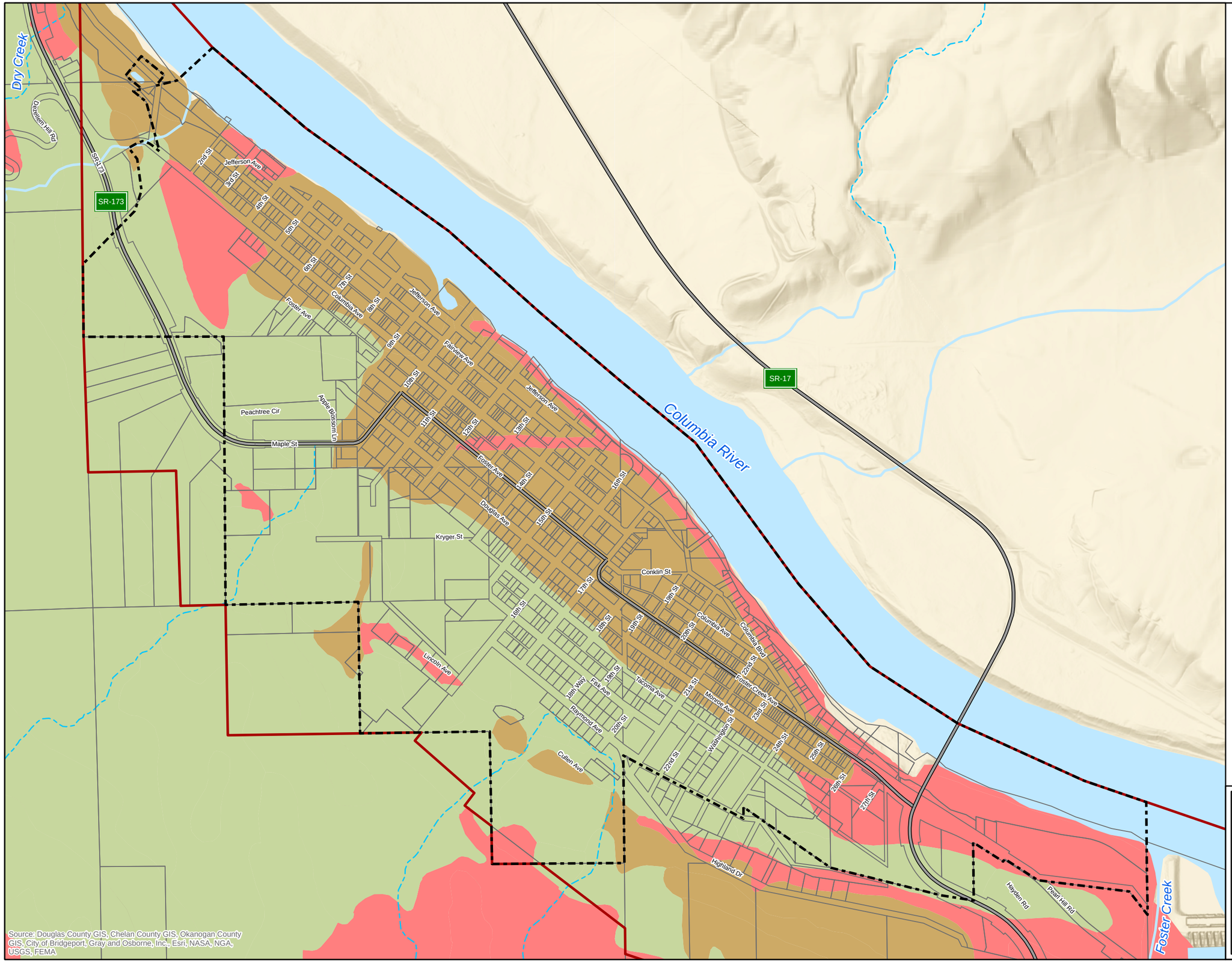

Local Soils - Drainage Class

- A - Excessively Drained
- B - Somewhat Excessively Drained
- C - Well Drained

Reference

- Stream
- Intermittent Stream
- City Limits
- Urban Growth Area
- Parcel
- Surface Water

N

0 375 750 1,500 Feet

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STORMWATER MANAGEMENT PLAN

FIGURE 2-3

SOILS

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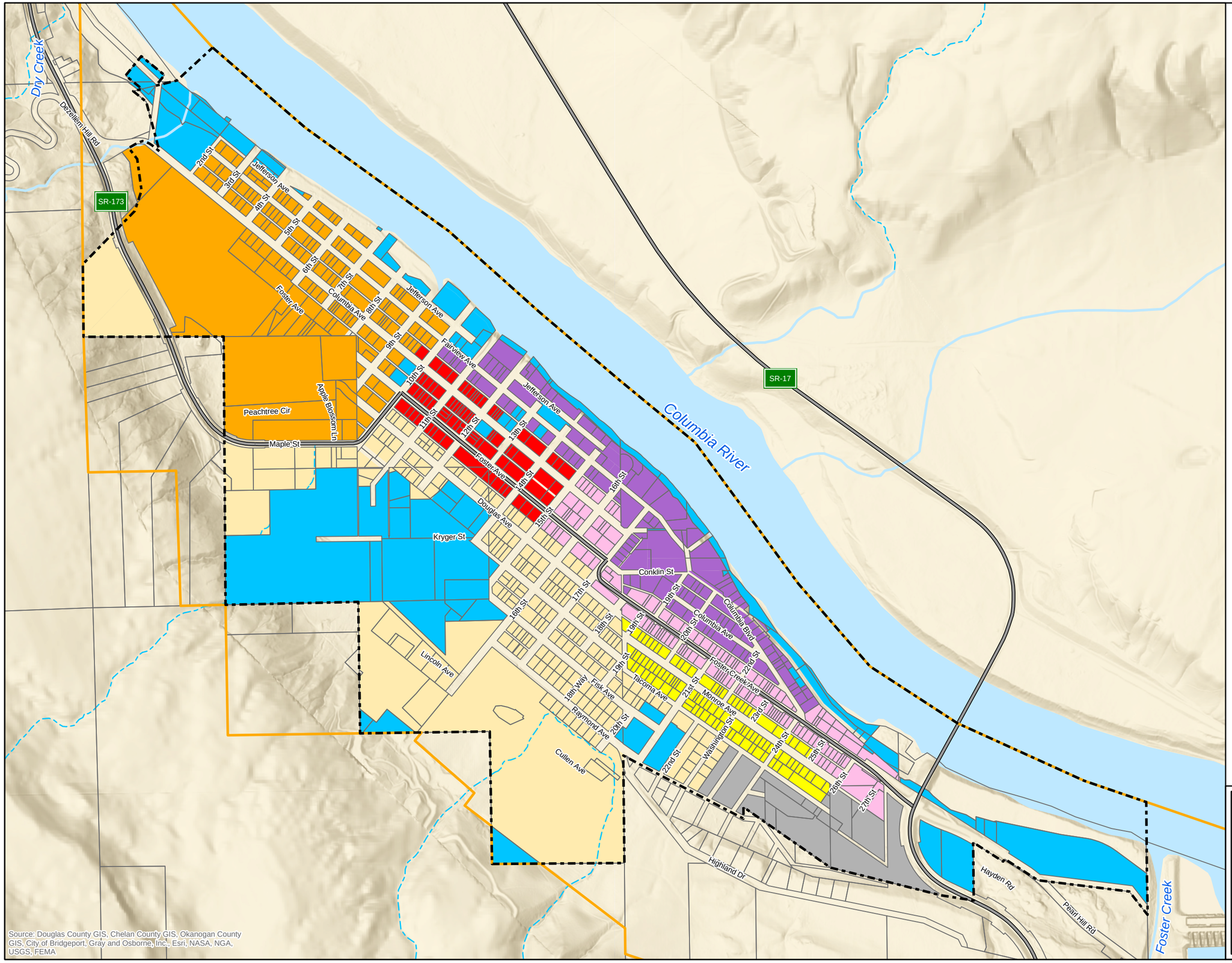

Source: Douglas County GIS, Chelan County GIS, Okanogan County GIS, City of Bridgeport, Gray and Osborne, Inc., Esri, NASA, NGA, USGS, FEMA

Land Use

- Traffic Commercial
- Tourist Commercial
- Public Use
- Single-Family Low Density
- Multi-Family High Density
- Mixed SF/MF Medium Density
- Light Industrial
- Central Business District

Reference

- Stream
- Intermittent Stream
- City Limits
- Urban Growth Area
- Parcel
- Surface Water

N

0 375 750 1,500 Feet

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STORMWATER MANAGEMENT PLAN

FIGURE 2-4

CURRENT LAND USE

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Per the City's *Urban Area Comprehensive Plan* (2016):

> *Based on the existing pattern of uses as well as population projections and capital facility and utility capacities, an Urban Growth Area was initially established in the 1990s that encompassed land expected to adequately accommodate expected growth within a planning horizon of 20+ years, to 2015. The original UGA generally followed the 1000' topographical contour interval, including all of the Cornehl Addition, except where the existing city limits falls outside of that; and, except from the southeast rim of the deep ravine located southeast of the city limits adjacent to HWY 17 where it followed the 1020 contour interval.*
>
> *As a result of the 2006 planning process and significant additional technical and mapping information, a revised UGA was identified to accommodate updated population projections to the year 2022. The UGA was changed along the southerly boundary to reflect parcel boundaries and property ownerships. The overall total land area added was minimal (approximately 56 acres), and much of it is encumbered by steep slopes and rocky ground. On the easterly edge of the UGA, land owned by the US Army Corps of Engineers (ACOE) was added to recognize that public services (water) exist in that area, and to facilitate cooperation between ACOE and the City when it comes to land use issues. This land is designated as "public," which is a continuation of an existing public designation.*

CLIMATE

Table 2-1 summarizes the historical average climate and precipitation data for the Bridgeport area, according to Western Regional Climate Center records from the station at Chief Joseph Dam. For the stormwater model, rain amounts were taken from isopluvial maps. A precipitation amount of 2 inches was used for the 25-year storm and 2.5 inches was utilized for the 100-year storm. To account for future climate change, rainfall was increased by 9 percent in accordance with the University of Washington's climate map.

TABLE 2-1

Average Monthly Climate Data

Month	High Temp. (°F)	Low Temp. (°F)	Precipitation (in.)	Snowfall (in.)
Jan	33	22	1.31	7.1
Feb	41	25	1.05	3.4
Mar	53	31	0.86	1.1
Apr	64	37	0.60	0
May	73	45	0.84	0
Jun	81	53	0.86	0
Jul	89	58	0.39	0
Aug	89	57	0.38	0
Sep	79	48	0.38	0
Oct	63	38	0.63	0.1
Nov	45	30	1.29	2.4
Dec	34	23	1.66	10.8

(1) Records reflect the timeframe of 10/1/49 through 6/9/16 as obtained from the Western Regional Climate Center.

CRITICAL AREAS

Discussed below are types of critical areas as identified by the Growth Management Act, which may be found within the City. The Growth Management Act requires cities to adopt development regulations to protect critical aquifer recharge areas, wetlands, fish and wildlife habitat areas, and geologically hazardous areas. The Bridgeport Municipal Code (BMC 4.10A) designates and regulates the following critical areas:

- Frequently Flooded areas
- Wetland areas
- Critical Aquifer Recharge areas (BMC 4.10D)
- Rivers and Streams
- Fish and Wildlife Habitat Conservation areas
- Geologically Hazardous areas

FREQUENTLY FLOODED AREAS

Per the City's *Urban Area Comprehensive Plan* (2016):

> *Frequently Flooded Areas are defined as those areas that have a one percent or greater chance of flooding in any given year. These areas may include, but are not limited to, streams (including intermittent ones), draws/ravines, rivers and*

> *wetlands (See Map EC6 in the Map). For the City, the most common flooding problems occur during extreme peak runoff events of short duration. These peak flows will occur with very little warning from the dry canyons and intermittent streams in the urban growth area and surrounding City. They are caused primarily by heavy rain on snow-covered, frozen ground in the spring or from severe thunder-storms during other times of the year. In 1989, there was a significant event that caused extensive damage in the Foster Creek drainage, primarily to the state, county and city road systems and to private residences.*

The 100-year flood hazard areas for the city are shown in Figure 2-5.

WETLANDS

Per the City's *Urban Area Comprehensive Plan* (2016):

> *Wetlands serve a multitude of functions that are crucial to human well-being and ecosystem integrity. Because of their interconnectedness with the geology, climate, aquifers and a myriad of other factors in a given area, they are a dynamic feature of the natural environment. Some of these functions include floodwater retention, sediment entrapment, water purification, groundwater recharge, maintenance of stream flows, shoreline stabilization, habitat for fish and wildlife, recreation, aesthetic values and education and research opportunities. It is the intent of these policies to provide a foundation for reasonable protection from the encroachment of changes in land use that would diminish the wetlands' diversity of values or degrade their quality.*
>
> *The National Wetland Inventory indicates that there are no wetlands within the UGA, although there are several areas, indicated by the NRCS Douglas County Soils data, that area hydrologic group D (very low filtration) that may have similar characteristics.*

Figure 2-6 displays the known wetland locations in the vicinity of Bridgeport according to the National Wetland Inventory.

AQUIFER RECHARGE AREAS

The Growth Management Act requires that potable water sources such as wells be mapped and assessed for vulnerability to ground or surface water contamination. Depending on the depth of the well, soil porosity, and other parameters, certain land uses may have a negative effect on water quality or replenishment for a specific well.

Per the City's *Urban Area Comprehensive Plan* (2016):

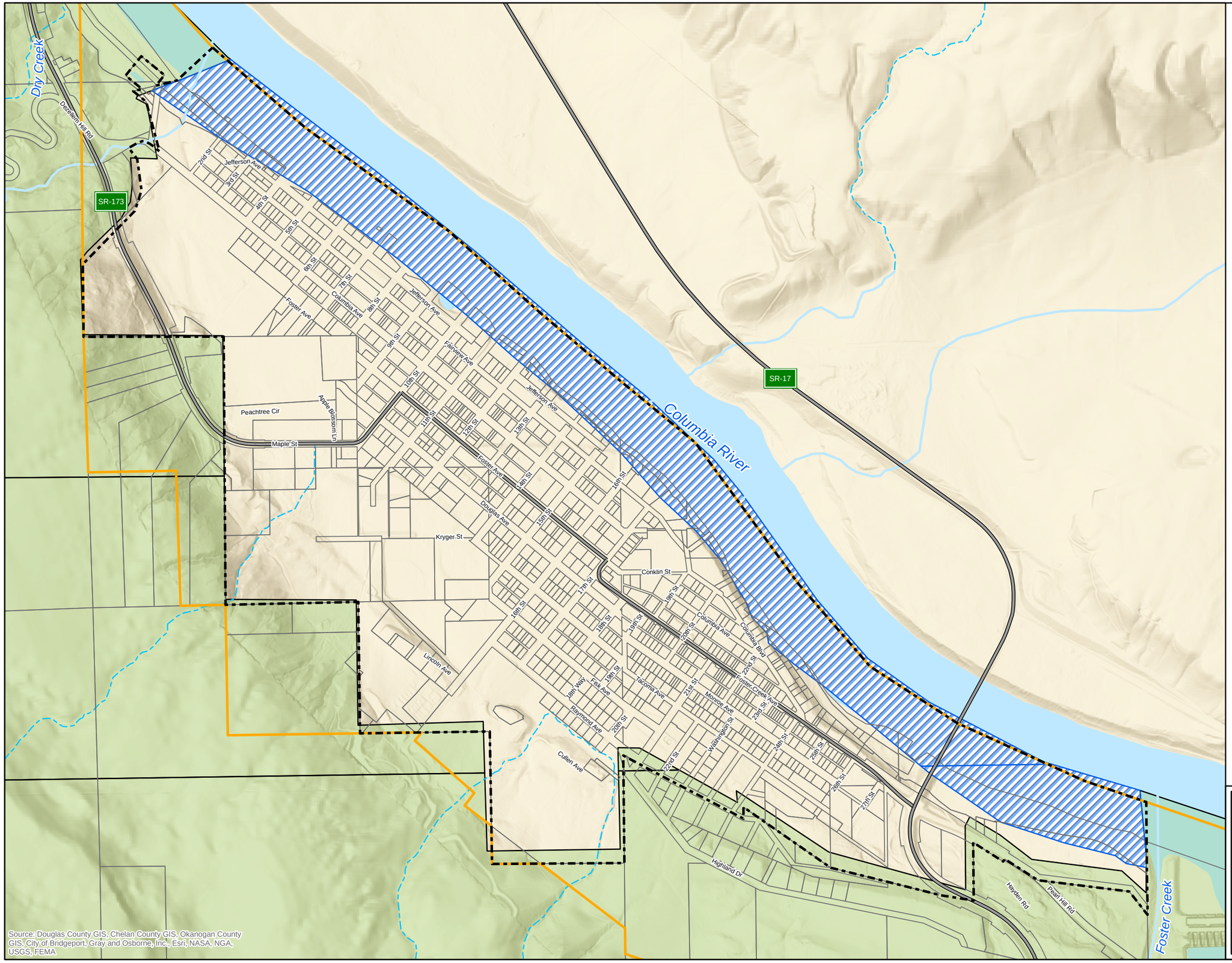
> *Groundwater is an essential natural resource that the residents of the City depend on as an important source of drinking water. Because remediation of contaminated groundwater is very costly, protecting and sustaining it has become of primary importance in recent years. One way to assure this resource is adequately maintained is to protect areas that provide a critical recharging effect to that groundwater resource. Within the City and its urban growth area, the exact nature of the aquifer(s) and their recharge areas is not yet fully understood. It is the intent of these policies to recognize the importance of protecting aquifer recharge areas. Because of the inter-relatedness of the aquifers, population increases and environmental concerns, it is necessary to protect all of the critical aquifer recharge areas as they become known.*
>
> *Within the City, the exact nature of the aquifer(s) and their recharge areas is not yet fully understood although the region falls under the "Columbia River Plateau basaltic rock aquifers" which are primarily an igneous and metamorphic rock aquifer, being researched by the USGS, as part of the Central Columbia River Plateau-Yakima River Basin Aquifer.*
>
> *A potential area of concern are soils with a high (quick) permeability; where potential pollutants could reach an aquifer before being "cleansed" by the natural filtration process of traveling through soil levels or wetland actions. There are soil types within Bridgeport with a rapid or moderately rapid permeability rate. Soil permeability is the quality of the soil that enables water or air to move through it*

BMC Chapter 4.10D, includes minimum standards for development within and adjacent to aquifer recharge areas.

FISH AND WILDLIFE HABITAT AREAS

Per the City's *Urban Area Comprehensive Plan* (2016):

> *The North Central Washington area is fortunate to have natural resources encompassing a large variety of environments. As demonstrated in national studies, many people participate in recreational activities that involve wildlife, including hunting, fishing, photography of wildlife, bird watching and feeding, among other things. Recreationally-oriented tourist activities provide an avenue for economic development in the area, capitalizing on these numerous natural resources through promotion of the area as a recreational destination. To that extent, as well as for the inherent importance of wildlife and the natural environment to the quality of life, it is the intent of these policies to recognize the importance of protecting fish and wildlife habitat conservation areas.*



Source: Douglas County GIS, Chelan County GIS, Okanogan County GIS, City of Bridgeport, Gray and Osborne, Inc., Esri, NASA, NGA, USGS, FEMA

Flood Hazard Areas (Local FIRM Map)

- 100 Year Flood Hazard
- Undetermined Risk

Reference

- Stream
- Intermittent Stream
- City Limits
- Urban Growth Area
- Parcel
- Surface Water

N

0 375 750 1,500 Feet

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STORMWATER MANAGEMENT PLAN

FIGURE 2-5

FLOOD HAZARDS

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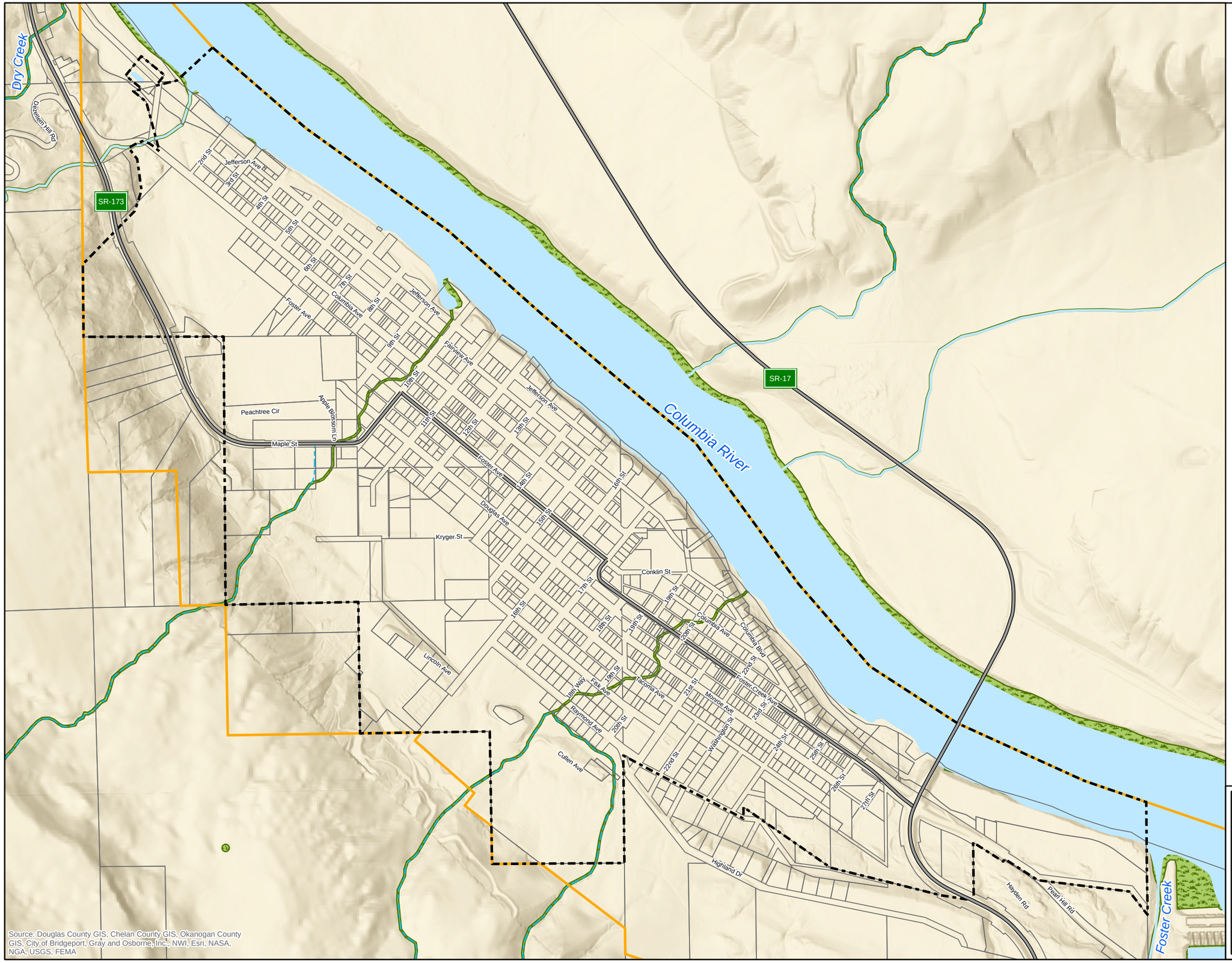

Source: Douglas County GIS, Chelan County GIS, Okanogan County GIS, City of Bridgeport, Gray and Osborne, Inc., NWI, Esri, NASA, NGA, USGS, FEMA

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STORMWATER MANAGEMENT PLAN

FIGURE 2-6

WETLANDS

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Washington Department of Fish and Wildlife provides and maintains Priority Habitats and Species (PHS) data, which includes species of concern, sensitive, threatened and endangered species; it indicates that no priority habitats and species are within the city's UGA. However, there are several adjacent to the city that should be considered during land use decisions and possible future UGA expansions. These included being a major area of winter roosting; major winter range of mule deer in/near the UGA; chukar habitat (rocky/cliff habitat); elk habitat up slope of the Okanogan side of the Columbia River; UGA and surrounding orchards heavily used by California quail; waterfowl concentrations- Canada goose, widgeon, green-winged teal, mallard, divers; and point data showing Sharp-tailed grouse upslope of the UGA and historical white-tailed jackrabbit (1980) as well as three ESA listed fish species within the Columbia River - bull trout, steelhead and spring Chinook.

Figure 2-7 shows fish and wildlife habitat areas in the vicinity. BMC Chapter 4.10C, includes minimum standards for development within and adjacent to fish and wildlife areas.

GEOLOGICALLY HAZARDOUS AREAS

Geologically hazardous areas are defined in the City's Comprehensive Plan as lands susceptible to hazards associated with the underlying soils and geology. These include areas characterized as being subject to erosion, landslides, mine hazards, and seismic movement. Generally, these areas warrant additional engineering investigation to assess the level of hazard and would typically require setbacks from these areas, special construction techniques, or outright prohibition with respect to land disturbance and development.

Areas identified as geographical hazards are shown in Figure 2-8 and are located in the areas surrounding the living areas of the city as well as the steep sloped areas adjacent to the Columbia River. Any construction site where the vegetation has been removed becomes a hazard, and requires adherence to construction best management practices to avoid the mobilization and transport of sediments into the storm drainage system. Land use planning strategies and building codes can be used to reduce the health and safety risk in the city while allowing development to proceed.

BMC Chapter 4.10F includes the standards that must be met for development within a geologically hazardous area. In addition to following applicable federal, state and local building codes appropriate drainage, grading, excavation and erosion control measures that have been determined by a site-specific study must be implemented.

POPULATION TRENDS

Residential population for the City is estimated in the City's *Urban Area Comprehensive Plan* (2016) to be 2,596 people in 2015. Table 2-2 summarizes the historic population estimates from 2010 based on the U.S. census and the forecasted population estimates from the City's Comprehensive Plan based on an assumed approximate 1 percent growth rate.

TABLE 2-2

Population

Year	Population[(1)]
2010	2,430
2015	2,596
2020	2,762
2025	2,928
2030	3,094
2035	3,926

(1) Population data from U.S. Bureau of the Census, 2010 Census Data and the *Urban Area Comprehensive Plan* (2016)

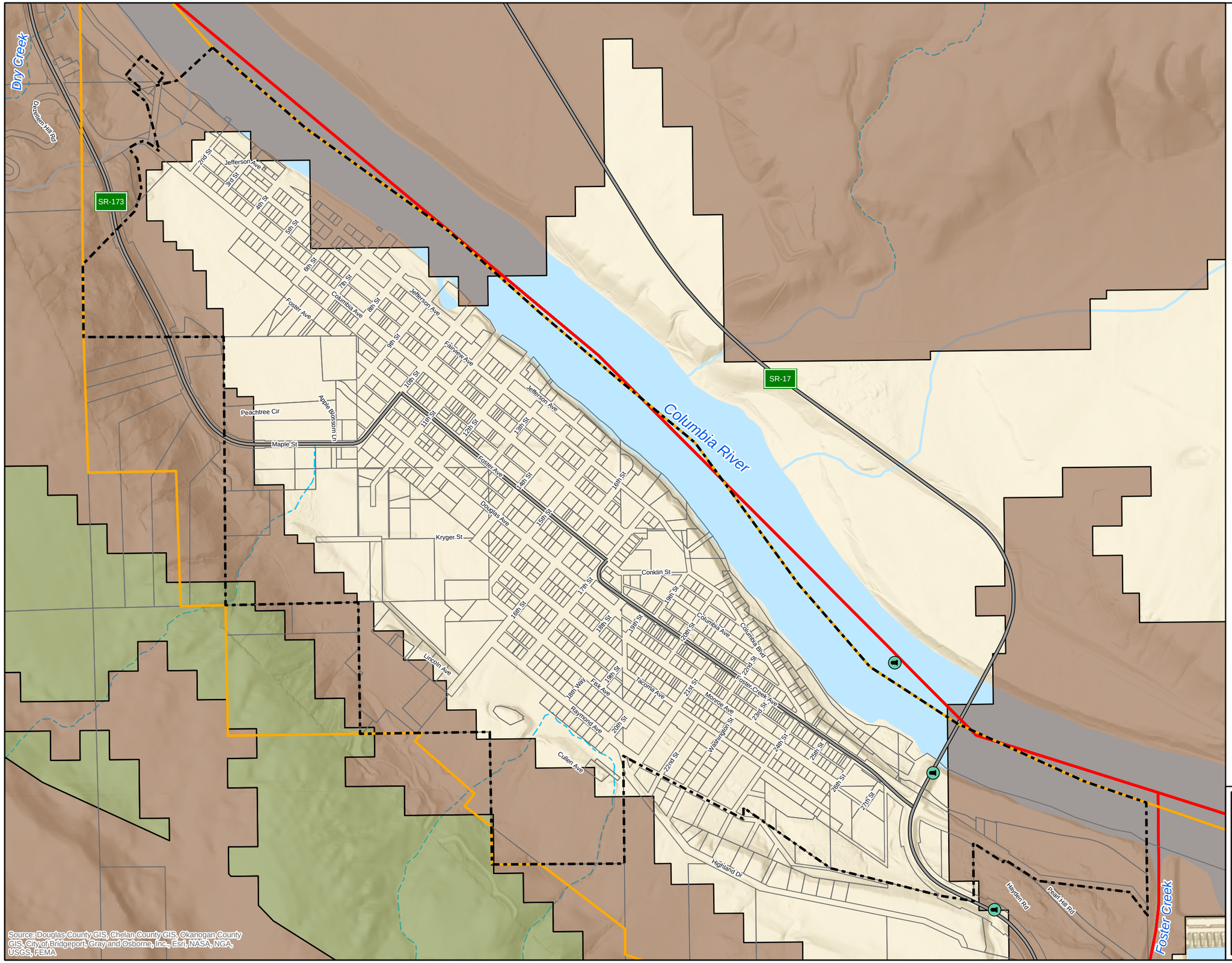
EXISTING STORMWATER SYSTEM

The existing stormwater conveyance system for the city consists of a combination of open ditches, pipes, culverts, and overland sheet flow. An inventory of the storm drainage conveyance system has been developed based on current knowledge, field visits, and as-built information available (see the base map in Figures 2-9 and 2-10). The following provides greater detail about the conveyance systems within each basin.

Per field observation and best available knowledge the storm system has approximately 11 outfalls city wide, which discharge directly to the Columbia River. There may be additional outfalls to be found.

Basin 1

Runoff from Basin 1 is collected in a drainage ditch which flows through the north end of the city limits. It discharges into the Columbia near the site of the waste water treatment plant. The city has not identified any problems within this basin or within its conveyance system. Stormwater modeling results show that this basin does not have any capacity issues however, it should be noted that the model was conducted based upon assumptions and limited available information. The main ditch within the basin should be monitored for erosion issues.



Source: Douglas County GIS, Chelan County GIS, Okanogan County GIS, City of Bridgeport, Gray and Osborne, Inc., Esri, NASA, NGA, USGS, FEMA

Priority Habitat and Species Program Areas - WDFW

- Eco-regionally important areas providing core habitat for many native species. Large, intact, landscapes support population viability of native species. Relevant to regional planning for open space, land use intensity, major projects.
- Eco-regionally important corridors enabling species movement among key areas. Large, intact, landscapes support population viability of native species. Relevant to regional planning for open space, land use intensity, major projects.
- Fish Passage Sites - WDFW
- Fish Bearing Streams - WDFW

Reference

- Stream
- Intermittent Stream
- City Limits
- Urban Growth Area
- Parcel
- Surface Water

N

0 375 750 1,500 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 2-7

FISH AND WILDLIFE HABITAT

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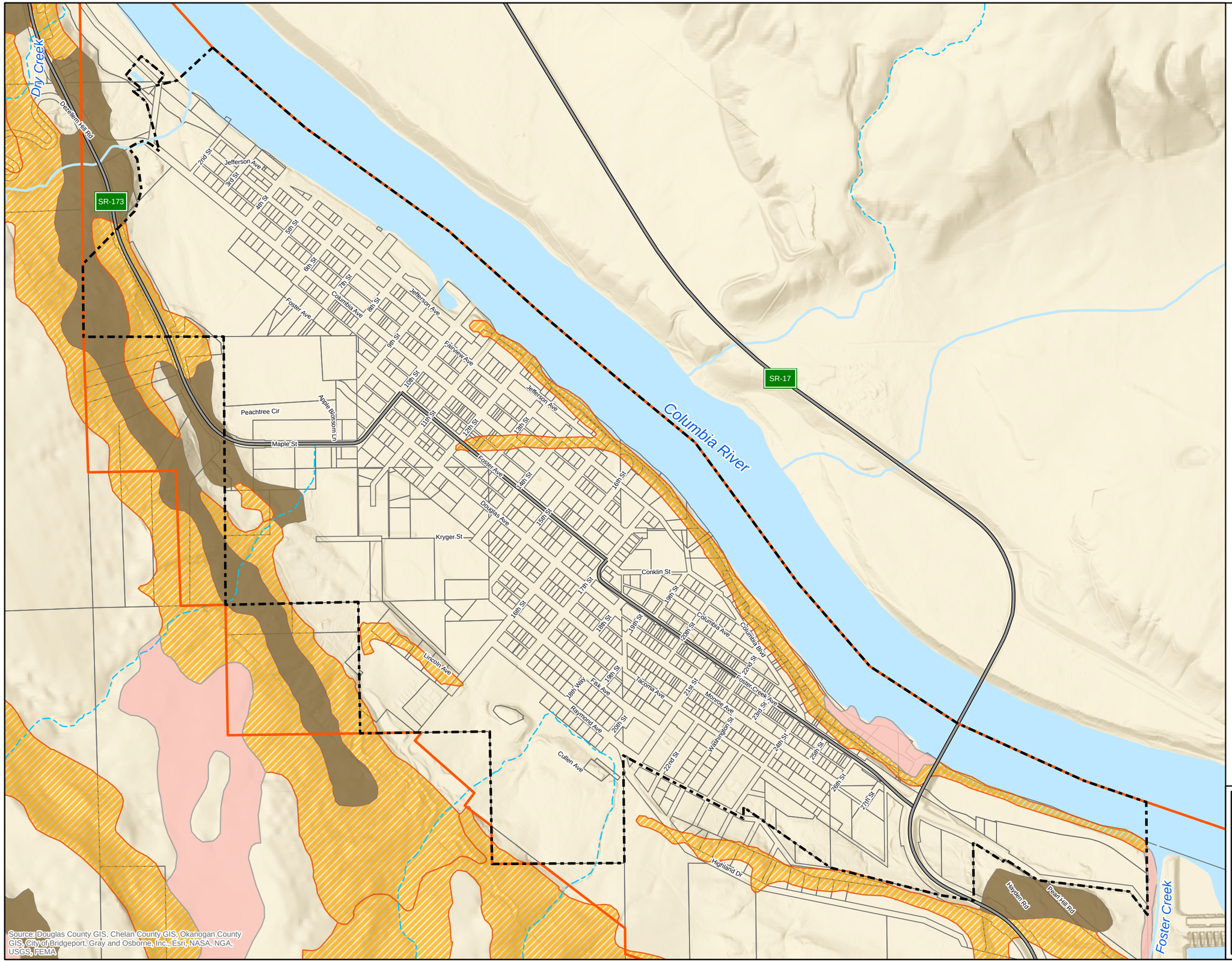

Geohazard Soils

- Multiple Limitations
- Slopes > 15% and Hardpan/Bedrock
- Slopes > 40%

Reference

- Stream
- Intermittent Stream
- City Limits
- Urban Growth Area
- Parcel
- Surface Water

N

0 375 750 1,500 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 2-8

GEOLOGIC HAZARDS

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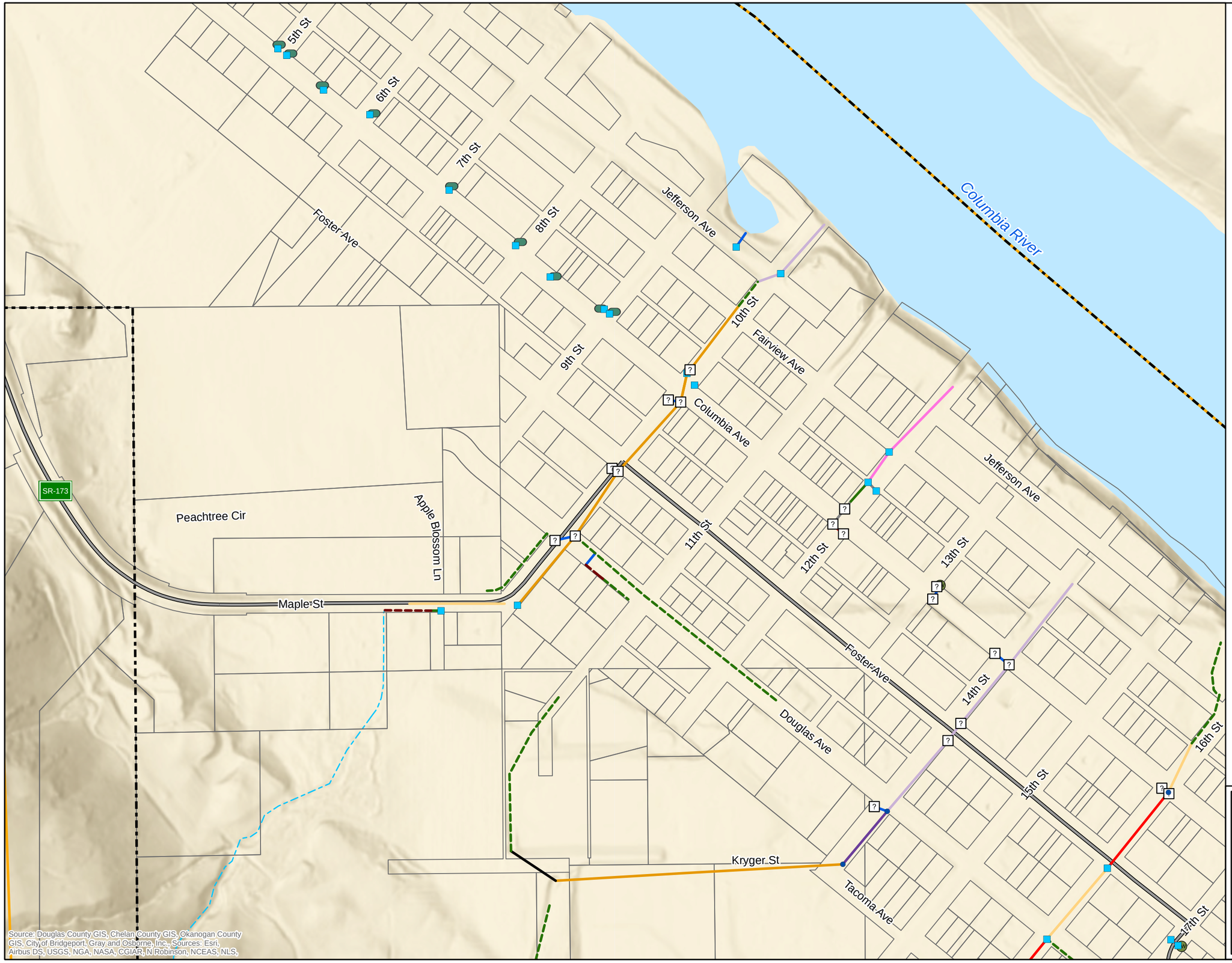

Catch Basins
- Type 1
- Type 2
- Unknown
- Drywell
- Infiltration Chambers

Stormwater Pipe (Diameter)
- Unknown
- 6"
- 9.5"
- 10"
- 12"
- 16"
- 18"
- 24"
- 30"
- 36"
- Ditch
- Culvert

Reference
- Intermittent Stream
- Highway
- City Limits
- Urban Growth Area
- Parcel
- Surface Water

N

0 125 250 500 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 2-9

EXISTING STORMWATER INFRASTRUCTURE - NORTHWEST ZONE

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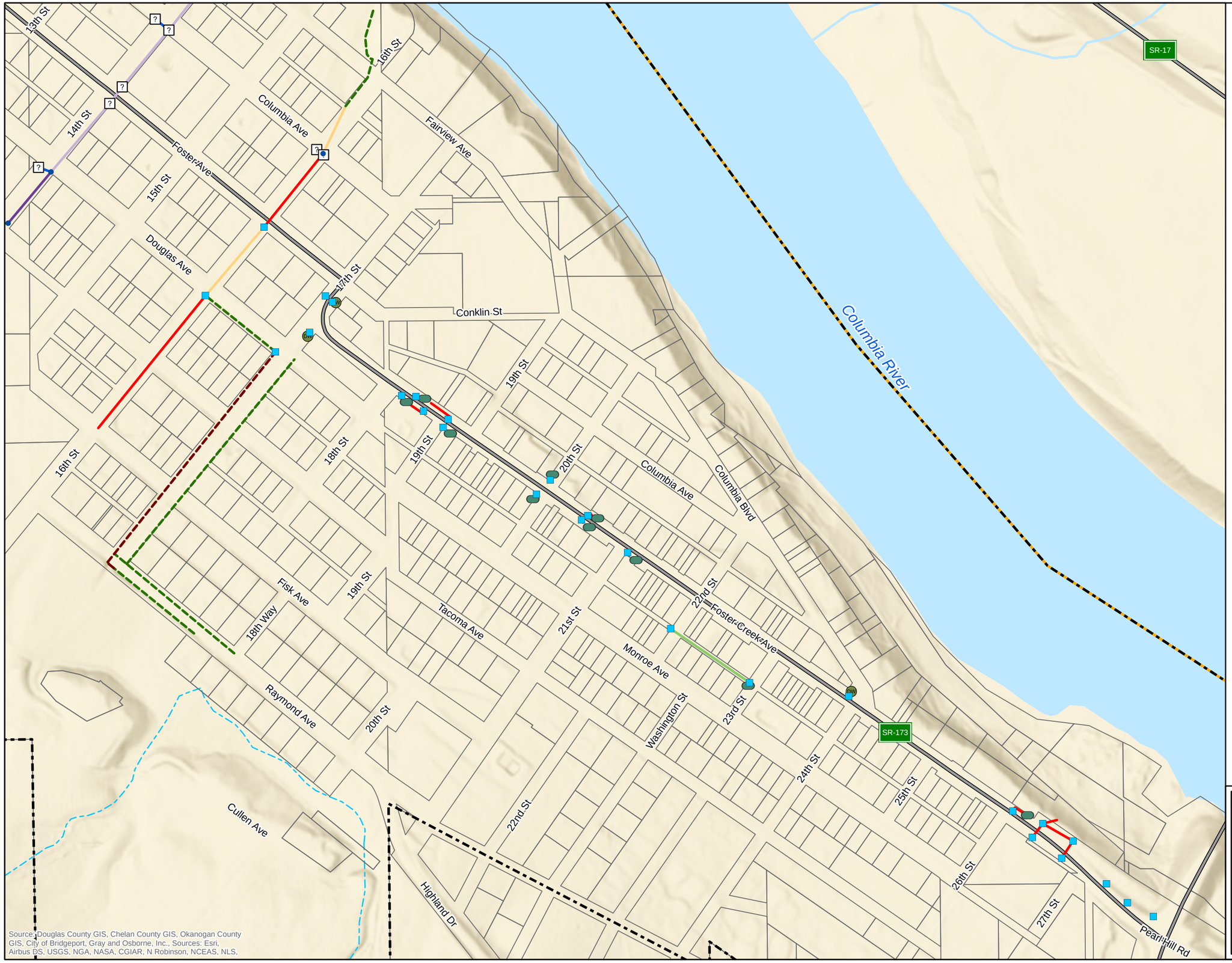

Catch Basins

- Type 1
- Type 2
- Unknown
- Drywell
- Infiltration Chambers

Stormwater Pipe (Diameter)

- 6"
- 8"
- 12"
- 16"
- 18"
- 24"
- 30"
- Ditch
- Culvert

Reference

- Stream
- Intermittent Stream
- Highway
- City Limits
- Urban Growth Area
- Parcel
- Surface Water

N

0 125 250 500 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 2-10

EXISTING STORMWATER INFRASTRUCTURE - SOUTHEAST ZONE

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Basin 2

The stormwater conveyance for Basin 2-10th is conveyed to the Columbia River in an 18-inch stormwater pipe that runs along 10th Street. The City has observed issues with flooding in this subbasin.

Per field observation and information provided from the City, Basin 2-14th and Basin 2-11th share a drainage flow path. The upstream portion of this shared basin flows into a pond structure. During low flow events, runoff can infiltrate into the ground and overflow to the east toward 14th Street in an 18-inch pipe under the ballfield and school parking lot. The pond also has a gate which can be manually raised to divert runoff toward 11th Street in high flow events through a 36-inch diameter pipe. Exact elevations are not known but the invert of the 18-inch pipe toward 14th Street is higher, acting as an overflow. The invert to the 36-inch pipe is lower. As such, it becomes the primary outlet and drains the entire pond structure when open.

11th Street has a valley gutter in the center of the road to act as a conveyance channel for stormwater. If the gate to the 36-inch pipe is open, stormwater discharges onto 11th Street and flows down this gutter toward the Columbia River. Historical flooding in the region has been mitigated by adding this diversion toward 11th Street. The conveyance down 14th Street conveys stormwater to the Columbia River in an 18-inch pipe. Stormwater modeling has found that this pipe is undersized if all upstream flow is directed to it (i.e., if there is no diversion to 11th Street).

The stormwater conveyance for Basin 2-12th is conveyed to the Columbia River in a 10-inch stormwater pipe that runs along 12th Street. This is a small subbasin beginning at the intersection of 12th Street and Columbia Avenue. The City has observed flooding in this subbasin.

Basin 3

The stormwater runoff from Basin 3-17th flows from the hill through a series of check dams. Field observations noted that these check dams have become filled with sediment and are likely no longer functioning at peak capacity. From there, stormwater runoff enters the city storm system where it is conveyed in a series of 16-inch pipes along 17th and 16th Streets. At Fairview Avenue, this system daylights and sheet flows to the Columbia River. The City has observed that this sheet flow impacts private property.

Basin 2-N and Basin 3-N lack stormwater conveyance to the Columbia River. Instead runoff from these basins flow into new infiltration facilities along Columbia Avenue, Foster Creek Avenue, the 2000 block of Tacoma Avenue, 23rd Street between Foster Creek Avenue and Monroe Avenue, and 20th Street. Field inspection did not observe any issues with the infiltration systems. In order to ensure their continuing function, it is recommended that these infiltration facilities be regularly maintained.

The smaller drainage areas within Subbasin 3-Foster all discharge from catch basins along Foster Creek Avenue where flow continues directly to the Columbia River. There were no problems observed with these areas but continuing maintenance is recommended to ensure this area functions effectively.

CHAPTER 3

STORMWATER SYSTEM ANALYSIS

INTRODUCTION

The location of known stormwater infrastructure is shown in Figures 2-9 and 2-10. Existing stormwater systems were documented in either record drawings or by approximate field measurement.

In this chapter, current problems associated with the City of Bridgeport's storm system are described, along with an introduction to potential solutions. Problems are either citywide in nature or are geographically specific.

BASIN FLOW RATES

To understand the magnitude of flooding concerns, the flow rates for each basin were calculated using the 25-year and 100-year storm events as modeled with an SCS Type 1A, 24-hour storm event. Table 3-1 below shows the percentage of impervious areas used in the model for the existing and future conditions as well as the resulting flow rates for each subbasin. Existing impervious coverage was calculated based on review of aerial imagery and future impervious coverage assumes an increase based on potential future development.

TABLE 3-1

Basin Impervious Surfaces and Existing Flows

Area ID	Basin	Area (AC)	Existing Percent Impervious	% Impervious Source	Existing		25-Year (cfs)	100-Year (cfs)	Future		25-Year (cfs)	100-Year (cfs)	Future Dev % Impervious
					Imp (ac)	Perv (ac)			Imp (ac)	Perv (ac)			
-	1	1172.00	5%	Based on Aerial Images	58.60	1113.40	18	32	**117.20**	**1054.80**	26	53	**10%**
-	2-NTH	123.00	15%	Based on Aerial Images	18.45	104.55	2	4	**18.45**	**92.25**	5	14	**25%**
F1	2-10TH	904.00	5%	Based on Aerial Images	45.20	858.80	14	25	**45.20**	**813.60**	20	41	**10%**
-	2-11TH	85.00	15%	Based on Aerial Images	12.75	72.25	4*	7*	**12.75**	**68.00**	5*	17*	**20%**
F2	2-12TH	8.00	25%	Based on Aerial Images	2.00	6.00	0.2	1	**2.00**	**6.00**	0.3	1	**25%**
F3	2-14TH	109.00	15%	Based on Aerial Images	16.35	92.65	4*	7*	**16.35**	**87.20**	5*	17*	**20%**
F4, F5, M1	**3-17TH**	**535.00**	**5%**	**Based on Aerial Images**	**26.75**	**508.25**	**8**	**15**	**26.75**	**481.50**	**12**	**24**	**10%**
-	3-NTH	225.00	15%	Based on Aerial Images	33.75	191.25	4	8	**33.75**	**180.00**	6	20	**20%**
-	3-FOSTER	54.00	5%	Based on Aerial Images	2.70	51.30	0.8	1	**2.70**	**48.60**	1	2	**10%**

(1) Basins 2-11th and 2-14th share a tributary area. Each conveyance system was modeled conservatively, assuming all runoff is routed through the modeled system and that no flow was being diverted to the other basin.

STORMWATER CONCERNS

Numerous areas within the City of Bridgeport have been found to flood during storm events. These areas often have a lack of a conveyance system. Failing infrastructure is also a concern, as pipes and other structures approach the end of their lifespan.

Another concern is climate change, which is expected to bring more frequent and intense storms. These larger storm events may result in increased flooding, stormwater runoff and soil erosion.

City-Wide Potential Solutions

The following lists potential action items to address the citywide concerns related to stormwater issues:

- Strong Maintenance Program. A rigorous maintenance program to prolong the life of stormwater facilities throughout the city.
- Implementing Low Impact Development (LID) to address pooled runoff areas and enhance water quality.
- Retrofit Areas. As older areas of the city undergo road improvements, stormwater conveyance, flow control and water quality treatment projects can be implemented if necessary.
- Proactive Stormwater Facility Inspections. Regular inspections of stormwater facilities to identify needed maintenance or repair.

FIELD IDENTIFIED PROBLEMS

Specific problems in the City of Bridgeport's storm system were identified from staff interviews and site visits. With flooding-related concerns as the top priority, the projects were then prioritized by City staff based upon the severity of the problem. Figure 3-1 shows an overview of the location of the identified issues and their tributary areas. Each issue is labeled with "FX" or "MX" where "F" represents a field identified issue, "M" represents a model identified issue and "X" represents a numerical identifier. A description of each issue and potential solutions is provided below.

Depending on the issue type and the amount of detail known, potential solutions to items identified in Figure 3-1 range from installing stormwater piping to implementing flow control facilities. It should be noted that infiltration tests were not performed as part of this planning process. The potential solutions listed herein will require engineering design, including hydraulic modeling, infiltration testing (if necessary), and analysis of site suitability criteria (such as ensuring proper setbacks are feasible). In addition, the

potential solutions may require adding additional tasks into the City's maintenance schedule to ensure proper operation.

Where possible, water quality treatment alternatives such as biofiltration swales and sediment ponds have been considered. Emerging technologies such as cartridge-based filter systems or biomedia-based products are alternatives that may be installed in most of the field identified areas. However, these emerging technologies were not listed in the specific discussions below due to the concern of the products being proprietary and potentially high in maintenance cost. During review of actual site conditions, these facilities should not be ruled out during the design phase.

A prioritized capital improvement program will help plan for the most critical projects first and the less critical projects as funding allows. Chapter 6 discusses capital improvement projects in greater detail.

F1A: 10th Street Overland Flow

The conveyance for this part of Basin 2 runs down 10th Street to the Columbia River in an 18-inch diameter stormwater main. According to the City's observation, there have been issues in the past with stormwater from the hillside flowing overland and onto the road near the intersection of Maple Street and 10th Street. Field inspection of this area found that an 18-inch diameter culvert pipe in this intersection is broken, forcing stormwater flow across the road into the curb and gutter instead of into the pipe (see Figure 3-2).

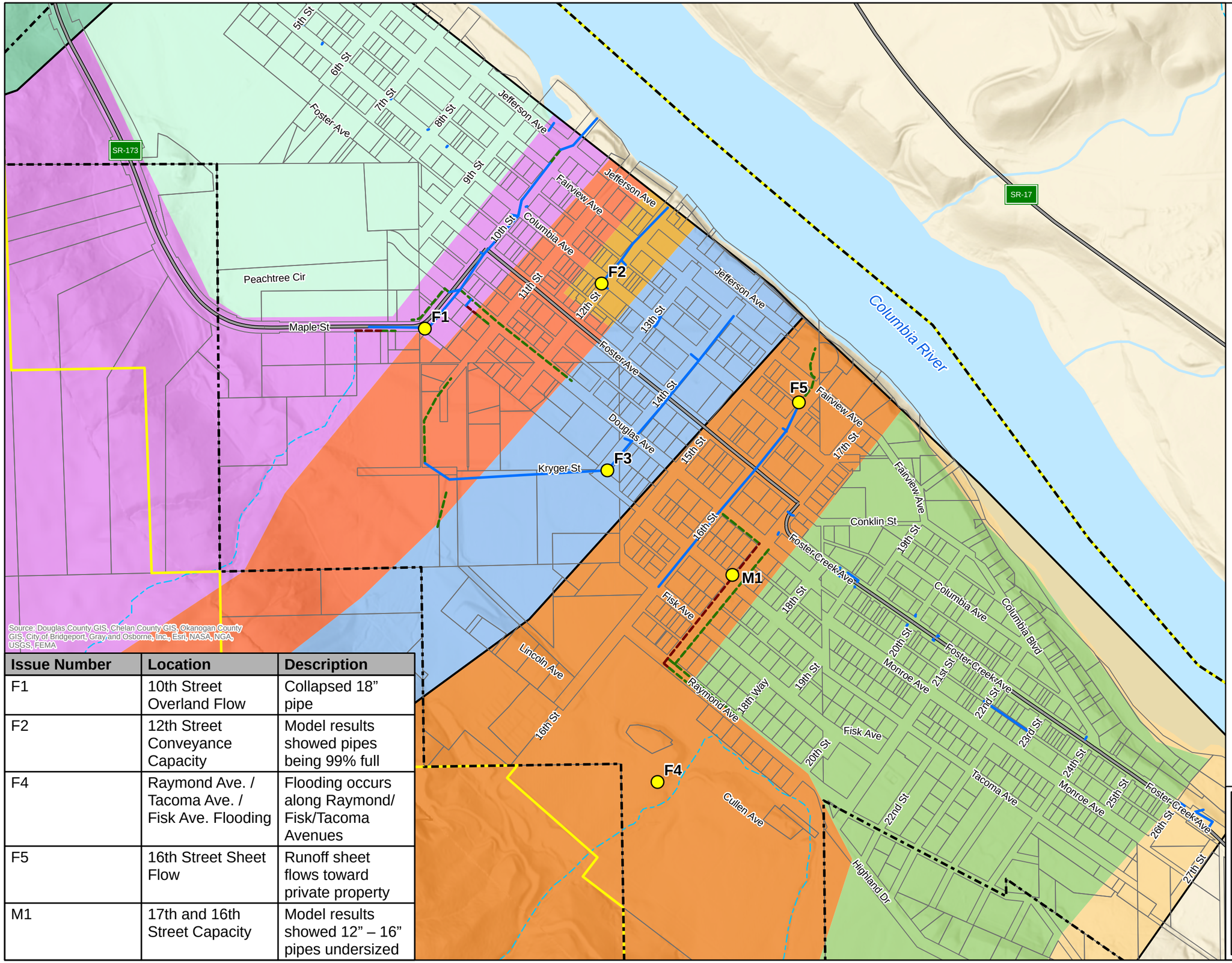
Potential Solutions

A potential solution to runoff from the hillside is to replace the damaged 18-inch pipe. This Plan assumes the existing pipe will be replaced with approximately 210 feet of new 18-inch diameter pipe to convey the 100-year storm event. However, City staff may want to camera the pipe to see the extent of the collapsed pipe. If minimal, there is a potential to replace only a segment of the pipe instead of the full 210 LF.

F1B: 10th Street Conveyance Undersized Pipes

Due to the change outlined for Project F1A, other 18-inch pipes in the 10th Street conveyance system downstream may have capacity issues after the damaged drainage pipe is fixed (see Figure 3-2). Under current conditions, it is estimated that these pipes are flowing at approximately 12 percent capacity whereas if the pipe were replaced, they are estimated to flow at approximately 110 percent capacity.

It is recommended that pipes in this run be upsized to handle a higher capacity. Approximately 755 feet of pipe should be upsized to 24-inch diameter pipe from Foster Avenue to Fairview Avenue in order to avoid additional capacity issues. After upsizing, the new system will flow at approximately 55 percent capacity. The slope of the new pipe should be 0.5 percent at a minimum.



Issue Number	Location	Description
F1	10th Street Overland Flow	Collapsed 18” pipe
F2	12th Street Conveyance Capacity	Model results showed pipes being 99% full
F4	Raymond Ave. / Tacoma Ave. / Fisk Ave. Flooding	Flooding occurs along Raymond/ Fisk/Tacoma Avenues
F5	16th Street Sheet Flow	Runoff sheet flows toward private property
M1	17th and 16th Street Capacity	Model results showed 12” – 16” pipes undersized

Stormwater Subbasins

- Basin 1
- Subbasin 2-10th
- Subbasin 2-11th
- Subbasin 2-12th
- Subbasin 2-14th
- Subbasin 2-Nth
- Subbasin 3-17th
- Subbasin 3-Nth
- Subbasin 3-Foster
- Storm Basins
- Identified Problems
- Stormwater Pipe
- Ditch
- Culvert

Reference

- Stream
- Intermittent Stream
- City Limits
- Urban Growth Area
- Parcel
- Surface Water

N

0 250 500 1,000 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 3-1

IDENTIFIED PROBLEMS

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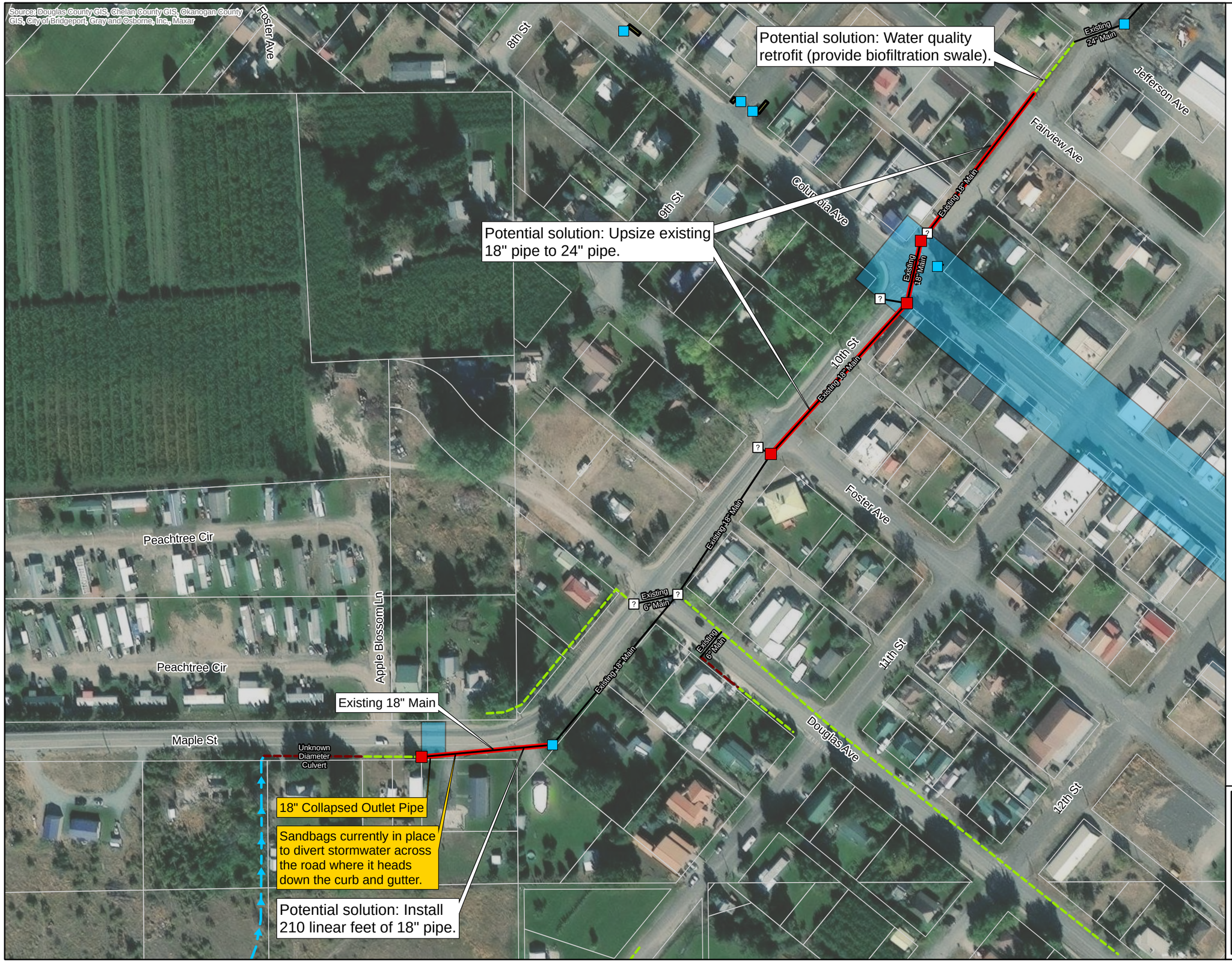

Potential Storm Features

- Potential Catch Basin
- Potential Storm Pipe

Existing Storm Features

- Type 1 Catch Basin
- Unknown Type Catch Basin
- Infiltration Chamber
- City Observed Flooding Area
- Existing Stormwater Pipe
- Ditch
- Culvert
- Intermittent Stream
- Parcel

N

0 50 100 200 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 3-2

FIELD ISSUE F1 - 10TH STREET OVERLAND FLOW

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It is also recommended that the City retrofit the ditch on the north side of 10th Street between Fairview and Jefferson Avenues into a bioswale for water quality treatment (see Figure 3-2). The existing ditch is approximately 110 feet long so it will need to be extended another 90 feet in the 10th Street right of way. The existing ditch may need to be modified so that it is at least three feet wide and three feet deep with a slope of 1.5 percent.

F2: 12th Street Conveyance Capacity

The conveyance for this area of Basin 2 runs down 12th Street to the Columbia River in a 10-inch diameter stormwater main (see Figure 3-3). The City had identified this area as having potential problems. However, according to the stormwater model, during a 100-year storm event under current conditions, this pipe is functioning at 99 percent capacity.

Potential Solutions

To alleviate concerns in the field, it is recommended that 665 feet of pipes in this run be upsized to 12-inch diameter with a 0.5 percent minimum slope to handle a higher capacity. After upsizing, the pipe is anticipated to be 73 percent full under future conditions.

In terms of water quality retrofit opportunities, since the 12th Street conveyance handles runoff for a smaller subbasin, there is not space available for a 200 linear foot bioswale. To provide water quality for this basin, it is recommended that the City evaluate proprietary water quality systems during the design phase.

F3: 14th Street Conveyance Pipe Potential Upsizing Capacity

Per field observation and information provided from the City, Basin 2-14th and Basin 2-11th share a drainage flow path. The upstream portion of this shared basin flows into a pond structure where it can infiltrate into the ground and overflow to the east toward 14th Street in an 18-inch pipe under the ballfield and school parking lot (see Figure 3-4). The pond also has a gate which can be opened manually when needed to divert runoff through a 36-inch diameter pipe toward 11th Street in high flow events.

If flow is not diverted to 11th Street, the stormwater model shows that the pipe to 14th Street is undersized for the future 100-year storm event, flowing at approximately 107 percent capacity. However, this issue is currently alleviated by the use of the gate which allows a diversion to 11th Street during high storm events.

Potential Solutions

The current diversion to 11th Street appears to be working well but as an option, approximately 1,035 LF 18-inch stormwater pipe conveying runoff to 14th Street could be upsized to a 24-inch pipe if there was ever a need to eliminate the diversion to 11th Street.

F4A: Raymond Avenue/Tacoma Avenue/Fisk Avenue Flooding

The City has noted that recent flooding occurs in the vicinity of Raymond and Fisk Avenues. These areas receive runoff from the hills in Basin 3. The stormwater runoff from Basin 3 flows down a series of check dams east of Lincoln Avenue and enters a dry well believed to be near Raymond Avenue in a residential back yard (see Figure 3-5). From here, it is presumed that there is an overflow pipe connected to the drywell that discharges flow into Raymond Avenue into a concrete outfall structure (Figure 3-6) where flow continues to the 17th and 16th Street stormwater conveyance systems, discharging into the Columbia River. The model for this subbasin stormwater system starts with this outfall structure in Raymond and assumes that all runoff from upstream is able to get into the conveyance system. Field observations have found that the check dams are currently silted in which is likely inhibiting their function. Likewise, it is presumed that the drywell and piping system toward Raymond Avenue are silted in and are not functioning.

FIGURE 3-6

Concrete Outfall on Raymond Avenue

Source: Douglas County GIS, Chelan County GIS, Okanogan County GIS, City of Bridgeport, Gray and Osborne, Inc., Maxar, Microsoft

Jefferson Ave

10th St

Existing 18" Main

Existing 18" Main

Existing 12" Main

Existing 18" Main

Columbia River

Potential Proprietary Water Quality Retrofit Facility

Fairview Ave

All pipe segments modeled as 99% full under existing conditions.

Existing 10" Main

Existing 10" Main

Jefferson Ave

Potential solution: Upsize existing 10" pipe to 663 linear feet of 12" pipe.

Existing 9.5" Main

11th St

Columbia Ave

12th St

Existing 12" Main

Foster Ave

13th St

Douglas Ave

Potential Storm Features

- Potential Catch Basin
- Potential Storm Pipe

Existing Storm Features

- Type 1 Catch Basin
- Unknown Type Catch Basin
- Drywell
- Existing Stormwater Pipe
- Ditch
- Parcel
- City Observed Flooding Area

N

0 50 100 200 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 3-3

FIELD ISSUE F2 - 12TH STREET CONVEYANCE CAPACITY

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Source: Douglas County GIS, Chelan County GIS, Okanogan County GIS, City of Bridgeport, Gray and Osborne, Inc., Maxar, Microsoft

11th St. 36" Outflow Pipe (Overflow Pipe) from the Concrete Diversion/Collection Structure

14th St. Outflow/Overflow Pipe from the Concrete Diversion/Collection Structure (exact location of pipe unknown until reaching the vicinity of CB-21A).

Existing 36" Main

Existing 18" Main

Existing 30" Main

Douglas Ave

14th St

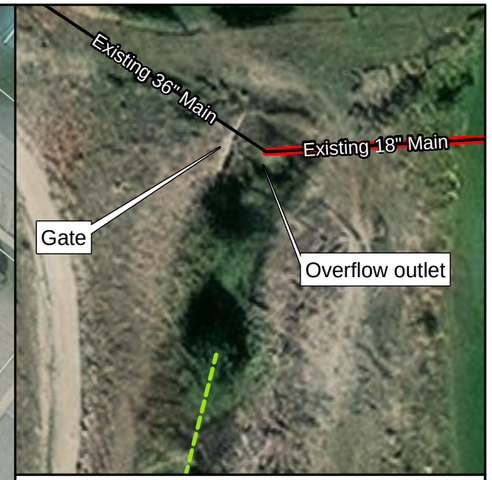
Kryger St

Tacoma Ave

When flows are low, runoff infiltrates into ground in the pond. When flows are high and the gate towards 11th St. is shut, pond fills up with water and overflows to 14th St. When gate is open, this opening becomes the primary outlet sending stormwater to 11th St.

City staff noted this area is not a current problem. However, when modeled, if all flow goes to 14th St. instead of 11th St., the pipes along 14th St. are undersized.

Potential solution: Upsize existing 18" pipe to 24" pipe.



Diversion Pond View

- Type 2 Catch Basin
- Potential Storm Pipe
- Existing Stormwater Pipe
- Ditch
- Parcel
- Pond
- Urban Growth Area

N

0 50 100 200 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 3-4

FIELD ISSUE F3 - 14TH STREET CONVEYANCE CAPACITY

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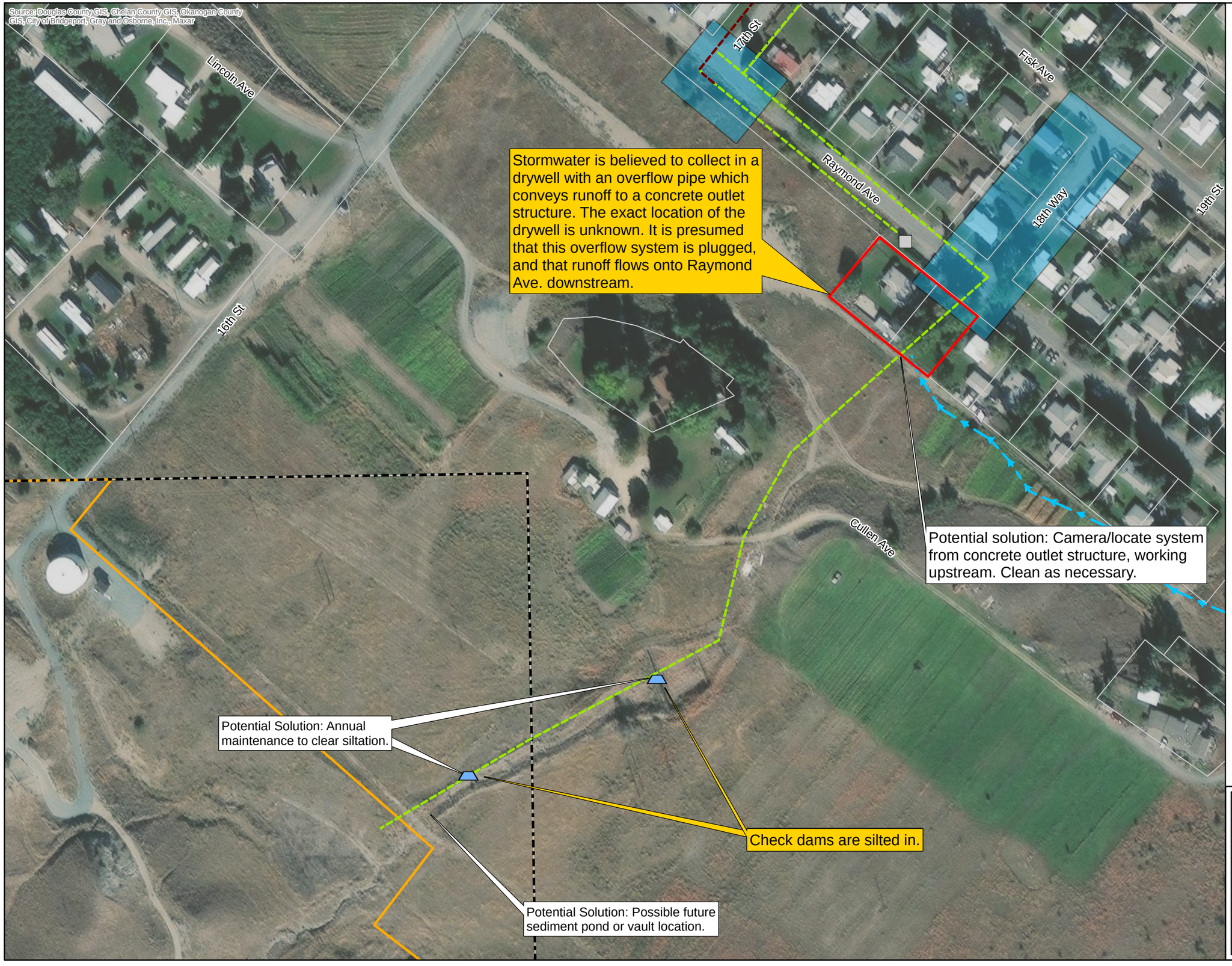

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 3-5

FIELD ISSUE F4 - RAYMOND/18TH/FISK AVENUE FLOODING

Gray & Osborne, Inc.
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Potential Solutions

It is recommended that excess silt be removed from the check dams and the dry well structure be located and cleaned. Check dams should be inspected yearly and/or after significant storm events. The Ecology manual recommends removing sediment when it reaches one half of the depth behind the dam. The drywell should also be inspected yearly for excess sediment and debris that may be blocking inlets and/or outlets.

It is also recommended that for a more permanent solution, a study be performed to evaluate the feasibility of a sedimentation basin near the city limits so as to capture excessive sediment upstream and to minimize the amount of annual sediment removal that needs to be done to the current infrastructure downstream.

F4B: Sediment Pond Feasibility Study

The City should perform a study to evaluate the feasibility of a permanent sediment pond or vault to capture sediment stormwater runoff transported from the uphill region. Pollutants can enter the Columbia River through transportation of contaminated sediments. Therefore, capturing sediment before it has the chance to enter the river has a positive impact of the river's water quality.

In order to size a sediment detention basin or a debris basin, it would be helpful to have an understanding of the sediment yield from the contributing drainage area. Sediment may be delivered by a variety of mechanisms including: (1) eroded soil transported during small to moderate magnitude runoff events; or (2) larger events such as debris flows. A suite of factors influence the type of erosion that contributes to a watershed's sediment yield including watershed morphometric characteristics, climate, geology, soil, vegetation, land use, and wildfire. Sediment yield could then be estimated once the mechanism of erosion and sediment delivery of concern is known. If soil erosion is the primary mechanism of sediment transport, then soil erosion models could be used to estimate sediment yield. Alternatively, if debris flows are the primary concern, then debris flow models could be used to estimate sediment yield. Assuming that the drainage is ephemeral and that it is not gaged, then a hydrologic model would need to be used to compute the design flow. From there, a pond may be appropriately sized and a cost estimate would be prepared. The project description and cost estimate would be provided within a feasibility study so that City staff may review future funding opportunities.

F5: 16th Street Sheet Flow

According to field observation, stormwater from the 16th Street drainage system discharges from an underground 15-inch pipe at the northwest corner of 16th Street and Fairview Avenue. The field observation noted that from this point, the runoff is uncontrolled, sheet flowing over private property as well as over Fairview Avenue on its way to the Columbia River (see Figure 3-7).

Potential Solutions

It is recommended that the uncontrolled runoff be collected and conveyed in approximately 415 linear feet of 36-inch pipe towards the river rather than be allowed to sheet flow overland. A portion of the new pipe can be directed to flow through City-owned property; however, this solution will require easements as the property is surrounded by private land.

MODEL IDENTIFIED PROBLEMS

In reviewing the field identified issues, these select areas of the City's current stormwater system were modeled using the XPStorm software. An SCS Type 1A storm was utilized and as noted in Chapter 2, a precipitation amount of 2 inches was used for both the existing and future 25-year, 24-hour storm and 2.5 inches was utilized for the existing and future 100-year, 24-hour storm events. To account for future climate change, these rainfall amounts were increased by 9 percent. Future impervious coverage assumes an increase based on potential future development as shown in Figure 3-1.

The results of the select modeling showed that both the 16th Street and 17th Street conveyance systems were undersized. The following describes the issue in greater detail.

M1: 17th Street and 16th Street Capacity

The stormwater model found that the stormwater system is lacking capacity for the future 100-year storm in the 15-inch diameter pipes shown in Figure 3-8. This system currently is flowing at approximately 108 percent capacity.

Potential Solutions

To reduce flooding, it is recommended that 1,900 linear feet of pipes be upsized from 15-inch diameter to 24-inch diameter pipe. After upsizing, the pipes are estimated to flow at approximately 50 percent capacity under future conditions.

This area also presents a water quality retrofit opportunity. It is recommended the City retrofit the ditch between 16th Street and 17th Street along Douglas Avenue to a bioswale for water quality treatment at the end of this pipe. The bioswale will need to be, at a minimum, 200 linear feet long, 3 feet wide and 3 feet deep with a slope of 1.5 percent.

ISSUE CLASSIFICATION

The problems identified above were compiled and ranked as low, medium, or high priority as shown in Table 3-2. Most of these projects address flooding issues while also incorporating water quality treatment in areas that are currently lacking facilities.

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 3-7

FIELD ISSUE F5 - 16TH STREET SHEET FLOW

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Source: Douglas County GIS, Chelan County GIS, Okanogan County GIS, City of Bridgeport, Gray and Osborne, Inc., Maxar, Microsoft

Columbia River

14th St

Existing 24" Main

15th St

Columbia Ave

16th St

Fairview Ave

Existing 16" Main

Potential solution: 420 linear feet of new 36" pipe.

Foster Ave

Existing 12" Main

16th St

Existing 16" Main

Potential solution: 1,900 linear feet of 24" pipe replacement.

Retrofit approximately 200 linear feet of this ditch to a bioswale.

These pipes are undersized for the future 100-year storm event.

Douglas Ave

17th St

Conklin St

Foster Creek Ave

19th St

Tacoma Ave

18th St

19th St

Monroe Ave

Raymond Ave

Fisk Ave

19th St

20th St

Potential Storm Features

- Potential Catch Basin
- Potential Storm Pipe

Existing Storm Features

- Type 1 Catch Basin
- Unknown Type Catch Basin
- Drywell
- Existing Stormwater Pipe
- Culvert
- Ditch
- Local Flow Direction
- Infiltration Chambers
- Parcel

N

0 50 100 200 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 3-8

MODEL ISSUE M1 - 16TH AND 17TH STREET CAPACITY ISSUES

Gray & Osborne, Inc.
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TABLE 3-2

Identified Problems

Issue Number	Location	Description	Priority
F1	10th Street Overland Flow	Collapsed 18-inch pipe; Potentially replace 210 LF 18-inch pipe and upsize 755 LF 18-inch downstream pipe with 24-inch pipe; Retrofit 200 LF of ditch into a bioswale.	High
F2	12th Street Conveyance Capacity	Model results showed pipes being 99 percent full; Upsize 665 LF of 10-inch pipe to 12-inch pipe	Low
F4	Raymond Avenue/Tacoma Avenue/ Fisk Avenue Flooding	Flooding occurs along Raymond/Fisk/Tacoma Avenues; Remove excess silt from check dams and dry well system and/or provide sediment pond upstream	High
F5	16th Street Sheet Flow	Runoff sheet flows toward private property; Install 415 LF of 36-inch pipe toward Columbia River and/or install water quality treatment via 200 LF bioswale	Medium
M1	17th and 16th Street Capacity	Model results showed 12-inch – 16-inch pipes undersized; Upsize 1,900 LF of 16-inch pipe to 24-inch pipe and retrofit 200 LF of ditch into a bioswale	Medium

CHAPTER 4

WATER QUALITY

This City of Bridgeport is situated on the Columbia River so protecting the river from harmful pollutants is a goal of the City Council and the citizens that live in the region. Currently, The Columbia River Lake Pateros section downstream of the Chief Joseph Dam is listed as a Category 5 (or impaired water body) for DDD (dichlorodiphenyldichloroethane), DDE (dichlorodiphenyldichloroethylene), PCBs (polychlorinated biphenyls) and Methyl Mercury per the 303(d)/303(b) list. In Washington State, protection is provided by water quality standards which are established by WAC 173-201A and are enforced by the Department of Ecology. The standards are based on two objectives: protection of public health and enjoyment, and protection of fish, shellfish, and wildlife. For each surface water body in the State, the standards assign specific beneficial uses such as aquatic life, recreation, or water supply. Water quality standards have been developed for each use for parameters such as fecal coliform, dissolved oxygen, temperature, pH, turbidity, and toxic, radioactive, and other harmful substances. The surface water criteria include 29 toxic substances, including ammonia, residual chlorine, several heavy metals, polychlorinated biphenyls (PCBs), and pesticides. A list of typical pollution parameters and their potential impacts on water quality is provided in Table 4-1.

TABLE 4-1

Pollutant Sources and Impacts

Pollutant (example)	Sources/Causes	Impacts
Low Dissolved Oxygen	Increased temperatures, organic wastes.	Low oxygen levels put stress on aquatic organisms and can lead to fish kills and reduction in aesthetic values.
High pH	Pouring, finishing, and washing cement concrete.	Changes in pH affect the toxicity, reactivity, and solubility of many compounds.
Increased Temperature	Removal of riparian vegetation that provide shade. Erosion of banks widening and making water body shallower.	Reduced solubility of oxygen.
Turbidity	Exposed erodible soils.	Reduced availability of light to plants for photosynthesis.

TABLE 4-1 – (continued)

Pollutant Sources and Impacts

Pollutant (example)	Sources/Causes	Impacts
Nutrients (nitrogen, phosphorous)	Organic decomposition of soil erosion, detergents, fertilizers, septic system effluent, livestock manure.	Algae blooms causing dissolved oxygen levels to drop.
Pathogens/Bacteria	Leaking septic systems or sanitary sewer, pet and livestock waste.	Waterborne illness.
Oil and Grease	Runoff from roadways, parking lots, and industrial property.	Hydrocarbon compounds can be toxic to aquatic life at low concentrations.
Total Suspended Solids (TSS)	Soil erosion, runoff from paved areas, and scour within a stream.	Inhibit oxygen exchange in gills of aquatic organisms, and may settle out and smother bottom-dwelling organisms.
Heavy Metals	Runoff from roadways, parking areas, and industrial property.	Changes in pH can increase solubility of accumulated metals making them available for ingestion by fish and insects.
Toxic Organic Compounds (dioxin, dieldrin, polychlorinated biphenyls)	Urban and agricultural runoff, hazardous substance spills, improper disposal of waste products, and industrial discharges.	Availability of toxic organic compounds to aquatic life is difficult to determine because of their adsorption to particulate matter.
Organic Material	Yard waste and soil erosion.	Decreased dissolved oxygen concentrations.

Water quality standards for the Columbia River can be found in the Washington Administrative Code (WAC) Section 173-201A. Per the WAC the Temperature Criteria for the Columbia River is:

> *Temperature shall not exceed a 1-day maximum (1-DMax) of 20.0°C due to human activities. When natural conditions exceed a 1-DMax of 20.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed 0.3°C due to any single source or 1.1°C due to all such activities combined. Dissolved oxygen shall exceed 90 percent of saturation.*

The criteria for pH is:

> *pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units.*

The criteria for E. coli is:

> *E. coli organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10 percent of all samples (or any single sample when less than 10 sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 mL.*

The criteria for turbidity is:

> *Turbidity shall not exceed: 10 NTU over background when the background is 50 NTU or less; or a 20 percent increase in turbidity when the background turbidity is more than 50 NTU.*

POTENTIAL SOLUTIONS

Continued education efforts on ways the community can help reduce pollutants, as well as inspections of public and private facilities, will aid in protecting the quality of surface waters in the City of Bridgeport. Source control inspections at local businesses would be a helpful way to address water quality related issues at the origin of the problem. Additionally, installing water quality treatment facilities, where feasible, will further improve the effectiveness of the City's storm system to improve water quality. Potential solutions to water quality related issues are listed in Table 4-2, and specific structural water quality measures that may be constructed alone or as part of transportation related projects are described in Table 4-3. Water quality improvement efforts should be planned and implemented as the opportunity allows. Chapter 6 discusses specific water quality measures the City can plan for in the next 20 years.

TABLE 4-2

Potential Solutions for Pollutant Sources

Pollutant	Potential Solution
Low Dissolved Oxygen	• Increased stream buffers. • Riparian restoration.
High pH	• Business source control inspections. • Implementation of pH control measures on construction sites
Increased Temperature	• Increased stream buffers. • Riparian restoration. • Education of property owners about restoring vegetation along streams.
Turbidity	• Installation of structural control measures such as detention ponds and emerging technologies such as filters to help settle out sediment that carries pollutants (see Table 2-3). • City inspections and enforcement during construction projects.
Nutrients (nitrogen, phosphorous)	• Education of property owners to reduce use of fertilizers.
Pathogens/Bacteria	• Conduct DNA testing to determine the source of bacteria in receiving waters, then customize remedial action. • Provide pet waste stations at City parks. • Provide education to citizens on the importance of disposing of pet waste properly.
Oil and Grease	• Conduct business source control inspections and provide education/enforcement on appropriate controls to aid in preventing spills. • City-wide program such as a “Don’t Drip and Drive” campaign to educate citizens on repairing leaking cars. • Install structural controls such as oil/water separators (see Table 4-3).
Total Suspended Solids (TSS)	• Install structural controls such as detention ponds and emerging technologies including water quality filters to help settle out pollutant-laden sediment (see Table 2-3).
Heavy Metals	• Conduct business source control inspections and provide education/enforcement on appropriate BMPs to aid in preventing metals mixing with runoff. • Provide general education on preventing metals through such items as general car maintenance (i.e., brake pads). • City street sweeping program. • Structural controls (see Table 2-3).

TABLE 4-2 – (continued)

Potential Solutions for Pollutant Sources

Pollutant	Potential Solution
Toxic Organic Compounds (dioxin, dieldrin, polychlorinated biphenyls)	• Conduct business source control inspections, provide education or enforcement on appropriate measures to prevent metals from mixing with runoff. • Provide general education to residential and agricultural property owners about the use of pesticides. • Provide general education on preventing spills and not dumping waste into catch basins. • Label stormwater catch basins ("No dumping") • Structural controls (see Table 2-3).
Organic Material	• Education of private property owners on proper disposal locations for yard waste.

TABLE 4-3

Potential Structural Related Water Quality Tools

Facility	Description	Benefits
Biofiltration Swale	A shallow ditch, mild side slopes, and thick vegetation	Thick vegetation provides soil stabilization, stormwater treatment, and nutrient uptake.
Filter Strip	A strip of vegetated land for sheet flow	Easy maintenance, provides basic level of treatment.
Bioretention Facility	A shallow depression with deep rooted vegetation	Vegetation provides soil stabilization, nutrient uptake, and aesthetics. Engineered soil mix increases treatment and filtration.
Wetpools	A wetpond, wet tank/vault, or wetland that maintains a permanent pool of water	Stormwater treatment through gravity settling and biological uptake of algae and microorganisms.
Media Filtration	Pond or vault with engineered sand/soil mix or Ecology approved media filtration devices.	High level of treatment. High level of maintenance is typically needed.
Oil/Water Separators	Can be a hooded catch basin insert or coalescing plate separator	Retain oil to prevent migration downstream. Require regular maintenance for proper operation.
Regional Treatment Facilities	Large containment area for high volumes of runoff, typically incorporating detention and biofiltration or media filtration	Provide high levels of treatment to large basins. Regular maintenance is required.

CHAPTER 5

OPERATION AND MAINTENANCE

The following sections summarize considerations for the maintenance of facilities described in Chapter 2 as we well as the control of stormwater pollution from the sources identified in Chapters 4. A detailed water quality BMP Operation and Maintenance Manual can be found in Appendix A.

FACILITY OPERATION AND MAINTENANCE PROGRAM

The objective of a stormwater maintenance program is to assure the continued functioning of stormwater management facilities. A complete maintenance program includes more than the physical tasks of cleaning catch basins, pipes, and open ditches; maintenance of vegetation in biological treatment structures; and proper disposal of debris from the maintenance activities. Maintenance programs also involve management items such as completing and maintaining a facilities inventory, updating a base map, scheduling inspections and maintenance activities, assessing costs for contract maintenance versus staff maintenance, and record keeping.

In order to perform inspections and maintenance at the appropriate times, a budget, staff, and priority schedule needs to be established. Certain types of maintenance are more important than others. It is important that catch basins and conveyance facilities be inspected before the wet season and after the spring snowmelt to assure that debris has not blocked a channel or taken up capacity in a manhole. Street sweeping in the fall is important because leaves block catch basin grates, which could result in overland flow across private property or flooding of roadways. Street sweeping in the spring is important as well since sand used in snow control can fill catch basins and pipes, clog infiltration facilities, or be transported downstream to the Columbia River.

Reports and record keeping are important feedback mechanisms that enable management to compare actual versus planned costs, production, and efficiency. Reports provide a database for improved budgeting and resource allocation. Records and reports should include personnel hours, equipment hours, materials used, and the unit of work completed.

Maintenance control establishes accountability for specific results within a specific timeframe and budget. The maintenance program needs a control hierarchy to establish a chain of command to complete the work.

The proper operation and maintenance of stormwater facilities benefits the public as a whole; therefore, the City should utilize innovative solutions to accomplish the goals of stormwater management in those cases where a private entity will not maintain its

facility. The City should obtain easements for all portions of the stormwater system that lie outside of the right-of-way for which it will provide maintenance.

MAINTENANCE STANDARDS

Appendix 5-A of the 2019 Washington State Department of Ecology *Stormwater Management Manual for Eastern Washington* identifies maintenance standards for flow control, conveyance, and water quality facilities that should be established by the City.

The following is a brief description of the recommended maintenance procedures and the impact on stormwater pollution that could result from not maintaining the facility. Appendix A contains complete descriptions of maintenance activities the City may need to complete.

STREET SWEEPING OR WASHING

Streets with concrete curb and gutter or thickened edges are part of the stormwater conveyance system. All streets accumulate vehicular emission particles, silt, and leaves and other debris and pollutants that could enter the stormwater conveyance system. Street sweeping or washing is an important maintenance item to reduce pollution in the receiving waters and to reduce the potential for blocking of the conveyance system. If street washing is used, filter fabric should be placed temporarily over downstream catch basins or ditch inlets to prevent introduction of debris or pollutants into the drainage system. It is recommended the City implement a street sweeping program based upon sweeping three times per year.

CATCH BASIN CLEANING

The City has approximately 67 identified storm drainage catch basin structures, including types with and without sumps. Sumps are important features that allow deposition of particulate matter carried in the stormwater. When sumps become filled to 60 percent of their volume, the efficiency of silt removal diminishes significantly. Maintenance is recommended when the sediment exceeds this 60 percent threshold. Catch basins are typically cleaned with a vactor truck that removes the sediment from the basin. This sediment must be disposed of properly at an appropriate disposal site.

PIPE CLEANING

The City has approximately 71 identified stormwater pipes. Pipes in the City vary in size from 6 to 36 inches in diameter. Pipe types include concrete, corrugated metal, and HDPE. It is recommended that storm drain pipes be cleaned on a 3- to 5-year rotating basis. The primary maintenance activity for stormwater pipes is removal of accumulated sediment once the sediment or debris exceeds 20 percent of the diameter of the pipe. Sediment can decrease conveyance capacity or can be washed out of the pipes during storm events causing downstream sediment and pollution problems. A vacuum system is

recommended for cleaning. If pipe flushing is used, adequate downstream siltation control must be in place prior to flushing.

The City currently cleans stormwater catch basins and pipes on a 5-year rotating basis using a rental vac truck and a crew of three. It takes the City approximately 3 days of work to clean all catch basins.

PIPE INSPECTION

In order to assess the condition of the City's pipe network, a television inspection program is recommended. This program would require the City to contract with a television inspection company. It is recommended that television inspections be completed following pipe cleaning to ensure that pipes are clean enough to inspect and that any defects within the pipe will be visible. Each pipe should be inspected once every 10 years to identify structural deficiencies as they arise. Television inspection can also be conducted if the City notices any particular areas that suddenly fail to drain, which could indicate a collapsed or blocked pipe.

OPEN DITCH MOWING AND CLEANING

Ditches and swales can provide biofiltration, if vegetation is allowed to remain within the channel and on the sides. The primary pollutant removal mechanism of a bioswale (or ditch) involves filtration by grass blades, which enhance sedimentation, as well as trapping and adhesion of pollutants to the grass and thatch. To be most effective, the vegetation within the ditch should be cut down to a height of between 2 and 6 inches. Mowing is the first method that should be used to reduce capacity loss. If the ditch must be reshaped to promote drainage or remove excess materials, the work should be performed during dry weather.

Swales can be cleaned with a backhoe, taking care not to remove more material than is necessary. Only areas where there is a flow restriction should be cleaned. Small amounts of sediment should be removed by hand.

LOW IMPACT DEVELOPMENT METHODS

Many low impact development methods require maintenance similar to traditional stormwater management facilities. Bioretention ponds generally require vegetation management such as weeding, mulching, trimming and removal of dead vegetation, similar to ditches and swales. Depending on the types of vegetation installed in the bioretention ponds, the level of required maintenance may be slightly higher. The City may desire to choose plants with lower maintenance requirements, in consultation with a landscaping expert.

Permeable pavement generally requires increased maintenance as compared with traditional pavement. Because the surface of the pavement is constructed to allow stormwater to filter through to the subgrade, the pavement must be washed regularly in order to prevent clogging due to sediment or moss growth. The level of maintenance required is site-specific, but pressure washing may be required once or several times per year in order to maintain the efficacy of the pavement.

RECOMMENDED MAINTENANCE PROGRAM

The types and quantities of stormwater facilities the City must maintain are shown in Table 5-1.

The stormwater maintenance activities anticipated by City staff and the corresponding production units, estimated personnel hours, and estimated labor costs are shown in Table 5-2. This information is used to estimate the cost of the stormwater maintenance program and estimate the staff required to implement the program. It has been assumed that all maintenance activities will be completed by City staff and that the cost to the City per manhour is an average of $50.

TABLE 5-1

Annual Operation and Maintenance Expense

Activity Description	Total Units in System	Unit	Activity Period	Frequency (Times/Yr)	Time/Unit (Hours)	No. of Personnel	Time/Year for Staff (Hours)	Annual Staff Cost	Daily Equipment Production Rate (/day)	Equipment	Equipment (hours/year)	Annual Equipment Cost	Combined Total Cost	Comments
Structures														
Inspect Catch Basin/Manhole	67	EA	50% Every year	0.50	0.08	2	5	$268	NA	NA	NA	$0	$268	Inspects about 50% of the entire system every year to mark for maintenance. The entire system will be inspected at least every two years
Clean Catch Basin/Manhole	67	EA	50% Every year	0.50	0.37	3	37	$1,859	30	Vactor Truck	9	$241	$2,100	About 50% of the system is cleaned every year via vactor/washing/clearing. The NPDES permit requires the system to be cleaned every two years. At a minimum, the entire system will be cleaned at least every two years
Minor Repairs to Catch Basin/Manhole	1	City-wide	As needed	1	30	2	60	$3,000	NA	NA	NA	$0	$3,000	Adjust frame/grates, repair broken structures, incl. traffic control
Pipes														
Pipe Jetting	9,840	LF	Once every 5 years	0.2	0.02	3	118	$5,904	6400	Pipe Jetting Equipment, Vactor truck	2	$133	$6,037	Jetting in advance of CCTV. Jet 1/5 annually at 800 LF per hour
CCTV Pipe Condition Assessment	9,840	LF	Once every 10 years	0.1	0.03	3	89	$4,428	6400	Camera Truck	1	$12	$4,440	Detailed CCTV evaluation. TV 1/10 annually at 800 LF per hour
CCTV Pipe Review and Prioritization	1	Monthly Review	Monthly	12	8	1	96	$4,800	NA	NA	NA	$0	$4,800	View and interpret CCTV footage, document, issue work orders and follow-up (1 day/month)
Outfall Inspection	11	EA	Annually	1	0.5	2	11	$550	NA	NA	NA	$0	$550	
Repair Pipe Blockage	1	City-wide	As needed	1	40	2.5	100	$5,000	40	Backhoe	40	$160	$5,160	Clear pipes of roots, sediment, debris and replace damaged sections, incl. traffic control
Swales														
Swale Maintenance	6,950	LF	Biannually	0.5	0.01	2	70	$3,475	800	Mower	35	$209	$3,684	Mow twice a year at 100 LF per hour. Mowing would include the top, side slopes, and bottom of the swale during the growing season.
Swale Cleaning & Repair	6,950	LF	Once every 5 years	0.2	0.02	2	56	$2,780	400	Backhoe	28	$111	$2,891	Excavator to remove sediment/reshape swales at 50 LF per hour once every five years
Flow Control/Water Quality Facilities														
Stormwater Facility Inspection	2	EA	Annually	1	1.5	1.5	5	$225	NA	NA	NA	$0	$225	Public systems only. Includes vaults and ponds.
Stormwater Facility Mowing	2	EA	Biannually	2	2	4	32	$1,600	3	Mower	11	$64	$1,664	Mow each facility 2 times per year. Only includes ponds
Stormwater Facility Noxious Weed Removal	2	City-wide	Biannually	2	30	1	120	$6,000	60	Backhoe	60	$240	$6,240	Remove any noxious weeds within the proximity of any stormwater facility
Stormwater Facility Repair	2	EA	Once every 5 years	0.2	4	4	6	$320	NA	NA	NA	$0	$320	Repair 1/5 each year – 4 hours per each facility. Includes Vaults and Ponds
Stormwater Facility Vegetation Removal	2	EA	Annually	1	1	4	8	$400	NA	NA	NA	$0	$400	Removal of vegetation at all public stormwater ponds

TABLE 5-1 – (continued)

Annual Operation and Maintenance Expense

Activity Description	Total Units in System	Unit	Activity Period	Frequency (Times/Yr)	Time/Unit (Hours)	No. of Personnel	Time/Year for Staff (Hours)	Annual Staff Cost	Daily Equipment Production Rate (/day)	Equipment	Equipment (hours/year)	Annual Equipment Cost	Combined Total Cost	Comments
Stormwater Facility Cleaning (sedimentation/debris removal)	2	EA	Once every 5 years	0.2	8	3	10	$480	4	Backhoe	4	$16	$496	Removal of sediment/debris at all public stormwater ponds
Vault/Tank Inspection	19	EA	Once every 2 years	0.5	0.5	2	10	$475	NA	NA	NA	$0	$475	Inspection of vaults/tanks every 2 years
Vault/Tank Cleaning	19	EA	Once every 5 years	0.2	14	3	160	$7,980	NA	NA	NA	$0	$7,980	Cleaning of vaults/tanks every 5 years
Miscellaneous														
Street Sweeping	1	City-wide	Triannually (3-times a year)	3	60	1	180	$9,000	180	Sweeper	180	$4,320	$13,320	Arterials are swept once a month and residential streets are swept 2 times a year.
Sweeper Maintenance	1	EA	Monthly	12	6	1.5	108	$5,400	NA	NA	NA	$0	$5,400	One sweeper requires monthly maintenance
Vactor Maintenance	0	EA	Monthly	12	2	1	0	$0	NA	NA	NA	$0	$0	
Utility Locates	0	City-wide	Daily - as requested	60	2	1	0	$0	NA	NA	NA	$0	$0	Approximately 10 percent of total City utility locator time
Total Maintenance Hours Required							1279	$63,950				$5,506	$69,450	
Total Full-Time Operations and Maintenance Staff Required (based on **2,080** hours of work per year per person)							0.6						$70,000	
Current Full-Time Storm Operations and Maintenance Staff							-							
Current Full-Time Storm Operations and Maintenance Staff Deficit							-							

STAFF REQUIREMENTS

The total City staff hours required annually for the maintenance activities identified in Table 5-1 is 1279 hours, or approximately 0.6 FTE.

INSPECTIONS

The City should inspect all municipally owned stormwater facilities once every two years, unless there are maintenance records to support a different frequency. Reducing the inspection frequency should be based on records of double the length of time proposed for inspection frequency. Repair or maintenance actions should be performed in accordance with established maintenance standards.

All catch basins and inlets should be cleaned as needed based upon the inspection, assuming that most catch basins will be cleaned within a 2-year period. They should be cleaned to comply with established maintenance standards if inspections indicate a need. The decant water generated from catch basin cleaning must be disposed of properly.

STAFF TRAINING

As discussed previously in this chapter, the City should develop and implement an ongoing training program for City employees with responsibility for monitoring construction and whose operation and maintenance (O&M) job functions may impact stormwater quality. This program should address the importance of protecting water quality, stormwater regulatory standards for surface water and foundation drains, O&M standards, inspection procedures, BMP and LID technique selection, ways to perform job activities to prevent impacts to water quality, and procedures for reporting water quality concerns.

Administrative staff should receive training on plan review requirements and ensuring adequate erosion and sediment control and stormwater control elements are included in development plans.

The City should also ensure that staff is well trained on how to inspect and maintain best management stormwater practices. At a minimum, staff should be educated on how to maintain catch basins and drywells, bioswales and ditches, and any other best management practices implemented within the City. Staff shall also be knowledgeable in identifying pollutant sources and in understanding pollutant control measures, spill response procedures, and environmentally acceptable material handling practices. The *Illicit Connection and Illicit Discharge (IC-ID) Field Screening and Source Tracing Guidance Manual* shall be used as guidance for how to find and address pollutants in the field. In addition, the following training on the Washington Stormwater Center's website may be used as a training reference: https://www.youtube.com/playlist?list=PLXny_Je3KsDwN5iiiLJI9265_piHccImV. Renewal training for all employees on a biannual basis is recommended.

Personnel should also be well trained on sediment and erosion control issues so they can properly investigate and advise contractors regarding problem areas during construction. A staff member should be certified through the "CESCL: Stormwater BMPs for Construction" class offered by the Associated General Contractors of Washington Education Foundation or an approved equivalent. Equivalent certificates can be found on the following Ecology website: https://ecology.wa.gov/regulations-permits/permits-certifications/certified-erosion-sediment-control.

Erosion and sediment control certification for staff members should be renewed every 3 years.

ENFORCEMENT

Staffing levels should be sufficient to monitor construction activity, respond to stormwater complaints, and provide periodic inspection of stormwater facilities. City staff should document the hours spent performing site inspections, together with the frequency of inspection of construction sites and stormwater facilities. From these records and the records of time spent responding to complaints, an understanding of the adequacy of the current staffing level can be gained.

PUBLIC EDUCATION AND OUTREACH

An important element of stormwater management planning is public education and outreach. The involvement of the public is necessary to ensure the overall success of the stormwater management plan. For the public to be motivated to participate in stormwater management, it must first be aware of existing stormwater and surface water problems, the public's role in creating these problems, and actions to avoid and correct them.

The public must also be aware of how their normal activities affect stormwater quality and quantity. Most citizens believe that stormwater management is someone else's problem. In order to educate the public, issues with local relevance must be identified and programs must be designed to address them. The following is the outline of a public education and outreach program.

BEST MANAGEMENT PRACTICES

In most communities, a major source of stormwater contamination comes from sources that are lumped together and called non-point pollution. Non-point pollution sources can generally be defined as "pollution that does not have a single point of discharge." Non-point pollution discharges can be divided into commercial and residential categories.

The treatment of stormwater runoff prior to discharge to surface water or prevention of non-point pollution in stormwater should be accomplished by using best management practices (BMPs). BMPs are defined as physical, structural, and/or managerial practices, which when used singly or in combination, prevent or reduce pollution of water.

The Ecology Manual contains BMPs for urban land uses. BMPs can be placed into two general groups: source control BMPs and runoff treatment BMPs. The former group includes those BMPs that keep pollutants from coming in contact with stormwater; the latter group consists of methods for treating stormwater. Source control BMPs are preferred as they are generally less expensive and frequently are more effective.

BMPs and general strategies for their use in commercial and industrial applications are listed below in order of preference:

1. **Alter the Activity:** The preferred option is to alter any practice that may contaminate surface water or groundwater by either not producing the pollutant to begin with or by controlling it in such a way as to keep it out of the environment. An example would be recycling used oil rather than dumping it down a storm drain.

2. **Enclose the Activity:** If the practice cannot be altered, it should be enclosed in a building. Enclosure accomplishes two things. It keeps rain from coming into contact with the activity and since drains inside a building must discharge to sanitary or process wastewater sewers or a dead-end sump, any contamination of runoff is avoided.

3. **Cover the Activity:** Placing the activity inside a building may be infeasible or prohibitively expensive. A less expensive structure with only a roof may be effective, although it may not keep out all precipitation. Internal drains must be connected to the sanitary sewer to collect water used to wash down the area as well as any rain that may enter along the perimeter.

4. **Segregate the Activity:** Segregating an activity that generates more pollutants than other activities may lower the cost of enclosure or covering to a reasonable level.

5. **Discharge Stormwater to the Process Wastewater Treatment System:** Many industries have their own process wastewater treatment system with final disposal directly to the receiving water.

6. **Discharge Small, High-Frequency Storms to Public Sanitary Sewer:** This BMP would be limited to those few outside activities that contribute unusually high concentrations of pollutants and/or pollutants of unusual

concern. Limited entry of these few special cases may not overtax the public sanitary sewer.

The entry of stormwater to the sanitary or combined sewer can be limited to the small high-frequency storms that carry off the majority of pollutants over time. Storm flows in excess of the hydraulic capacity of the sanitary or combined sewer would be discharged to the storm drain.

7. **Discharge Small, High-Frequency Storms to a Dead-End Sump:** This BMP would be limited to those few activities that contribute unusually high concentrations of pollutants and/or pollutants of unusual concern. This option would be used when discharge into a sanitary sewer or process wastewater treatment is not available or feasible. This option requires the capacity to pump out the sump regularly and to dispose of the pumpage in an appropriate manner.

8. **Treat the Stormwater with a Stormwater Treatment BMP:** The treatment of stormwater is the least-preferred option for several reasons. Source control BMPs keep the pollutants completely away from stormwater. In contrast, stormwater treatment devices are not 100 percent effective. In fact, a highly effective BMP is considered successful if 80 percent of the pollutants are removed. Even after treatment, freshwater criteria may not be met for commercial areas.

Given the above strategies for use of BMPs, Ecology has developed mandatory BMPs for many types of pollutant sources. Appendix 8-A of the 2019 Ecology Manual lists each group of business in the following way:

- Title of business group;
- Standard Industrial Code (SIC);
- Description of business activities; and
- Potential pollution-generating sources.

Chapter 8 of the 2019 Ecology Manual lists applicable operational and structural source control and treatment BMPs for each type of pollutant source. Any stormwater treatment BMPs required can be found in Chapter 5 of the 2019 Ecology Manual. Ecology recommends implementing oil control measures for "high use areas." These areas include:

- An area of a commercial or industrial site subject to an expected average daily traffic count equal to or greater than 100 vehicles per 1,000 square feet of gross building area.

- An area of a commercial or industrial site subject to parking, storage, or maintenance of 25 or more diesel vehicles that are over 10 tons gross weight.

Providing treatment under the oil control menu is provided in Chapter 5 of the 2019 Ecology Manual. It is not anticipated that the commercial or industrial areas within the City exceed these thresholds at this time. Regardless, the City should keep these guidelines in mind when future development occurs.

CHAPTER 6

IMPLEMENTATION PLAN

INTRODUCTION

The City of Bridgeport's Stormwater Implementation Plan consists of a Capital Improvement Plan (CIP), an operations and maintenance program, guidelines to fund the CIP projects, and a discussion of implementing a Stormwater Utility. The recommended capital improvement projects include structural elements to address flooding and water quality related issues previously discussed which are primarily based upon current storm drainage problems identified by City staff.

Whenever an inadequately sized culvert, pipe, or channel is replaced or repaired, the improvement may transfer the problem downstream by allowing more flow through a previously restricted point. Flooding risk can be decreased by greater understanding of where flows will be directed during major storms if upstream improvements are made. Building a sufficiently detailed hydrologic and hydraulic model is recommended prior to designing each CIP.

Large stormwater capital improvement projects not now identified as part of this Plan may be needed in the future. Smaller unforeseen CIP projects can be addressed by a "spot drainage" program, but larger projects will quickly exceed the program's limited budget. Unanticipated projects may be necessary for emergencies, to address growth, to meet other city goals or to address water quality problems. Due to budgetary constraints, the construction of these unanticipated projects may drive changes in the proposed completion date for current CIP projects. As new information becomes available, the plan can be adapted to reschedule, add, or delete proposed projects, and to expand or reduce the scope of the projects. As the proposed project date approaches, each capital improvement project will be re-evaluated by staff and approved by the City Council. In this way, the plan remains responsive to both long-term and short-term needs.

CAPITAL IMPROVEMENT PLAN

The following recommended Capital Improvement Plan includes seven capital improvement projects as prioritized by City staff. The recommended CIP projects scheduled for completion within the next 2 to 10 years are described below. These projects are shown in Figure 6-1 and are summarized in Table 6-1. Specific detailed project related cost estimates are found in Appendix B. Each project cost estimate includes an additional 30 percent construction contingency and 30 percent for engineering design services/ administration/permitting, and a 7.8 percent sales tax. All project costs are based on 2024 dollars with a 3.0 percent annual adjustment made for inflation in future years. The naming convention for the projects described below uses

the initials of the type of project (i.e., "F" for Field identified projects and "M" for model identified projects), along with an identification number.

Some of the projects listed may require easement coordination with property owners. Easement acquisition will be incorporated as part of the project's overall schedule.

F1A: 10TH STREET CONVEYANCE PIPE REPLACEMENT

Priority: High

Description: Replace 210 LF 18-inch stormwater pipe. This plan assumes the entire run of pipe will be replaced but City Staff may want to camera the pipe to see if the whole pipe is damaged or if the damage is centered toward the west end. A spot repair of the damaged pipe may reduce costs. See Figure 6-2.

Estimated Project Cost 2024 Dollars: $167,000
Estimated Cost in Year of Construction (2026): $178,000

F1B: 10TH STREET DOWNSTREAM UPSIZING

Priority: Medium

Description: Replace approximately 775 LF of undersized 18-inch stormwater pipe along 10th St. from Foster Avenue to Fairview Avenue with 24-inch stormwater pipe. Provide a water quality retrofit by renovating the existing ditch to a bioswale. See Figure 6-3.

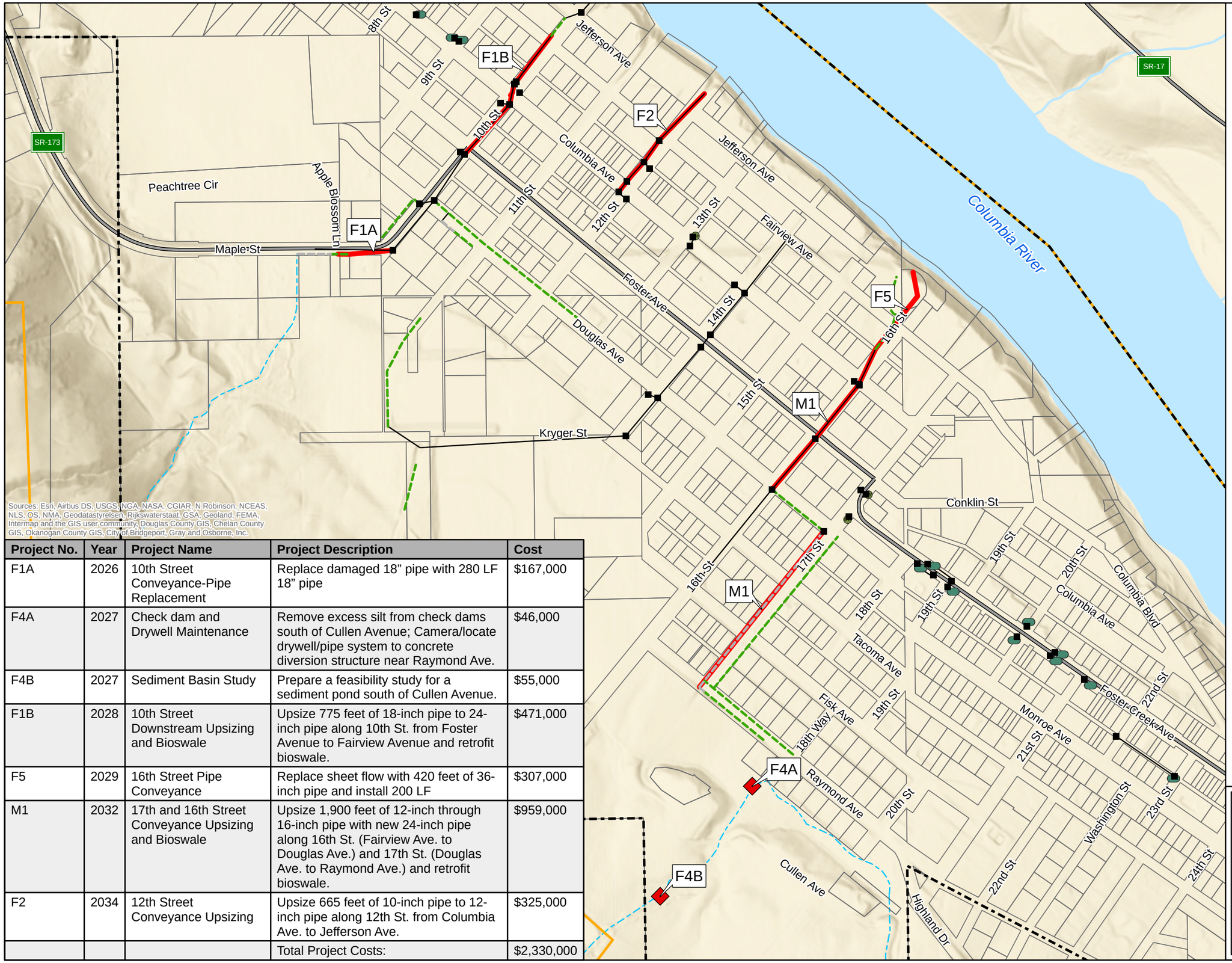
Estimated Project Cost 2024 Dollars: $471,000
Estimated Cost in Year of Construction (2028): $531,000

F2: 12TH STREET CONVEYANCE UPSIZING

Priority: Low

Description: Replace approximately 665 LF of undersized 10-inch pipe with 12-inch stormwater pipe along 12th Street from Columbia Avenue to Jefferson Avenue. The end of the project area can be reviewed for a potential proprietary water quality facility. The cost estimate provided here does not include the cost of a water quality facility. See Figure 6-4.

Estimated Project Cost 2024 Dollars: $325,000
Estimated Cost in Year of Construction (2034): $437,000



Project No.	Year	Project Name	Project Description	Cost
F1A	2026	10th Street Conveyance-Pipe Replacement	Replace damaged 18” pipe with 280 LF 18” pipe	$167,000
F4A	2027	Check dam and Drywell Maintenance	Remove excess silt from check dams south of Cullen Avenue; Camera/locate drywell/pipe system to concrete diversion structure near Raymond Ave.	$46,000
F4B	2027	Sediment Basin Study	Prepare a feasibility study for a sediment pond south of Cullen Avenue.	$55,000
F1B	2028	10th Street Downstream Upsizing and Bioswale	Upsize 775 feet of 18-inch pipe to 24-inch pipe along 10th St. from Foster Avenue to Fairview Avenue and retrofit bioswale.	$471,000
F5	2029	16th Street Pipe Conveyance	Replace sheet flow with 420 feet of 36-inch pipe and install 200 LF	$307,000
M1	2032	17th and 16th Street Conveyance Upsizing and Bioswale	Upsize 1,900 feet of 12-inch through 16-inch pipe with new 24-inch pipe along 16th St. (Fairview Ave. to Douglas Ave.) and 17th St. (Douglas Ave. to Raymond Ave.) and retrofit bioswale.	$959,000
F2	2034	12th Street Conveyance Upsizing	Upsize 665 feet of 10-inch pipe to 12-inch pipe along 12th St. from Columbia Ave. to Jefferson Ave.	$325,000
			Total Project Costs:	$2,330,000

CIP Project
- CIP Facility
- CIP Storm Pipe

Existing Storm Assets
- Catch Basin
- Drywell
- Infiltration Chambers
- Stormwater Pipe
- Ditch
- Culvert

Reference
- Stream
- Intermittent Stream
- Highway
- City Limits
- Urban Growth Area
- Parcel
- Surface Water

N

0 200 400 800 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 6-1

CAPITAL IMPROVEMENT PROJECT LOCATIONS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Proposed Storm Features

- Catch Basin
- Storm Pipe

Existing Storm Features

- Type 1 Catch Basin
- Existing Stormwater Pipe
- Ditch
- Culvert
- Parcel

N

0 12.5 25 50 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 6-2

F1A CIP: 10TH STREET CONVEYANCE PIPE

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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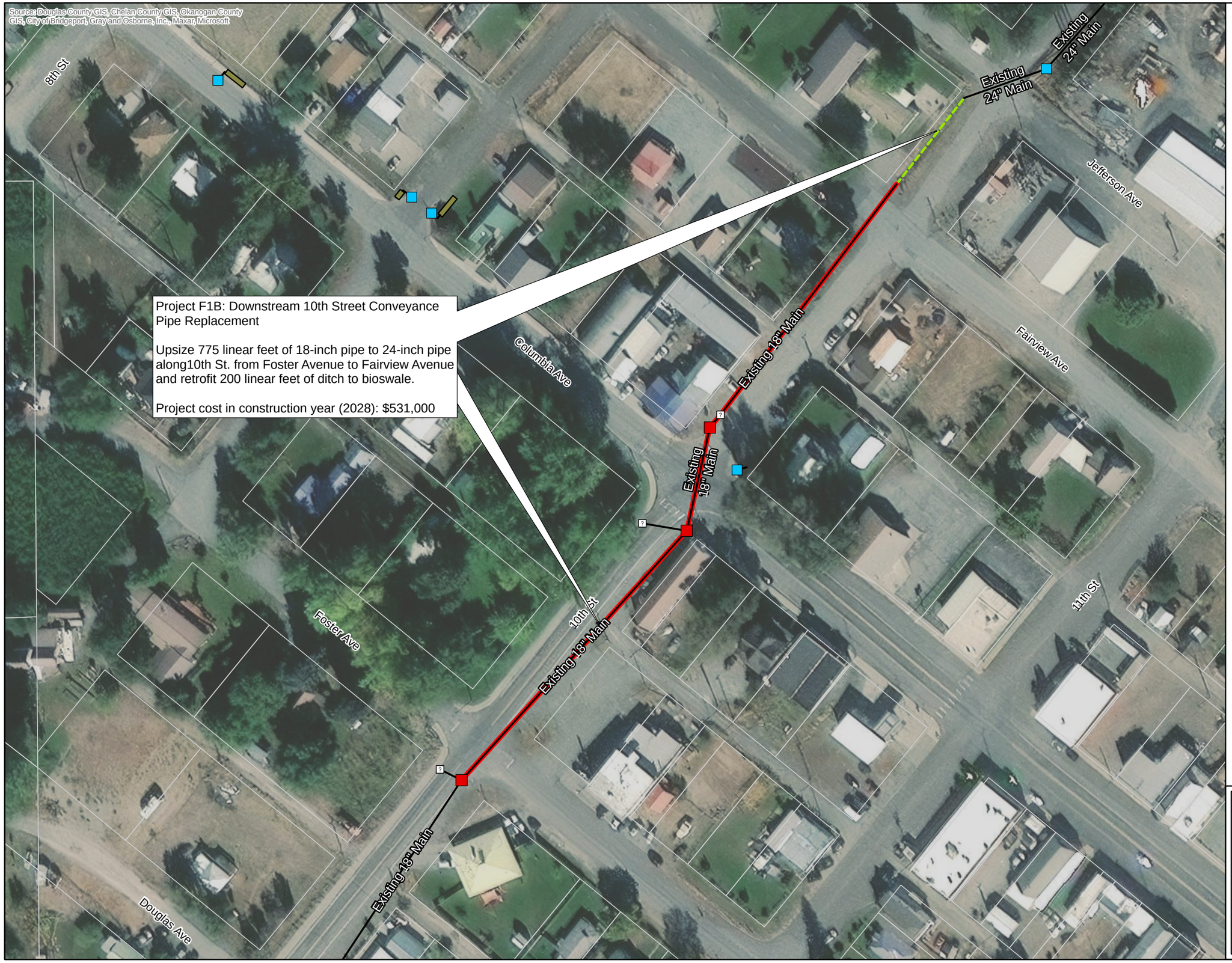

Proposed Storm Features

- Catch Basin
- Storm Pipe

Existing Storm Features

- Type 1 Catch Basin
- Unknown Type Catch Basin
- Existing Stormwater Pipe
- Ditch
- Parcel

N

0 25 50 100 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 6-3

F1B CIP: 10TH STREET DOWNSTREAM UPSIZING AND BIOSWALE RETROFIT

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\BRIDGEPORT\23851 Stormwater Plan\GIS\APRX\PlanFigures\PlanFigures.aprx

Proposed Storm Features

- Catch Basin
- Storm Pipe

Existing Storm Features

- Type 1 Catch Basin
- Unknown Type Catch Basin
- Existing Stormwater Pipe
- Parcel

N

0 25 50 100 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 6-4

F2 CIP: 12TH STREET CONVEYANCE UPSIZING

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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F4A: CHECK DAM AND DRY WELL MAINTENANCE

Priority: High

Description: Remove excess silt from check dams south of Cullen Avenue. Camera and/or locate drywell near Raymond Avenue to concrete diversion structure. Once found, clean system which is presumed to be silted in. See Figure 6-5.

Estimated Project Cost 2024 Dollars: $46,000
Estimated Cost in Year of Construction (2027): $51,000

F4B: SEDIMENT BASIN STUDY

Priority: Low

Description: Prepare a study to evaluate the feasibility of a sediment pond or basin to intercept sediment in stormwater runoff near the city limits. See Figure 6-5 for a potential sediment basin location.

Estimated Project Cost 2024 Dollars: $55,000
Estimated Project Cost in Year of Completion (2027): $61,000

F5: 16TH STREET PIPE CONVEYANCE

Priority: Medium

Description: Fix sheet flow over private property by installing approximately 420 LF of 36-inch storm pipe from the existing 16th Street system toward the City owned property north of Fairview Avenue (see Figure 6-6). This project will require easements from the property owner who surrounds the City owned property on both the north and south sides.

Estimated Project Cost 2024 Dollars: $307,000
Estimated Cost in Year of Construction (2029): $356,000

M1: 17TH AND 16TH STREET CONVEYANCE UPSIZING AND BIOSWALE

Priority: Medium

Description: As identified in the stormwater model, replace approximately 1,900 LF of 12-inch to 16-inch stormwater pipe with 24-inch pipe. Pipe relocations include the areas along 17th Street from Raymond Avenue to Douglas Avenue and along 16th Street from Douglas Avenue towards Fairview Avenue. This project also entails retrofitting the ditch in Douglas Avenue into a 200 LF bioswale to provide water quality treatment prior to discharging to the Columbia River. See Figure 6-7.

Estimated Project Cost 2024 Dollars: $959,000
Estimated Cost in Year of Construction (2032): $1,215,000

Table 6-1 provides a summary of the proposed CIPs.

Source: Douglas County GIS, Chelan County GIS, Okanogan County GIS, City of Bridgeport, Gray and Osborne, Inc., Maxar, Microsoft

Lincoln Ave

16th St

17th St

Raymond Ave

Fisk Ave

18th Way

19th St

Cullen Ave

Project F4A: Check Dam and Drywell Maintenance

Clear sediment from check dams, locate and maintain existing drywell, downstream system to Raymond Ave.

Project cost in construction year (2027): $51,000

Project F4B: Sediment Basin Study

Perform feasibility study for a sediment pond.

Project cost in construction year (2027): $61,000

- Check Dam
- Culvert
- Ditch
- Intermittent Stream
- City Limits
- Urban Growth Area
- Parcel

N

0 50 100 200 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 6-5

F4A & F4B CIP: CHECK DAM AND DRYWELL MAINTENANCE

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Source: Douglas County GIS, Chelan County GIS, Okanogan County GIS, City of Bridgeport, Gray and Osborne, Inc., Maxar

Project M1: 16th & 17th Street Upsizing

1900 linear feet of 12-inch diameter pipe to be upsized to 16-inch on 16th St. and17th St.

Project cost in construction year (2032): $1,215,000

Retrofit approximately 200 linear feet of this ditch to a bioswale.

14th St
Existing 24" Main
15th St
Foster Ave
Existing 12" Main
Existing 16" Main
Columbia Ave
Fairview Ave
16th St
Douglas Ave
Conklin St
Foster Creek Ave
17th St
Existing 12" Main
Existing 12" Main
Tacoma Ave
18th St
Monroe Ave
19th St
Fisk Ave
Raymond Ave
18th Way
19th St

Potential Storm Features
- Catch Basin
- Storm Pipe

Existing Storm Features
- Type 1 Catch Basin
- Unknown Type Catch Basin
- Drywell
- Existing Stormwater Pipe
- Culvert
- Ditch
- Infiltration Chambers
- Parcel

N

0 50 100 200 Feet

CITY OF BRIDGEPORT

STORMWATER MANAGEMENT PLAN

FIGURE 6-7

M1 CIP: 16TH & 17TH STREET CONVEYANCE PIPE UPSIZING

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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TABLE 6-1

Capital Improvement Plan Projects

Project No.	Year	Project Name	Project Description	Cost[(1)]
F1A	2026	10th Street Conveyance-Pipe Replacement	Replace damaged 18-inch pipe with 280 LF 18-inch pipe	$167,000
F4A	2027	Check dam and Dry Well Maintenance	Remove excess silt from check dams south of Cullen Avenue; Camera/locate drywell/pipe system to concrete diversion structure near Raymond Avenue.	$46,000
F4B	2027	Sediment Basin Study	Prepare a feasibility study for a sediment pond south of Cullen Avenue.	$55,000
F1B	2028	10th Street Downstream Upsizing and Bioswale	Upsize 775 feet of 18-inch pipe to 24-inch pipe along 10th Street from Foster Avenue to Fairview Avenue and retrofit bioswale.	$471,000
F5	2029	16th Street Pipe Conveyance	Replace sheet flow with 420 feet of 36-inch pipe and install 200 LF	$307,000
M1	2032	17th and 16th Street Conveyance Upsizing and Bioswale	Upsize 1,900 feet of 12-inch through 16-inch pipe with new 24-inch pipe along 16th Street (Fairview Avenue to Douglas Avenue) and 17th Street (Douglas Avenue to Raymond Avenue) and retrofit bioswale.	$959,000
F2	2034	12th Street Conveyance Upsizing	Upsize 665 feet of 10-inch pipe to 12-inch pipe along 12th Street from Columbia Avenue to Jefferson Avenue.	$325,000
Total Project Costs				**$2,330,000**

(1) Costs shown represent 2024 dollars.
(2) Schedule per recommended rate, see Preliminary Rate Analysis Scenario C.

FINANCIAL PLAN

METHODS OF FUNDING

The capital resources, other than service charges and Service Connection Charges, available to a city to construct stormwater improvements include grant and loan funds, debt financing, and improvement districts. Most of these resources support capital improvements such as storm sewer construction. The various methods of capital improvement funding are described below.

Grant and Loan Funds

There are several grant and loan funds available for capital improvements. Among these are the Public Works Trust Fund (PWTF) and the Washington State Department of Ecology Water Quality Combined Funding Program, which includes several different funding programs. In addition, the Department of Ecology Flood Control Assistance Account Program (FCAAP) can be utilized to construct flood control projects. The Aquatic Lands Enhancement Account (ALEA) provides grants for preservation or improvement of wetlands, natural systems, waterfront redevelopment, plus some aquatic land-related planning. Other potential funding sources include the Community Development Block Grant (CDBG), the Rural Community Assistance Corporation (RCAC), and the USDA Rural Development, Water and Waste Disposal Loan and Grant Program. Grant funding is limited; therefore, loans are the more likely source for outside funding.

Public Works Trust Fund

The PWTF is a revolving loan fund designed to help local governments finance needed public works projects through low-interest loans, limited grant funding and technical assistance. The PWTF, established in 1985 by legislative action, offers loans substantially below market rates, payable over periods ranging up to 20 years. The Public Works Trust Fund program also provides low-interest loans to fund preconstruction activities that can be used prior to construction activities. Preconstruction loan terms are generally 5-years. Preconstruction loans may be converted to a 20-year term prior to the first loan payment only, provided 30 percent of the funding required for construction has been secured. Funding is subject to state legislature appropriation and is not guaranteed to be available every year.

PWTF has four loan programs: Construction, Preconstruction, Planning, and Emergency. The Construction Program accepts applications once per year in the spring, and the money becomes available approximately one year later. The Preconstruction and Planning Programs are open every other month and must be submitted to the Public Works Board prior to the 15th of the month to be reviewed at the next Board meeting. Eligible jurisdictions can apply for Pre-Construction and Emergency Loans year-round. These funds become available shortly after the Public Works Board makes its final

decision as to the award. Emergency projects must have a locally declared emergency and are applied for on an open cycle depending on the availability of funds. Project expenditures are reimbursable from the date of the declared emergency.

An applicant must have a long-term plan for financing their public works needs. If the applicant is a county or city, it must adopt the 1/4 percent real estate excise tax that is dedicated to public works construction projects. Eligible public works projects include streets and roads, bridges, storm sewers, sanitary sewer collection and treatment systems, and domestic water. Loans are presently offered only for purposes of repair, replacement, rehabilitation, reconstruction, or improvement of existing eligible public works systems. Eligible project costs can include expenses related to serving 20-year forecasted growth as identified in a growth management comprehensive plan.

Since substantially more trust fund dollars are requested than are available, local jurisdictions must compete for the available funds. The applications are carefully evaluated, and the Public Works Board submits a prioritized list of those projects that are recommended to receive low-interest financing to the legislature.

Department of Ecology Water Quality Combined Funding Program

The Department of Ecology administers several loan and grant programs that can be used to fund the following:

- Stormwater Capital Improvements including Stormwater System Retrofits
- Low-Impact Development Projects
- Inventories of Stormwater Sources
- Public Education and Communication
- Review and Preparation of Stormwater Regulations
- Mapping
- Source Control Activities
- Establishing and Refining Stormwater Utilities

A common application is available for funding from the Ecology-administered programs. The programs are competitive and the majority of the funding available is in the form of State Revolving Fund (SRF) low-interest loans. Interest rates are established annually: Currently, 5-year loans are 0.6 percent for most projects and 0.2 percent for On-site Septic/Nonpint Source Activity Projects; 20-year loan rates are 1.2 percent and 0.4 percent; and 30-year loan rates are 1.6 percent and 0.8 percent. Some Hardship loan funding is also available.

Stormwater Financial Assistance Program

The Stormwater Financial Assistance Program (SFAP) is administered by Ecology to provide funding for design and/or construction of stormwater facility retrofits. Construction of facilities for new development or redevelopment is not eligible, though grant funds may pay for the portion of a facility that treats runoff from existing surfaces. Stormwater source control activity projects are also eligible if they provide water quality benefits for 3 years beyond the grant period. The maximum total grant award is $5.0 million per funding cycle per City. Required matching for nonpoint source activity projects is 25 percent or 15 percent for hardship-eligible communities (population below 25,000 and median household income below 80 percent of state median household income). SFAP grant-eligible activities are limited to stormwater pollutant control projects that enhance existing stormwater programs and provide water quality benefits extending beyond the grant period (typically 3 years). See Guidelines for updates to match requirements.

Centennial Clean Water Fund

The Centennial Clean Water Fund (CCWF) is state funded and provides loans and grants for projects that enhance water quality. Eligible stormwater projects include water quality treatment facilities and projects or facilities that address nonpoint pollution problems. Projects that only address flood control or wetlands purchases are not eligible under the CCWF. Under the CCWF grant program, water quality facilities construction projects may receive 50 to 100 percent of the eligible cost as lower interest rates (1.3 to 0 percent); however, grant funding is only available to those who can document hardship. Hardship is demonstrated if the residential population in the service area is less than 25,000 and the median household income of the service area is less than 80 percent of the state median household income. The Centennial Program provides grants for wastewater infrastructure and nonpoint source pollution control projects. Infrastructure (facility) projects are limited to wastewater facility preconstruction hardship and wastewater construction projects in hardship-eligible communities. Maximum grant potential is $5,000,000 per project. Though rarely done, Ecology may also make loans using funds from Centennial.

The design and construction of water quality facilities are also eligible for 100 percent loans through CCWF. Recent loan terms have been 1.0 percent interest rate for repayment schedules from 1 to 5 years and 2.0 percent for repayment schedules between 5 and 20 years. The CCWF is a competitive program. Applications are scored according to a rating system that includes such factors as seriousness of the water quality problem, public health impacts, and beneficial impact of the project on water quality. Generally, hardship communities may receive 50 percent Centennial Grant funding for Preconstruction activities, along with a standard Clean Water SRF Standard Loan for the other 50 percent. Centennial funding for Construction Projects is limited to $5 million/project.

Section 319 Funding

The Section 319 Funding Program is administered by the EPA and by the Department of Ecology. Funding is available for watershed planning, implementation of stormwater best management practices (BMPs), water quality monitoring, and outreach efforts. Grant recipients that implement BMPs are required to report water quality monitoring data to Ecology annually. Projects may be awarded up to $500,000, and matching requirements differ by project type and the amount awarded. Required matching for nonpoint source activity projects is 25 percent or 15 percent for hardship-eligible communities (population below 25,000 and median household income below 80 percent of state median household income).

Water Pollution Control State Revolving Fund

The State Revolving Fund (SRF) Program is state-funded and provides loans for stormwater pollution control-related projects. The federal government provides annual funding through EPA to support the SRF Program, which requires State Environmental Review Process (SERP) documentation, similar to National Environmental Policy Act (NEPA) review. Projects that are eligible for funding under this program must have a component that contributes to the improvement of water quality; flood control projects are not eligible. Loan terms vary annually depending on the payback period. Recent loan terms are 1.2 percent interest on loans with 20-year payback periods, and 0.6 percent interest on loans paid back in 5 years. Loans can cover 100 percent of the project cost.

Aquatic Lands Enhancement Account

The ALEA was established in 1994 to provide grants to cities, towns, counties, and port districts for preservation or improvement of wetlands, natural systems, waterfront redevelopment, plus some aquatic land-related planning. The program is administered by the State Recreation and Conservation Office and is funded primarily by revenue generated by the State Department of Natural Resources' management of state-owned aquatic lands. The maximum grants are $1,000,000 for acquisitions projects and $500,000 for restoration, improvement, or development projects. The project must be associated with state-owned aquatic lands. Applicants must provide a minimum 50 percent match for each project. A storm project that redirects or treats runoff and thus improves state-owned aquatic lands would be an eligible project under this program. See ALEA link above for additional information.

Rural Community Assistance Corporation

The RCAC provides financing for water, wastewater, and stormwater planning and environmental work to rural communities with populations below 50,000 people throughout the western U.S. Stormwater projects that incorporate low-impact development techniques may qualify for priority in the loan application process. The RCAC issues loans for feasibility and predevelopment of infrastructure projects.

Typically, up to $50,000 is available for feasibility loans and up to $350,000 is available for predevelopment loans with a 5 percent interest rate. These loans can be used as interim funding for USDA Rural Development funding. See RCAC link for additional information.

Community Development Block Grant

The CDBG provides general-purpose grant financing for public infrastructure work to rural communities with populations below 50,000 people that are not participating in a CDBG entitlement urban county consortium. Acquisition, planning, design, and construction or renovation projects including stormwater infrastructure are eligible if the project will benefit primarily low- and moderate-income persons. The grant stipulates that 51 percent of the project must benefit low- to moderate-income persons. The Washington State Community Development Block Grant is provided by the Federal Department of Housing and Urban Development (HUD). The Washington General Purpose Grant Program is generally limited to approximately $11 million per year. The current maximum grant amount is $ 2 million. Commerce currently has $2 million available and anticipates an additional $11 million in the fall of 2024. Commerce has adopted a 2-part application process to establish project and applicant eligibility prior to formal application submittals. See Commerce/CDBG link above for additional information.

USDA Rural Development, Water and Waste Disposal Loan and Grant Program

The USDA provides funding and assistance for stormwater drainage improvements in rural areas and towns with populations below 10,000 people. The program provides long-term, low-interest rate loans. Interest rates are set quarterly. The program may also provide grants to loan recipients if funding is available and if a need is demonstrated. Predevelopment planning grants require a match of 25 percent, though construction grants do not require a match. Rural development does not give 100 percent grants which must be combined with rural development loan funding. Larger rural development-funded projects often require interim financing. RCAC and evergreen rural water association loans can be used for interim financing. See link provided for additional information.

Debt Financing

Two forms of debt financing are available for capital improvements including general obligation (G.O.) bonds and revenue bonds. General obligation bonds are backed by the "full faith and credit of the city" and are paid for through property tax levies. These bonds require voter approval before they can be implemented. A less common means of financing capital improvements associated with stormwater projects is through the use of revenue bonds. The City, like other municipalities, is capable of issuing tax-exempt bonds. The principal and interest of such bonds are repaid from revenue generated from a water, sewer, or stormwater utility. This type of funding may be offered without voter

approval. However, in order to qualify to sell revenue bonds, the City must establish that its net operating income (gross income less expenses) is equal to or greater than its debt coverage factor (typically 1.3 to 1.4 times the annual principal and interest due for all outstanding bonded indebtedness). Essentially, utility rates have to be set high enough to ensure revenue bond repayment.

Developer Fees

The City may require improvements for service to a property within new plats or commercial improvements to be financed by the developer. The developer, for example, is usually required to construct detention facilities in accordance with city standards or pay into a fund for construction of an off-site facility to serve multiple properties. The alternative approach allows the City to develop facilities in a planned and cost-effective manner. However, several developments are generally required before the City has available funds to construct a regional facility. The City has little control over the scheduling of such facilities unless alternative funding sources, such as service charge revenues, are utilized on a short-term basis to fund initial construction and are then repaid as developer fees are collected.

Improvement Districts and Special Assessments

Levying of special assessments on benefited properties has been used throughout the state for stormwater improvements. Projects funded through special assessments must have an identifiable benefit to the properties included in the assessment area, and charges for each parcel must be consistent with the relative benefit to each property. In Washington, municipalities can establish a local improvement district (LID) or utility local improvement district (ULID). These approaches require an assessment against benefited property owners within the district boundaries. Any LID may be initiated upon a petition signed by the owners of property aggregating a majority (50 percent) of the area within the proposed district. An LID initiated by resolution would be divested by a protest signed by the owners of a property within the district and filed with the city council within 10 days from the date of passage of the ordinance ordering the improvement if the property within the district is subject to 60 percent or more of the total cost of the improvement.

The use of LIDs to fund stormwater projects is complicated by the difficulty in quantifying benefits for individual property owners. For water and sewer improvements, for example, the benefits are generally easy to identify. With drainage improvements, however, upstream or hillside properties, which could contribute significantly to runoff, may actually benefit little from improvements because of their protected location. Another problem with LIDs is that they place heavy administrative burdens on City staff to maintain the improvements in the district.

Stormwater Management Utility

Another way to pay for stormwater related infrastructure is through a City's Stormwater Management Utility. Historically, general revenues from property taxes have financed stormwater management programs. Revenue from these types of taxes tends to be inadequate to fund necessary stormwater management services. Often, funds for stormwater management projects are diverted to other areas that garner more public support, such as law enforcement or public parks.

RCW Chapter 35.67 allows the City to form a stormwater management utility to provide for the planning, development, management, operation, maintenance, use, and improvements of the storm drainage system. A utility is an enterprise that is operated or regulated by a government entity. The enterprise funds are predominantly self-sustaining and account for the acquisition, operation, and maintenance of governmental facilities.

A stormwater management utility can be formed by adoption of an ordinance by the City Council. An example ordinance is provided in Appendix C. This ordinance would create a stormwater management utility and the associated enterprise fund. Appendix C contains an example stormwater management utility rate ordinance defining the service charges that could be adopted by the City Council.

Most stormwater management utilities have followed a developmental path similar to that of government-operated water and wastewater utilities. Legal, procedural, and conceptual guidelines for proper rate setting for water and wastewater utilities have set a precedent for stormwater management utilities to follow.

The following guidelines are important to follow when considering any utility rate structure:

- A utility rate should be legal and enforceable.
- A utility rate should be perceived as equitable by the public in order to gain widespread acceptance.
- A billing system should require a relatively small portion of the total utility revenues and the cost of implementing the billing system should be reasonable.
- A rate structure should reflect the long-term needs and goals of the utility.

The service charge is a fee levied by the City upon all developed property within the City's boundary. These charges may provide revenue for the stormwater operation and maintenance expenditures, depreciation of existing facilities, and construction of stormwater infrastructure. The connection charge, or System Development Charge (SDC), is typically based on the value of the existing system and includes the future

customer's share of the existing storm drainage system. Connection charges can only be used to fund major capital improvements. For the purposes of this analysis, it is assumed that the City would not institute a System Development Charge at this time.

Service Charge

Various methods or combinations of methods have been used to determine stormwater management utility service charges. Most stormwater management utility fees are based on the impervious cover on a parcel of land. This is because the amount of impervious cover is directly proportional to the volume of stormwater runoff produced by a given area.

The approach taken by many utilities bases the rate structure on the average amount of impervious cover on a single-family residential parcel or equivalent residential unit (ERU). All single-family residences are charged the same rate and charges to other types of customers are in relation to the ERU. For this Plan it is recommended the City use 5,000 sf per ERU as a basis for calculating monthly stormwater service charges. This Plan assumes all units, both residential and commercial, are counted as one ERU.

Some utilities use total property area, a more basic parameter, as the ERU basis for determining rates because this information is often more readily available than total impervious cover.

Other utilities use directly connected impervious area (DCIA), such as roof drains that connect to a gutter instead of splash blocks on a lawn, as the rate structure basis. This methodology of determining an ERU would be more complex and costly to determine.

Many utilities offer credits, mostly to nonresidential customers, for stormwater management activities that meet or exceed the minimum development standards. The credits help to increase public support of the stormwater management utility and provide incentive to properly maintain on-site stormwater management facilities.

Service Charge Determination

The monthly service charge per ERU was determined by dividing the operation and maintenance costs and capital improvement expenses by the existing number of ERUs. The City's current zoning includes 662 single-family residences, 41 apartment units and 51 retail/trade businesses. For the purposes of this analysis, a total of 754 ERUs (= 662 SFR+ 41 MFR + 39 retail/trade) were assumed. The analysis also presumes the City's goal is to maintain a cash balance equal to 6 months of operating expenses in the utility fund.

Capital improvement projects from Table 6-1 would be funded from monthly service rates and/or a low-interest loan from the Department of Ecology Water Quality Combined Funding Program where necessary. Use of these low-interest loans may be

financially favorable to self-financing as long as the interest costs of the loans are less than the interest that can be earned from reserve funds. An annual inflation rate of 3 percent is assumed for both rates and project costs. A growth rate of 0.5 percent is assumed.

PRELIMINARY RATE ANALYSIS

Four scenarios of financing capital improvement projects (CIPs) were analyzed to determine the required monthly stormwater utility rate. The analysis assumed that all CIPs would be built and that an additional $10,000 would be reserved for miscellaneous capital types of projects throughout any given year.

The budget forecast assumptions for this Plan are included in Table 6-2. Additionally, per the maintenance table in Chapter 5, the stormwater utility expenses were assumed to be $70,000 annually for O&M.

TABLE 6-2

Financial Forecast Assumptions

Item	Assumption
Number of ERUs in 2024	754
Growth (Single-Family and Non-Single-Family)	1.0%
General Costs Inflation	3.0%
Construction Costs Inflation	3.0%
Loan Interest	2.0%
Annual Stormwater Rate Increase	2.0%

The funding scenarios varied based on source of financing and length of time for completion of the capital improvement plan. The detailed schedules for each scenario are included in Appendix D.

- **Scenario A –** All CIPs are paid in full by utility and all projects are complete by 2035. 2025 Monthly Service Charge – **$42/ERU**
- **Scenario B –** All CIPs are paid in full by utility and all projects are complete by 2045. 2025 Monthly Service Charge – **$27/ERU**
- **Scenario C –** All CIPs are funded through the Department of Ecology Water Quality Combined Funding Program loan for 20-year terms and all projects are complete by 2034. 2025 Monthly Service Charge – **$20/ERU**
- **Scenario D –** Only operation and maintenance is paid by the utility and no CIPs are constructed (or they are entirely grant funded with no match needed by the City). 2025 Monthly Service Charge – **$10/ERU**

Low-interest loan financing of these projects is not guaranteed. Revenue bond financing will have higher debt service and debt coverage requirements and a resulting higher rate impact. In this analysis, a portion of the City's revenue is obtained from growth-related revenue sources and increased service rate revenue. If the expected growth does not occur or if low-interest loan financing is not obtained, the City must find alternate sources of revenue or delay the completion of the capital improvement program.

RATE COMPARISON

As described above, funding Scenarios B through D appear to be the most feasible for the City. The resulting rates range from $10/ERU to $26/ERU. As a comparison, Table 6-3 provides stormwater rates for other jurisdictions within Washington State that are somewhat similar in population.

TABLE 6-3

Rate Comparison Table

City or Town	Rate/ERU
City of Bridgeport (Recommended)	**$10-$26**
City of Long Beach	$14.65
City of Leavenworth	$5.59
Town of Friday Harbor	$13.75
City of Colville	$4.00

RECOMMENDATION

The City could implement a stormwater utility to fund the CIP plan presented herein. Sample ordinances for the formation of a stormwater utility and the implementation of a monthly service charge are included in Appendix C.

In order to construct the proposed CIPs within 10 years, the City could collect a service charge of $20 per ERU per month assuming loans could be secured for all projects. The service charge will provide revenue for administration, operation and maintenance, and repair through capital improvement projects. Additionally, grant funding may be available that would reduce the City's direct costs to implement the projects. As seen in Scenario D, a minimum of $10 per ERU per month service charge is necessary to pay for operations and maintenance alone. This equates to $120 per ERU on an annual basis. It is assumed that the monthly service charge will be increased by 2 percent each year to keep up with inflation.

The City should review the service charge annually to compare actual expenses and growth rate with the assumptions outlined in this Plan.

Table 6-1 included a schedule for implementation of the CIPs assuming an initial monthly service charge of $20 per ERU for the loan-funded scenario where all projects are completed in 10 years. The priority of these projects should be adjusted should transportation projects allow for the opportunity to construct a CIP earlier than previously planned. If this scenario is economically infeasible for the property owners of Bridgeport, the City could charge a $10 per ERU rate for funding only operations and maintenance. The City could then re-evaluate the service charge at a later date and/or fund CIPs solely through grants as opportunities become available. Appendix D includes the detailed financial analysis sheets for each scenario.

APPENDIX A

OPERATIONS AND MAINTENANCE MANUAL

WATER QUALITY
BEST MANAGEMENT PRACTICES FOR OPERATION AND MAINTENANCE OF PUBLICLY-OWNED PROPERTY

May 2024

TABLE OF CONTENTS

OPERATIONS AND ACTIVITIES THAT REQUIRE WATER QUALITY BMPS

INTRODUCTION

Water quality protection is now a consideration for all activities performed by the City. This appendix is intended to meet specific needs of the City of Bridgeport. The goal is to provide standard management practices for each activity that maintenance crews perform. This appendix includes guidance on operation and maintenance of stormwater management BMPs that are not currently in use within the City, however, the guidance is included in case the City does install new BMPs in the future.

Scope

Water quality protection practices are addressed here. These include two main categories:

- Practices to assure that water quality BMPs such as swales and treatment ponds are maintained to make sure they are performing as intended; and
- Practices to eliminate or reduce the pollution caused by operation and maintenance activities such as ditch cleaning or road repairs.

Habitat preservation practices are largely avoiding or minimizing vegetation removal and the use of chemical controls, and promoting native vegetation where feasible.

Practices in this appendix are subject to updates as more detailed storm sewer and road maintenance standards are developed.

Layout

This appendix lists activities to operate and maintain stormwater facilities, maintain roads, and perform park and landscape maintenance.

For each activity, this appendix:

- Briefly describes the activity that needs BMPs.
- Lists the water quality and non-water quality outcomes from the activity. In many cases there is added description of the desired outcome for the activity.
- Lists the BMPs to meet the water quality protection requirements.

Activities

Activities are the actions that road and storm sewer maintenance crews take in the routine performance of their jobs. Some activities such as catch basin cleaning are water quality best management practices. Others, such as ditch maintenance require best management practices. The activities are listed in the table of contents.

Activities covered may include small capital projects and overlays, but any project with work in a habitat buffer or stream channel is a larger project that requires permitting and specific BMPs beyond those included here.

Outcomes

Each activity meets desired outcomes, which are listed for each activity. There are two sets of outcomes for each activity:

- Water Quality Outcomes
- Infrastructure Maintenance Outcomes

This appendix provides practices to reach the water quality outcomes and infrastructure maintenance requirements specific to water quality or habitat protection.

The Water Quality Outcomes are:

O1	Minimize sediment and pollutant discharges from the work area
O2	Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
O3	Minimize vegetation removal
O4	Preserve native plants

The Infrastructure Maintenance Outcomes are:

O5	Protect public safety and health
O6	Prevent catastrophic infrastructure failures
O7	Maintain or restore the intended infrastructure function
O8	Prevent or reduce flooding
O9	Protect infrastructure
O10	Meet public expectations for aesthetics

Practices

Practices are the best management practices necessary to meet the water quality outcomes for each activity. Practices were compiled from other agencies' manuals, the NPDES stormwater management program, or from regulatory requirements.

The practices listed for each activity may be more thoroughly described in separate chapters about BMPs or in other agencies' manuals. The Washington State Department of Ecology Stormwater Management Manual for Eastern Washington (Manual, 2024) is a good reference for specific BMPs. Maintenance guidance is included in Appendix A of Chapter 5 and Appendix A of Chapter 6 in the Manual.

STORMWATER FACILITY OPERATION AND MAINTENANCE

Stormwater facility maintenance includes activities that care for storm drains. They include all of the pipes, catch basins, drywells, manholes, swales, retention/detention ponds, oil/water separators, etc. in urbanized areas and some subdivisions in rural areas. Storm sewer maintenance does not include roadside ditch maintenance, which is described as a road maintenance activity.

SPECIAL FACILITIES MAINTENANCE REQUIREMENTS

This appendix provides a set of minimum standards and practices for maintaining stormwater facilities. Manufactured stormwater facilities such as leaf compost filters and oil/water separators often have maintenance requirements and manuals specified or written by the manufacturer. Also, larger or more complex stormwater facilities may include specifications for maintenance and vegetation management that provide specific detail above this appendix.

Manufacturer or Designer's Maintenance Manuals

Where the Public Works Supervisor determines that manuals or plans provide equal or greater level of maintenance and water quality protection, they shall be followed by the owner. These individual maintenance plans, specifications, or manuals must be approved by the Public Works Supervisor. Review of the manuals and plans should include an engineer, senior maintenance staff and, if available, the manual preparer.

One of a Kind Facilities

The director may require development and implementation of a site-specific maintenance plan for complex or unusual facilities. The plan is required when the general provisions of this manual do not provide sufficient detail for inspection, maintenance, vegetation management, and repair practices to operate the facility.

CATCH BASINS AND INLETS

Catch Basins trap sediment and some oils that can pollute water bodies. They need to be inspected and cleaned annually to remove accumulated sediment, fluids, and trash.

Outcomes

- O1 Avoid or minimize sediment and pollutant discharges from the work area
- O2 Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
- O7 Maintain or restore the intended infrastructure function
- O8 Prevent or reduce flooding
- O9 Protect infrastructure

Operation and Maintenance Practices

Inspection

Inspect catch basins at least once per year. All catch basins within the City should be inspected within a 5-year period.

Periodically inspect the catch basin and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Act to have the pollutant source removed.

Cleaning

Clean catch basins when they become one third full to maintain sediment-trapping capacity. Catch basin and manhole cleaning should be performed in a manner that keeps removed sediment and water from being discharged back into the storm sewer.

Clean materials from catch basins when discovered or reported.

Keep the inlet cleared of debris and litter.

Safety

Work inside underground structures requires special OSHA-required confined space equipment and procedures.

Materials Handling

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Removed sediment must be disposed of in the garbage as solid waste. Water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or

other mechanical means. Used oil absorbents should be recycled or disposed according the manufacturer's instructions.

Repairs

Repair any damages that prevent the catch basin from functioning as designed. An example is broken or missing outlet elbow.

Follow the practices described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Manual Reference: Chapter 5, Appendix A, Section 5 (page 5A-8).

DEBRIS BARRIERS/TRASH RACKS

Trash racks are barred covers to pipe openings. They prevent large objects from entering pipes and keep pets and people out of pipes.

Outcomes

O1	Avoid or minimize sediment and pollutant discharges from the work area
O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
O5	Protect public safety and health
O6	Prevent catastrophic infrastructure failures
O7	Maintain or restore the intended infrastructure function
O8	Prevent or reduce flooding
O9	Protect infrastructure

Operation and Maintenance Practices

Inspection

Inspect trash racks at least once per year.

Cleaning

Clean trash racks when debris is plugging more than 20 percent of the openings.

Repairs

Immediately replace missing racks and missing bars.

Replace bars that are deteriorated to the point where they may be easily removed.

Bend bent bars back into position.

Follow the practices described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Manual Reference: Chapter 5, Appendix A, Section 6 (page 5A-9).

ENERGY DISSIPATERS

Energy dissipaters are critical for preventing erosion at storm drain outfalls. There are a variety of designs including wire gabion baskets, rock splash pads, trenches, and specially designed pools or manholes.

Outcomes

- O1 Avoid or minimize sediment and pollutant discharges from the work area
- O2 Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
- O7 Maintain or restore the intended infrastructure function
- O8 Prevent or reduce flooding
- O9 Protect infrastructure

Operation and Maintenance Practices

Inspection

Inspect at least once per year.

Cleaning

Dispersion Trench: Remove sediment from pipe when it reaches 20 percent of pipe diameter.

Repairs

Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Rock Pads: Replace missing or moved rock to cover exposed soil and meet design standards.

Dispersion Trench: Repair conditions that cause concentrated flow along the trench.

Clean pipe perforations when one half of them are plugged or if flows bypass or overflow the trench.

Manhole/Chamber: When the structure deteriorates to one half its original size, or it becomes structurally unsound, replace it to the design standards.

Manual Reference: Chapter 5, Appendix A, Section 7 (page 5A-10).

FENCES, GATES, AND WATER QUALITY SIGNS

Stormwater facilities such as infiltration ponds or treatment ponds often have fences to protect them from damage and keep children away from ponds or hazardous areas. Certain facilities such as biofiltration swales, approved by the City, may also be required to have informational signs telling the public that the swale is a stormwater facility.

Outcomes

O5 Protect public safety and health
O7 Maintain or restore the intended infrastructure function
O9 Protect infrastructure

Operation and Maintenance Practices

Inspection

Inspect fences, gates, and water quality signs when facilities are maintained.

Repairs

Repair any opening that allows entry into the facility.

Close any opening that allows access beneath a fence

Replace any missing gates.

Repair broken gate hinges or gates which do not close and lock properly.

Replace any missing signs or signs that have more than 20 percent unreadable surface.

Repair sign posts that lean more than 8 inches off vertical.

ACCESS ROADS AND EASEMENTS

Many stormwater facilities have access roads to bring in heavy equipment for facility maintenance. These roads should be maintained for inspection access and ease of equipment access.

Outcomes

- O1 Avoid or minimize sediment and pollutant discharges from the work area
- O2 Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
- O7 Maintain or restore the intended infrastructure function
- O10 Meet public expectations for aesthetics

Operation and Maintenance Practices

Inspection

Inspect once a year or when facilities are maintained.

Cleaning

Remove litter when mowing or litter accumulation exceeds 1 cubic foot (about one and a half 5-gallon buckets) per 1,000 square feet.

Remove any debris that blocks roads or may damage tires.

Vegetation Management

Manage vegetation as for the rest of the facility. Trees and shrubs may be removed from access roads and easements if they block access for necessary maintenance or will prevent or harm intended stormwater facility function.

Repairs

Correct any bare or eroded soils by seeding or cover BMP.

Repair road surfaces when they may lead to erosion or limit equipment access.

MANHOLES

Manholes are large cylindrical vaults usually set at storm sewer pipe connections. Unless you have OSHA approved training and equipment, never enter a manhole. There is a considerable risk of poisonous gas and injury.

Outcomes

- O1 Avoid or minimize sediment and pollutant discharges from the work area
- O2 Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
- O7 Maintain or restore the intended infrastructure function

O8 Prevent or reduce flooding
O9 Protect infrastructure

Operation and Maintenance Practices

Inspection

Inspect manholes once per year. All manholes within the City shall be checked within a 5-year period. Check the frame and lid for cracks and wear, such as rocking lids or lids moved by traffic. Periodically inspect the manhole and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

Cleaning

Clean manholes when there is a blockage of a water flow path. Cleaning should be performed in a way that ensures removed sediment and water is not discharged back into the storm sewer.

Safety

Work inside underground structures requires special OSHA-required confined space equipment and procedures. The most practical option may be to contract with a sewer-cleaning contractor.

Materials Handling

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Removed sediment must be disposed in the garbage as solid waste. Water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions.

Repairs

Repair all security and access features so they are fully functional. This includes locking lids, covers, and ladder rungs. Replace broken parts or lids that rock or are moved by traffic.

Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Manual Reference: Chapter 5, Appendix A, Section 5 (page 5A-8).

OIL/WATER SEPARATORS AND BURIED WET VAULTS

An oil/water separator is an underground vault that treats stormwater by mechanically separating oil from water. The oil rises to the surface and floats on the water and sediment settles to the bottom. Buried wet vaults are similar to oil/water separators in that they are subsurface vaults that separate sediment and floating materials from stormwater.

These facilities have special problems for maintenance and should be serviced by contractors. The main issues are working in confined spaces and properly handling any sludge and oil cleaned from vaults or oil/water separators.

Outcomes

O1	Avoid or minimize sediment and pollutant discharges from the work area
O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
O7	Maintain or restore the intended infrastructure function
O9	Protect infrastructure

Operation and Maintenance Practices

<u>Inspection</u>

Periodically check stormwater flow out of the facility. It should be clear and not have a thick, visible oil sheen.

Annually check for cracks large enough to let soil enter the vault, broken or defective plates and baffles, and crushed or damaged pipes.

Periodically inspect the surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

Inspect water levels after an extended dry period to check for leakage.

<u>Cleaning</u>

Remove trash and litter from the vault, inlet and piping.

Remove oil when it reaches one-inch thickness.

Remove sediment when it accumulates to 6 inches depth.

Safety

Work inside underground structures requires special OSHA-required confined space equipment and procedures. The most practical option may be to contract with a sewer-cleaning contractor.

Material Handling

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Removed sediment must be disposed in the garbage as solid waste. Water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions.

Repairs

Repair any cracked or defective plates or baffles. Cracks are repaired so that no cracks greater than 1/4 inch are present. Repair any leaks that allow water levels to drop and cause oil to be washed from the unit.

Repair all security and access features so they are fully functional. This includes locking lids, covers, and ladder rungs.

Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Manual References: Chapter 5, Appendix A, Section 10 (page 5A-13).
Chapter 5, Appendix A, Section 14 (page 5A-18).
Chapter 5, Appendix A, Section 15 (page 5A-19).

STORMFILTER^{TM} (LEAF COMPOST FILTER)

The StormFilter is a patented system for treating stormwater. The systems have evolved during the years from very simple above ground filter beds to a variety of vault devices containing cylindrical filters filled with leaf compost pellets. StormFilter facilities consist of cartridges filled with one or a combination of media. Media can be selected to target pollutants specific to a particular site. The cartridges are housed in pre-cast or cast in place concrete vaults or in a steel catch basin configuration. Each configuration uses

baffles to promote settling of solids and separation of oils and other floatable materials. The majority of pollutants are captured by the media and held in the cartridges. Some additional settling will occur in the inlet and cartridge bays of each vault.

The manufacturer has a detailed maintenance manual for these facilities. That manual should be used. The following practices are general requirements.

Outcomes

O1	Avoid or minimize sediment and pollutant discharges from the work area
O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
O7	Maintain or restore the intended infrastructure function
O9	Protect infrastructure

Operation and Maintenance Practices

Inspection

Inspect the StormFilter every six months. The inspection should determine sediment depth and the specific maintenance and repairs needed.

Annually check for cracks large enough to let soil enter the vault, broken or defective plates and baffles, and crushed or damaged pipes.

Periodically inspect the catch basin and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

Cleaning

Remove trash and litter from the vault, inlet and piping.

Remove sediment when it accumulates to 6 inches depth in settling chambers.

Remove sediment when it exceeds 0.25 inches on filter media.

Safety

Work inside underground structures requires special OSHA-required confined space equipment and procedures. The most practical option may be to contract with a sewer-cleaning contractor.

Material Handling

Disposal of waste from maintenance of drainage facilities shall be conducted 'in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Removed sediment must be disposed in the garbage as solid waste. Water should be disposed of in a sanitary sewer after oils; are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions.

Return used compost or canisters to the manufacturer for proper disposal or dispose of them in the garbage as solid waste.

Repairs

Repair any cracked or defective plates or baffles. Cracks are repaired so that no cracks greater than 1/4 inch are found.

Replace media cartridges if it takes longer than an hour for water to empty through media or if water frequently overflows the treatment chamber. Replace defective cartridges.

Repair all security and access features so they are fully functional. This includes locking manhole lids, covers, and ladder rungs.

Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Manual Reference: Chapter 5, Appendix A, Section 13 (page 5A-17).

CATCH BASIN INSERTS

Catch basin inserts are becoming more widely used to trap sediment and oil entering catch basins. Most involve some type of filter media and oil-absorbent pads. Filters avoid flooding by overflowing when they become clogged or there are high storm flows.

Outcomes

- O1 Avoid or minimize sediment and pollutant discharges from the work area
- O2 Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
- O7 Maintain or restore the intended infrastructure function
- O9 Protect infrastructure

Operation and Maintenance Practices

Inspection

Inspect following the manufacturer's specifications. During the wet season (October through April), inserts should be inspected once every 2 weeks. Two-week inspection can determine if a longer inspection interval is appropriate at a specific site. During the dry season, inspect them at least every 2 months.

If inserts are used for trapping sediment on a construction project, they should be inspected after every major storm.

Periodically inspect the catch basin and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

Cleaning

Generally, the filter media is removed, then cleaned or disposed. It is easier to remove the filter after it has drained and dried. If this is not possible, consider contracting the service or dewatering the filter in a container.

Remove trash and litter from the filter.

If discharges have an oily sheen, replace the oil-trapping media. If the oil trapping media is full, remove it and replace it with a new one or if manufacturer's specifications allow, clean and replace it.

If sediment clogs media, clean it following manufacturer's specifications or replace the filter.

Material Handling

Persons handling used filters should wear rubber gloves and safety protection.

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Removed sediment must be handled and disposed of in the garbage as solid waste. Water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions.

Repairs

Replace any media after typical service life.

Manual Reference: Chapter 5, Appendix A, Section 16 (page 5A-20).

STORMWATER BIOFILTRATION SWALES

Biofiltration swales use grass or other dense vegetation to filter sediment and oily materials out of stormwater. Usually they look like flat-bottomed channels with grass or other vegetation growing in them. Swales are stormwater treatment devices that must be properly maintained to sustain pollutant removal capacity.

Outcomes

O1	Avoid or minimize sediment and pollutant discharges from the work area
O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
O7	Maintain or restore the intended infrastructure function
O10	Meet public expectations for aesthetics

Operation and Maintenance Practices

Inspection

Swales are easy to inspect and need to be well maintained to treat stormwater. Every 9 months, make frequent visual inspections for problems such as channeling flow, rills, bare ground, sediment and oily material.

Identify and remove pollutant sources discharging to the swale.

Cleaning

Clear inlets and outlets to prevent blockage.

Remove litter when mowing or litter accumulation exceeds two inches.

Use a rake and shovel to hand remove sediment accumulations greater than 2-inches thick that cover grass areas, avoiding vegetation removal.

Vegetation Management

Mow to keep grass at the optimum height (6 inches). Mow to no less than 4 inches height and a minimum of four cuttings per year.

Remove clippings from the treatment area in the base of the swale. Clippings may be raked or blown onto the side slopes. If the swale has vertical walls or no side-slopes, the clippings must be removed.

Preserve healthy vegetation or reestablish vegetation where needed. Seed bare spots.

Use cover BMPs on bare soils. BMPs include hydroseeding or mulches.

Trees and shrubbery should be allowed to grow unless they interfere with facility function or maintenance activities. Any cut trees should be salvaged for habitat enhancement or converted to mulch or firewood.

Stormwater control facilities are, in effect, water body buffers where pesticides and fertilizer are not used. See Vegetation Management in Stormwater Control Facilities for more information.

Repairs

Often swales have problems due to flooding or erosion. Where possible, correct the underlying problem before trying to repair the symptom.

Level spreaders must be in proper working order for swales to function properly. Where level spreaders are damaged, sunken, or bypassed by erosion, repair them to design standard.

If there is a problem with grass dying due to the swale being flooded during the wet season, there are two options: convert the swale to plant varieties that can stand being flooded or find a way to fix the swale so it drains better.

Manual Reference: Chapter 5, Appendix A, Section 8 (page 5A-11).

WET BIOFILTRATION SWALES AND TREATMENT WETLANDS

Wet biofiltration swales and treatment wetlands use dense wetland vegetation and settling to filter sediment and oily materials out of stormwater. These stormwater treatment devices must be properly maintained to sustain pollutant removal capacity. In some cases, biofiltration swales that were designed to drain between storms remain wet and need to be rebuilt or converted to wetland swales. A designed wet biofiltration swale uses wetland plants instead of grass.

Outcomes

O1 Avoid or minimize sediment and pollutant discharges from the work area
O2 Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources

O7 Maintain or restore the intended infrastructure function
O10 Meet public expectations for aesthetics

Operation and Maintenance Practices

Inspection

Swales are easy to inspect and need to be well maintained to treat stormwater. Every 9 months, make visual inspections for problems such as bare ground, sediment and oily material.

Identify and remove pollutant sources to the swale.

Cleaning

Clear inlets and outlets to prevent blockage.

Remove litter and trash when accumulation exceeds 1 cubic foot (about one and a half, 5-gallon buckets) per thousand square feet.

Where possible, use a rake and shovel to hand remove sediment accumulations greater than 2-inches thick in 10 percent of the treatment area.

Vegetation Management

Sparse vegetation or dense clumps of cattail do not properly treat stormwater. Try to find the cause of the problem and fix it to ensure dense vegetation. Cut back excessive cattail shoots. Normally, wetland vegetation does not need to be harvested unless there is an excessive die back that causes water quality problems.

If there is a problem with grass dying due to the swale being flooded during the wet season, there are two options: plant varieties that can stand being flooded or find a way to fix the swale so it drains better.

Outside of the treatment area, preserve healthy vegetation or reestablish vegetation where needed. Seed bare spots. Use cover BMPs on bare soils.

Trees and shrubbery should be allowed to grow unless they interfere with facility function or maintenance activities. Any cut trees should be salvaged for habitat enhancement or converted to mulch or firewood.

Stormwater control facilities are, in effect, water body buffers where pesticides and fertilizer are not used. See Vegetation Management in Stormwater Control Facilities for more information.

Repairs

Often swales have problems due to flooding or erosion. Where possible, correct the underlying problem before trying to repair the symptom.

Repair any defect that causes the wet swale to dry out during the wet season.

Replace stormwater facility signs that are broken, damaged, or stolen.

Manual Reference: Chapter 5, Appendix A, Section 1 (page 5A-1).

DETENTION PONDS

Detention facilities are designed to hold and slowly release stormwater by use of a pond and specially designed control structure. Styles vary greatly from well-manicured to natural appearing. Generally, more natural-appearing vegetation is preferred for reduced maintenance and wildlife habitat. Some facilities are designed to appear as natural water bodies or are in park-like areas.

Outcomes

O1	Avoid or minimize sediment and pollutant discharges from the work area
O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
O3	Avoid or minimize vegetation removal
O7	Maintain or restore the intended infrastructure function
O8	Prevent or reduce flooding
O10	Meet public expectations for aesthetics

Operation and Maintenance Practices

Inspection

On an annual basis, identify and report pollutant sources to the facility. Inspect the facility for oil and other pollutants and remove any pollutants greater in volume than a surface sheen.

Cleaning

Trash is removed when it exceeds 1 cubic foot per 1,000 square feet.

Remove sediment when it accumulates to 10 percent designed pond depth.

Material Handling

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Vegetation Management

Where a facility has natural area, vegetation management should be timed to avoid or minimize impacts on wildlife. An example is facilities used by breeding birds such as red-winged black birds.

Mow or control vegetation to match surrounding area or sustain any other intended use of the facility, such as wildlife habitat or recreation.

Stormwater control facilities are, in effect, water body buffers in which pesticides and fertilizer are not used.

Use mechanical methods to control weeds. Pesticides, herbicides and fertilizers are not used in stormwater control facilities. See the activity: Vegetation Management in Stormwater Control Facilities for more information.

Trees should not be allowed to grow on emergency overflows and berms that are over 4 feet high. Trees can block flows and roots can lead to berm failure. Remove any trees. Remove larger roots (where the base of the tree is greater than 4 inches) and restore the berm.

Trees and shrubbery should be allowed to grow unless they interfere with facility function or maintenance activities. Any cut trees should be salvaged for habitat enhancement or converted to mulch or firewood.

Repairs

Repair and seed bare areas. Repair eroded slopes when rills form, where the cause of damage is present, or there is potential for future erosion. Use cover BMPs on exposed soils.

Level spreaders must be in proper working order to function properly. Where level spreaders are damaged, sunken, or bypassed by erosion, repair them to design standard.

Rodent holes on a dam or berm can pipe water. Destroy the rodents, preferably by trapping, and repair the dam or berm.

Repair the liner if it is visible and repair or replace where there are more than three holes greater than 1/4-inch diameter.

If berms or dams show signs of settlement or sinkholes, serious problems may be occurring. Consult a licensed professional engineer to determine the cause of the settlement or sinkhole.

Spillway areas should be completely covered by more than one layer of rock.

Manual Reference: Chapter 6, Appendix A (page 6A-2).

DRYWELLS

Drywells are perforated, open-bottomed manholes used to infiltrate stormwater into the ground. While not the intended use, drywells trap sediment and some of the oily pollutants in runoff. Drywells are more likely to fill with oily sediment in areas that lack swales or other treatment facilities. Fine oil sediment can clog drywells and lead to localize street flooding. Also, pollutants discharged into drywells can migrate into groundwater. Drywells were often installed in closed topographic depressions, areas with well-drained soils, or areas having inadequate storm sewers. Often, drywells contain groundwater.

Because drywells can be easily clogged and tend to concentrate pollutants in one place; pollution and sediment control practices should be used to protect them.

Outcomes

- O1 Avoid or minimize sediment and pollutant discharges from the work area
- O2 Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
- O7 Maintain or restore the intended infrastructure function
- O8 Prevent or reduce flooding
- O9 Protect infrastructure

Operation and Maintenance Practices

<u>Inspection</u>

Drywells should be inspected at least once a year and no less than once every 5 years.

Periodically inspect the drywell and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

If a problem with flooding or slow drainage occurs, observe or inspect the drywell for infiltration rate and observe water level depths if monitoring wells are installed.

Cleaning

Clean out drywells when sediment depth is greater than 1/3 of the distance between the base and inlet pipe.

Drywell cleaning should be performed in a way that makes certain removed sediment and water is not discharged back into the storm sewer.

Safety

Work inside underground structures requires special OSHA-required confined space equipment and procedures. The most practical option may be to contract with a sewer-cleaning contractor.

Material Handling

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Removed sediment must be disposed in the garbage as solid waste. Water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions.

Repairs

Work in drywells requires special OSHA-required confined space equipment and procedures. The most practical method for cleaning drywells may be to contract with a sewer-cleaning contractor.

If the drywell does not dissipate stormwater, it should be replaced or repaired.

It is possible to restore some drywell capacity by water-jetting clogged openings.

Another option is installing a new drywell or drainage trench, and converting the clogged drywell into a sediment trap. This has the advantage of providing a sediment trap and some amount of spill trapping. The sediment trap conversion requires grouting the holes, covering the base with concrete, and adding piping.

If there is standing water in a drywell, it probably is into the water table. Drywells in the water table should be rebuilt to prevent stormwater from going directly into groundwater.

Repair all security and access features so they are fully functional. This includes locking lids, covers, and ladder rungs.

Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Manual Reference: Chapter 6, Appendix A (page 6A-9).

DRAINAGE TRENCHES

Drainage trenches are subsurface gravel-lined drain fields built to infiltrate stormwater into the ground. They have a large, perforated pipe in a bed of sorted gravel. Fine, oily sediment can clog drainfields and lead to localized street flooding. Also, pollutants discharged into drainfield can migrate into groundwater. Drainage trenches were often installed in closed topographic depressions, areas with well-drained soils, or areas having inadequate storm sewers.

Outcomes

O1	Avoid or minimize sediment and pollutant discharges from the work area
O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
O7	Maintain or restore the intended infrastructure function
O8	Prevent or reduce flooding
O9	Protect infrastructure

Operation and Maintenance Practices

<u>Inspection</u>

Some drainage trenches have special inspection wells or clean out manholes. They should be inspected at once a year and no less than once every 5 years.

A thorough inspection of the observation points should be made if there is a decrease in capacity. Inspection points can include: inspection ports, monitoring ports built into the trench, and water table depth monitoring wells. Water levels in these inspection points can provide information about the performance of the facility.

If there is a problem with flooding or slow drainage, the facility design rate needs to be verified. If there are monitoring tubes in the drain field, use them to observe infiltration rates.

Periodically inspect the surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

Cleaning

If a drainage trench begins to clog, try cleaning the perforated drainpipe.

Cleaning should be performed in a way that makes certain removed sediment and water is not discharged back into the storm sewer.

Safety

Work inside underground structures requires special OSHA-required confined space equipment and procedures. The most practical option may be to contract with a sewer-cleaning contractor.

Material Handling

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Removed sediment must be disposed in the garbage as solid waste. Water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according the manufacturer's instructions.

Repairs

Repairing a clogged drainage trench will involve excavation and replacement of part or all of the facility.

Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Manual Reference: Chapter 6, Appendix A (page 6A-10).

INFILTRATION BASINS/PONDS

Infiltration facilities dispose of water by holding it in an area where it can soak into the ground. These are open facilities that may either drain rapidly and have grass bases, or have perpetual ponds where water levels rise and fall with stormwater flows. Infiltration

facilities may be designed to handle all of the runoff from an area or they may overflow and bypass larger storms.

Since the facility is design to pass water into the ground, anything that can cause the base to clog will reduce performance and is a large concern. Generally, infiltration basins are managed like detention ponds but with greater emphasis on maintaining the capacity to infiltrate stormwater.

Outcomes

O1	Avoid or minimize sediment and pollutant discharges from the work area
O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
O3	Avoid or minimize vegetation removal
O7	Maintain or restore the intended infrastructure function
O8	Prevent or reduce flooding
O10	Meet public expectations for aesthetics

Operation and Maintenance Practices

Inspection

Check once per year after a rainstorm to see if the facility is draining as intended. Inspect annually for all features.

A thorough inspection of the observation points should be made if there is a decrease in retention basin capacity. Inspection points can include monitoring ports built into the base of the facility and water table depth monitoring wells. Water levels in these inspection points can provide information about the performance of the facility. It will probably require a licensed professional engineer or other professional trained in hydraulics to interpret the information.

Identify and remove pollutant sources to the facility. Inspect the facility for oil and other pollutants and remove any pollutants greater in volume than a surface sheen.

Cleaning

Trash is removed when it exceeds 1 cubic foot per 1,000 square feet.

Remove sediment when it accumulates to 2 inches or if the facility does not drain between storms or meet 90 percent of design capabilities.

If the facility has a sediment trap, clean out the sediment when one-half foot accumulates.

Materials Handling

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Vegetation Management

Mow or control vegetation to match surrounding area or sustain any other intended use of the facility, such as wildlife habitat or recreation.

Stormwater control facilities are, in effect, water body buffers where pesticides and fertilizer are not normally used. See the activity Vegetation Management in Stormwater Control Facilities for details.

Use mechanical methods to control weeds. Pesticides, herbicides and fertilizers are not normally used in stormwater control facilities.

Trees should not be allowed to grow on emergency overflows and berms that are over 4-feet high. Trees can block flows and roots can lead to berm failure. Remove any trees. Remove larger roots (where the base of the tree is greater than 4 inches) and restore the berm.

Trees and shrubbery should be allowed to grow unless they interfere with facility function or maintenance activities. Any cut trees should be salvaged for habitat enhancement or converted to mulch or firewood.

Repairs

If the facility is overflowing for storms it was designed to infiltrate, it needs to be repaired. This requires removing accumulated sediment and cleaning or rebuilding the system so that it works according to design.

Repair and seed bare areas. Repair eroded slopes when rills form, where the cause of damage is still present, or there is potential for future erosion. Use cover BMPs on exposed soils.

Rodent holes on a darn or berm can pipe water. Destroy rodents, preferably by trapping, and repair the dam or berm.

Spillway areas should be completely covered by more than one layer of rock.

Manual Reference: Chapter 6, Appendix A (page 6A-10).

CLOSED DETENTION SYSTEMS IN TANKS OR VAULTS

Underground tanks or vaults usually are placed under paved areas. They are hold and slowly release stormwater runoff from roofs and pavement.

Tanks and vaults are confined spaces where work requires special OSHA approved training and equipment.

Outcomes

O1	Avoid or minimize sediment and pollutant discharges from the work area
O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
O7	Maintain or restore the intended infrastructure function
O9	Protect infrastructure

Operation and Maintenance Practices

Inspection

Inspect annually for the features listed under Cleaning and Repairs.

Periodically inspect the facility and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

Cleaning

Remove trash and litter from the vault, inlet and piping.

Clean air vents that have one half of their area plugged.

Remove sediment when it accumulates to $1/10^{th}$ the depth of a rectangular vault or $1/10^{th}$ the diameter of a round tank or pipe.

Safety

Work inside underground structures requires special OSHA-required confined space equipment and procedures. The most practical option may be to contract with a sewer-cleaning contractor.

Material Handling

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional

Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Removed sediment must be handled and disposed of in the garbage as solid waste. Water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions.

Repairs

Repair any cracked or defective plates or baffles. Cracks are repaired so that no cracks greater than 1/4 inch are found.

Any part of a tank or pipe that is bent out of shape more than 10 percent of its design shape must be replaced or repaired.

Repair any joints that are cracked and allow soil into the facility.

Repair all security and access features. This includes locking lids, covers, and ladder rungs.

Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Manual Reference: Chapter 6, Appendix A (page 6A-5).

FLOW CONTROL STRUCTURES/FLOW RESTRICTORS

Flow control structures and flow restrictors direct or restrict flow in or out of facility components. Outflow controls on detention facilities are a common example where flow control structures slowly release stormwater at a specific rate. If these flow controls are damaged, plugged, bypassed, or not working properly, the facility could overtop or be releasing water at too high of a rate. This will likely damage streams habitat and property. Site plans should have detailed drawings showing how the flow control structures should appear. Consult a licensed professional engineer for assistance.

Outcomes

- O2 Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
- O7 Maintain or restore the intended infrastructure function
- O9 Protect infrastructure

Operation and Maintenance Practices

Inspection

Inspect at least once per year for all features listed under Cleaning and Repairs, or when a facility does not drain properly or other problems occur.

Cleaning

Remove sediment within 1.5 feet of the bottom of an orifice plate.

Remove trash and debris that may block the orifice plate.

Remove any trash or debris that may block an overflow pipe.

Safety

Work inside underground structures requires special OSHA-required confined space equipment and procedures. The most practical option may be to contract with a sewer-cleaning contractor.

Material Handling

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Removed sediment must disposed in the garbage as solid waste. Water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions.

Repairs

Repair or replace to original design specification any outlet orifice that is enlarged, bypassed or damaged.

Make certain that overflow outlets are not blocked.

Structures should be securely in place and within 10 percent of vertical.

Repair outlet pipe structures that have leaking connections or holes not specified by the design.

Repair or replace a non-functional or damaged cleanout gate.

Repair or replace damaged orifice plates to original design specification.

No outflow controls can be modified without approval of a Public Works Department engineer.

Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Manual Reference: Chapter 6, Appendix A (page 6A-6).

STORM PIPE

Storm sewer pipes convey stormwater. Pipes are built from many materials and are sometimes perforated to allow stormwater to infiltrate into the ground. Storm pipes are cleaned to remove sediment or blockages when problems are identified. Storm pipes must be clear of obstructions and breaks to prevent localized flooding.

Outcomes

O1	Avoid or minimize sediment and pollutant discharges from the work area
O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
O7	Maintain or restore the intended infrastructure function
O8	Prevent or reduce flooding
O9	Protect infrastructure

Operation and Maintenance Practices

<u>Inspection</u>

Pipes are difficult to inspect, requiring special equipment and training. Usually, if a problem occurs the owner needs to call a sewer or plumbing contractor to inspect, repair or clean pipelines.

<u>Cleaning</u>

Clean pipes when sediment depth is greater than 20 percent of pipe diameter. When cleaning a pipe, minimize sediment and debris discharges from pipes to the storm sewer. Install downstream debris traps (where applicable) before cleaning and then remove material.

Generally, use mechanical methods to remove root obstructions from inside storm sewer pipes. Do not put root-dissolving chemicals in storm sewer pipes. If there is a problem, remove the vegetation over the line.

Safety

Work inside underground structures requires special OSHA-required confined space equipment and procedures. The most practical option may be to contract with a sewer-cleaning contractor.

Materials Handling

Sediment and debris from pipes should be disposed in the garbage as solid waste. Pick out any rocks first.

Repairs

Repair or replace pipes when a dent or break closes more than 20 percent of the pipe diameter.

Repair or replace pipes damaged by rust or deterioration.

Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

DRY DRAINAGE DITCHES

Ditches are manmade open channels that carry only stormwater. This does not include ditches that have water flowing in them during dry weather.

Ditches are often maintained for drainage to prevent localized flooding by draining stormwater. Maintenance includes removing sediment, debris and overgrown vegetation.

Protecting water quality dictates minimizing vegetation removal and preventing erosion.

Outcomes

- O1 Avoid or minimize sediment and pollutant discharges from the work area
- O2 Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
- O3 Avoid or minimize vegetation removal
- O4 Preserve native plants
- O7 Maintain or restore the intended infrastructure function
- O8 Prevent or reduce flooding
- O9 Protect infrastructure

Operation and Maintenance Practices

Inspection

Inspect ditches during routine site maintenance or at least once per year.

Cleaning

Land disturbing activities that remove vegetation or disturb soil are subject to City erosion control requirements. A good time to clean is during the growing season, when it's easiest to reestablish vegetation. This is generally April through June and September through October.

If feasible, remove small amounts of sediment by hand when performing routine site maintenance.

Vegetation should only be removed when it reduces free movement of water through the ditch. Never remove more vegetation than is absolutely needed.

Only remove sediment when it reaches 20 percent of the ditch depth or affects the historic or designed hydraulic capacity.

Alternate cleaning areas with undisturbed areas, leaving undisturbed sections to act as sediment-trapping filters between worked areas.

Trap sediment that is generated by ditch maintenance to keep it from entering water bodies. Use sediment-trapping BMPs such as fabric fencing or filter bags at the lower end of each excavated area

Prevent sediment from eroding when ditch work is performed. Perform work during dry weather unless there is an emergency such as property or road flooding.

Vegetate bare soils by hydroseeding or cover bare soils with an approved BMP. Hand seed for smaller areas.

WATER-BEARING (BASE FLOW) DRAINAGE DITCHES

Many manmade drainage ditches carry water when it is not raining. This water comes from groundwater seeps and wetlands. These ditches can be recognized by the presence of wetland plants such as cattails. Any work that disturbs these channels is probably subject to a variety of environmental regulations and will probably require an HPA permit from the Washington Department of Fish and Wildlife.

Water-bearing drainage ditches require permits for work. Requirements of county, state, and federal laws and permits may apply. Contact the Washington Department of Fish and Wildlife before beginning work.

INSTALLATION, REPAIR AND REPLACEMENT OF ENCLOSED DRAINAGE SYSTEMS

This activity includes tasks such as repair and replacement of pipe, catch basins, drywells and manholes. It also includes drainage projects that add new pipes, catch basins, or infiltration structures. New drainage projects are subject to regulations under City Code. Source control BMPs are required for activities such as concrete cutting.

Outcomes

O1	Avoid or minimize sediment and pollutant discharges from the work area
O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming Pollutant sources
O7	Maintain or restore the intended infrastructure function
O8	Prevent or reduce flooding

Practices

Avoid or minimize vegetation removal.

If work is performed under contract, specify BMP performance under inspection/contract administration.

Prevent debris, oils, cleaning agents, and sediment from entering waterways.

Avoid or minimize work in wet weather. This will reduce the problems of containing sediment.

Carry spill control kit to contain and clean up possible small spills in the work area.

Protect storm drains.

- Cover storm sewer inlets, catch basins and open manholes to block sediment-bearing water.

- If runoff contains sediment, use gravel-filled filter bags or an equivalent product to build berms around inlets. Gravel-filled bags are more stable than chip-filled bags.

- Catch basin inserts are also an acceptable sediment trapping option.

At stream crossings, trap materials using screens or another form of containment. Use containment BMPs to protect roadside ditches during wet weather.

Avoid using water to clean up work sites. Sweep or vacuum dust and debris from the repair job. Do not wash materials into storm sewers.

Place stockpiles away from drainage ways, wetlands, and natural wetland and habitat buffers. Cover stockpiles or contain them with berms or other containment devices if there is a chance that materials will erode into a storm drain or water body.

MINOR CULVERT REPAIR (NOT IN A STREAM)

This activity is the replacement or repair of culverts and inlets less than 6 feet in diameter. It applies only to structures that are in ditches but specifically for drainage that do not carry water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, consult with the Washington Department of Fish and Wildlife.

Outcomes

O1 Avoid or minimize sediment and pollutant discharges from the work area
O3 Avoid or minimize vegetation removal
O7 Maintain or restore the intended infrastructure function
O8 Prevent or reduce flooding
O9 Protect infrastructure

Maintenance Practices

Comply with stormwater and erosion control requirements of the City Code.

Avoid or minimize vegetation removal.

Other than to address a threat to public safety or property due to flooding, perform work during the dry season.

Minimize soil disturbance.

Use sediment controls to trap any sediment and prevent sediment from entering storm sewer and water bodies. Sediment trapping BMPs are used to the extent practical during emergencies.

Use cover BMPs to prevent erosion of bare soil. Vegetate bare soils.

PAVEMENT SWEEPING

Sweeping is performed to remove sand and litter from streets and curb gutters. Sweeping also reduces dust during dry weather. Street sweeping is also storm sewer maintenance practice because it limits sediment washed into stormwater facilities. Water quality practices for street sweeping focus on sediment disposal. Reducing the amount of sediment washed into catch basins, detention facilities, drywells, and other facilities can save money because sweeping is generally cheaper than removing sediment from facilities. Sweeping also helps protect facilities from clogging with sediment.

Outcomes

O2	Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
O5	Protect public safety and health
O10	Meet public expectations for aesthetics

Practices

Sweep the site if it will help keep sediment and from storm sewers or water bodies. Sweeping is especially useful for cleaning up work areas.

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Sweepings should be disposed of as solid waste or under a program permitted by the State or County Department of Health.

ROAD OPERATION AND MAINTENANCE

Road maintenance activities include just routine maintenance activities on roads, roadsides and bridges or stream culverts. It includes activities such as sweeping, roadside vegetation management, ditch cleaning, clearing debris from culverts and de-icing.

The overall goal of water quality BMPs for road O&M is to make sure that:

- Systems that control pollutants, such as vegetation in roadside ditches are preserved
- Work on roads does not become a source of pollutants such as sediment.
- Activities near sensitive areas such as stream buffers and wetland buffers follow habitat protection procedures
- Sources of pollutants to roadside ditches are identified and removed.

ACTIVITY: STREET SWEEPING (VACUUM PICKUP)

Street sweeping is performed largely for aesthetics and to remove sand and litter sediment from streets and curb gutters. Street sweeping is a water quality BMP. Water quality practices for street sweeping focus on sediment disposal.

Outcomes

- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O5 Protect public safety and health
- O10 Meet public expectations for aesthetics

Practices

Sweepings are disposed as provided for by the Washington Department of Ecology and State or County Department of Health requirements. Sweepings are screened to separate litter and trash (disposed as solid waste), then used as reclamation fill in permitted gravel pits.

ACTIVITY: SWEEPING (NON-PICK UP)

This form of sweeping brushes debris off the road surface, onto road shoulders, and into the ditch sides.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O5 Protect public safety and health
- O10 Meet public expectations for aesthetics

Practices

Do not sweep debris into wet ditches (storm or base flow) or into streams, ponds, or wetlands. Sweep debris into vegetated areas of shoulder or ditch.

Vacuum sweepers are used on bridges, and within 250 feet of water bodies, streams and wetlands.

ACTIVITY: ROADSIDE MOWING

Mowing maintains sight distances, promotes grass growth and controls unwanted vegetation. It can include mowing of grass, brush and shrubbery.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O3 Minimize vegetation removal
- O4 Preserve native plants
- O5 Protect public safety and health
- O10 Meet public expectations for aesthetics

Practices

Perform mowing to the extent needed to control unwanted vegetation. Natural vegetation is left in place to the extent possible, considering safety issues for visibility and the need to maintain ditch flow capacity.

Minimize mowing to the backslope to include areas where noxious weeds or unwanted vegetation need to be controlled.

Roadside ditches are stormwater conveyances, and are in effect, water body buffers where pesticides and fertilizer are not normally used. See Activity: Vegetation and Pest Management in Stormwater Control Facilities for details.

In Habitat Conservation Areas where roads abut natural vegetation (not cultivated fields, lawns and pastures), mowing is restricted to the road shoulder and for control of patches of blackberries or other noxious or nuisance vegetation.

ACTIVITY: ROADSIDE CHEMICAL VEGETATION CONTROL

Weed control is performed to control noxious weeds on City right-of-way and to kill vegetation along the edge of pavement along arterial roads and major collectors, within pavement cracks, and on landscaped medians. This activity does not include maintaining stormwater swales or other vegetated stormwater facilities.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O3 Minimize vegetation removal
- O4 Preserve native plants
- O5 Protect public safety and health
- O7 Maintain or restore the intended infrastructure function
- O10 Meet public expectations for aesthetics

Practices

Chemical controls are used where it is not practical to control by mechanical removal or cultural controls.

Herbicide is sprayed to either the top of the ditch or two feet from the edge of pavement (whichever is less) to control vegetation.

Never spray herbicides into water. Many roadside ditches carry water during dry periods and can be recognized by the presence of water and wetland plants such as cattails. Do not spray herbicide in these ditches.

Within 250 feet of a water body or wetland, or within a designated Habitat Conservation Areas, follow the practices of Activity: Vegetation and Pest Management in Stormwater Control Facilities or avoid chemical applications within 100 feet of a water body.

ACTIVITY: ROADSIDE BRUSH AND TREE CLEARING

This includes mechanical, hand removal, and spot herbicide spraying of undesirable shrubs, bushes and trees along roads.

Outcomes

O1 Minimize sediment and pollutant discharges from the work area
O3 Minimize vegetation removal
O4 Preserve native plants
O5 Protect public safety and health
O9 Protect infrastructure
O10 Meet public expectations for aesthetics

Practices

Limit brush removal to the shoulder and ditch. Only remove brush and trees or branches to provide sight distance and maintain ditch flow capacity.

Do not remove native shrubs or trees within Habitat Conservation Areas, wetland buffers, or along drainage ditches that have dry weather flow unless it poses a hazard or is a nuisance or noxious weed. These ditches often have wetland plants such as cattails in them. Consult with the area supervisor before removing trees or brush within 250 feet of a stream. A habitat biologist should be consulted before removing trees in a Habitat Conservation Area.

For drainage ditches, follow the practices of Activity: Vegetation and Pest Management in Stormwater Control Facilities. For other roadside areas with natural vegetation, follow vegetation management activity: Vegetation Management in Less-Managed Areas.

Only trees that pose a danger of falling onto roadways or structures may be removed within Habitat Conservation Areas. Removed trees are replaced with the same type of

trees that cover an equal area as the canopy of the removed tree. Tree replacement is within the same basin.

If practical, hand remove weeds such as black berry vines, nightshade and scotch broom while keeping other bushes and trees.

If there is a water body or ditch with water flow during dry weather, only clear bushes when sight distance is an issue, and after checking with the area supervisor.

Cover bared soils with an erosion prevention cover BMP. Vegetate bare soils.

ACTIVITY: ROADSIDE DITCH CLEANING AND RESHAPING

This activity includes machine or hand cleaning of ditches, reshaping ditches to promote drainage, and managing any removed materials. This practice does not include ditches that have water flowing in them See the stormwater facility O&M standards for Dry Drainage Ditches.

Protecting water quality dictates minimizing vegetation removal and preventing erosion.

Outcomes

O1	Minimize sediment and pollutant discharges from the work area
O2	Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
O3	Minimize vegetation removal
O7	Maintain or restore the intended infrastructure function
O8	Prevent or reduce flooding
O9	Protect infrastructure

Practices

Use mowing as the first method to reduce capacity loss. If mowing is insufficient, use ditch cleaning methods.

Where practical, perform work during dry weather.

Only clean areas where there is a flow restriction.

Never remove more vegetation than is absolutely needed. Leave untouched sections at least 200-feet long (where feasible) to act as sediment trapping filters between cleaned sections.

Remove small amounts of sediment by hand when performing routine maintenance.

Use sediment-trapping BMPs at the lower end of each excavated area to keep it from washing out of the work area or entering water bodies.

If there are problems with steep gradient or flowing water, use a stabilization BMP such as a silt mat on the ditch bottom.

Cover bare soils with a cover BMP. Vegetate bare soils. During summer, seeding may not be feasible. Hydroseed unvegetated soils in early fall to assure growth before rainy weather begins in October.

Transport sediment to the appropriate permitted site, grading project, or gravel pit reclamation project.

Avoid work within 250 feet of a stream, wetland or Habitat Conservation Area. If work is required to solve a drainage problem in a Habitat Conservation Area, use ground cover matting to stabilize the area and sediment trapping BMPs.

ACTIVITY: CULVERT AND INLET CLEANING

This activity includes cleaning sediment and debris from culverts, inlets and other drainage structures less than 6 feet in diameter. These structures are in dry drainage ditches that do not contain water during dry weather. Cleaning is performed to restore drainage capacity using flushing equipment or hand tool.

Outcomes

O1 Minimize sediment and pollutant discharges from the work area
O3 Minimize vegetation removal
O7 Maintain or restore the intended infrastructure function
O8 Prevent or reduce flooding
O9 Protect infrastructure

Practices

Other than to address a threat to public safety or property due to flooding, perform work during the dry season.

Minimize soil disturbance. Never remove more vegetation than is absolutely needed.

Use sediment controls to trap any sediment and prevent sediment from entering storm sewer and water bodies. Sediment trapping BMPs are used to the extent practical during emergencies.

Cover bare soils with a cover BMP. Vegetate bare soils. During summer, seeding may not be feasible. Unvegetated soil will be hydro-seeded in early fall to assure growth before rainy weather begins in October.

If there are problems with steep gradient or flowing water, use a stabilization BMP such as a silt mat on the ditch bottom.

Transport sediment to the appropriate permitted site, grading project, or gravel pit reclamation project.

Avoid work within 250 feet of a stream, wetland or Habitat Conservation Area. If work is required to solve a drainage problem in a Habitat Conservation Area, use ground cover matting to stabilize the area and sediment trapping BMPs.

ACTIVITY: MINOR CULVERT REPAIR (NOT IN A STREAM)

This activity is the replacement or repair of culverts and inlets less than 6 feet in diameter. It applies only to structures that are in ditches built specifically for drainage and do not carry water during dry weather.

Outcomes

O1 Minimize sediment and pollutant discharges from the work area
O3 Minimize vegetation removal
O7 Maintain or restore the intended infrastructure function
O8 Prevent or reduce flooding
O9 Protect infrastructure

Practices

Other than to address a threat to public safety or property due to flooding, perform work during the dry season.

Minimize soil disturbance. Never remove more vegetation than is absolutely needed.

Use sediment controls to trap any sediment and prevent sediment from entering storm sewer and water bodies. Sediment trapping BMPs are used to the extent practical during emergencies.

If there are problems with steep gradient or flowing water, use a stabilization BMP such as a silt mat on the ditch bottom.

Cover bare soils with a cover BMP. Vegetate bare soils. During summer, seeding may not be feasible. Unvegetated soil will be hydro-seeded in early fall to assure growth before rainy weather begins in October.

Transport sediment to the appropriate permitted site, grading project, or gravel pit reclamation project.

Avoid work within 250 feet of a stream, wetland or Habitat Conservation Area. If work is required to solve a drainage problem in a Habitat Conservation Area, use ground cover matting to stabilize the area and sediment trapping BMPs.

ACTIVITY: EROSION REPAIR

This activity includes the clean up and repair caused by erosion or minor soil failures. It involves reshaping the slope using material on site, importing fill material and removing material.

This activity does not include larger slide or stream erosion projects, which are overseen by an engineer who specifies the BMPs.

Outcomes

O1	Minimize sediment and pollutant discharges from the work area
O2	Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
O3	Minimize vegetation removal
O4	Preserve native plants
O5	Protect public safety and health
O6	Prevent catastrophic infrastructure failures
O7	Maintain or restore the intended infrastructure function
O9	Protect infrastructure

Practices

Unless work is to address a threat to public safety or property, perform work during dry weather.

Never remove more vegetation than is absolutely necessary to complete the job.

Use sediment-trapping BMPs at the lower end of each excavated area. Trap sediment that is generated by work to keep it from entering water bodies.

Cover bare soils with a cover BMP. Vegetate bare soils.

Transport sediment to the appropriate permitted site, grading project, or gravel pit reclamation project.

Avoid work within 250 feet of a stream, wetland or Habitat Conservation Area. If work is required to solve a drainage problem in a Habitat Conservation Area, use ground cover matting to stabilize the area and sediment trapping BMPs.

ACTIVITY: EMERGENCY SLIDE/WASHOUT REPAIR

This activity is emergency actions that must be immediately taken to avoid an imminent threat to public health or safety, or to prevent an imminent threat of serious environmental degradation (Section 197-11-880 WAC).

Outcomes

O1 Minimize sediment and pollutant discharges from the work area
O5 Protect public safety and health
O6 Prevent catastrophic infrastructure failures
O7 Maintain or restore the intended infrastructure function
O9 Protect infrastructure

Practices

Install sediment control BMPs.

Use BMPs to avoid or minimize additional impacts to streams and wetlands.

If possible, divert water around the work area with temporary measures such as sandbags.

Transport sediment to the appropriate permitted site, grading project, or gravel pit reclamation project.

Install cover BMPs on bare soil and vegetate the area.

Where required, emergency permits will be obtained from appropriate agencies. Possible permits include:

- Grading
- SEPA
- Shoreline
- State HPA
- Flood Plain

ACTIVITY: CHEMICAL ROAD DEICER USE

This is a practice of using a chemical to prevent or retard ice formation on roads and structures. The primary purpose is to protect public safety.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O5 Protect public safety and health

Practices

Limit deicer use to areas where traffic hazards occur. Apply the current Washington Department of Transportation approved material.

List sites where deicer is required. Use deicer as specified in manufacturer's instructions. Follow materials storage and transfer BMPs in the Manual or City Code.

ACTIVITY: SANDING FOR ICE

Sand is used to provide traction in certain areas where snow and ice cause safety problems.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O5 Protect public safety and health

Practices

Recover and reuse sand by using pick-up sweepers in urban areas, within 250 feet of lakes, ponds and streams, and on bridges.

In rural areas, and not near a water body, sweep sand onto vegetated shoulders.

Properly store sand and use containment or covering BMPs specified in the Manual or adopted City Code.

ACTIVITY: SNOW REMOVAL

This activity is snow removal from roads, shoulders, and bridges using various snowplowing devices. Plowed snow can include sediment and debris from roads and shoulders.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O3 Minimize vegetation removal
- O4 Preserve native plants
- O5 Protect public safety and health
- O7 Maintain or restore the intended infrastructure function

Practices

Minimize the amount of sediment and debris entering water bodies. When moving snow and ice, avoid pushing or casting snow directly into a water body.

Consider the influence that plowed or cast snow has on roadside vegetation. Minimize crushing or disturbance of roadside shrubs and trees within Habitat Conservation Areas.

Reduce speed, change plow angle or use other methods to protect water bodies and sensitive habitat areas.

ACTIVITY: ROAD SURFACE MAINTENANCE

This activity includes surface repairs and paving jobs. Tasks include using asphaltic concrete, midland pavement, and other materials for patching potholes, filling cracks, paving shoulders, and overlaying roads. If the job cuts or places concrete, see the concrete work activity BMPs.

The major concern is rainfall runoff carrying oils from the work area and particles of material being washed or swept into storm drains or water bodies.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O3 Minimize vegetation removal
- O5 Protect public safety and health
- O7 Maintain or restore the intended infrastructure function
- O9 Protect infrastructure

Practices

If resurfacing work is performed under contract, specify BMP performance under inspection/contract administration.

Prevent debris, oils, cleaning agents, and sediment from entering waterways. If feasible block inlets and drains.

Avoid work in wet weather. This will reduce the problems of containing sediment or oil laden runoff from the job.

Carry spill control kit.

If the work is creating sediment or other pollutants that can be washed from the work area, protect storm drains. Use the following practices as feasible.

- Cover storm sewer inlets, catch basins and open manholes to prevent or block sediment-bearing water.
- If runoff contains oil and grease use sandbags, booms, or other absorbent products to trap oil at inlets or in drainage ditches. Use catch basin inserts with oil trapping material.
- If runoff contains sediment, use gravel-filled filter bags or other appropriate products to build berms around inlets. Gravel-filled bags are more stable than chip-filled bags.
- At stream crossings, trap materials using screens or another form of containment. Use containment BMPs to protect roadside ditches during wet weather.

Avoid using water to clean up work sites. Sweep or vacuum dust and debris from the repair job. Do not wash materials into storm sewers.

Properly contain and dispose of any residue from cleaning tools. Use heat to clean equipment where possible, avoiding solvents. If vehicles and equipment are left at the site overnight, use drip pans to contain leaks.

Minimize vehicle and equipment cleaning at the site. If cleaning is performed, dispose of cleaning residue in a sanitary sewer or into a grassy area or small temporary infiltration pit.

Place cold mix and material stockpiles away from drainage ways. Cover or contain stock piles to prevent material or residues from washing off.

Recycle asphalt and fill material when possible.

ACTIVITY: CONCRETE WORK

This activity is the installation, cutting, or repair of concrete facilities such as road surfaces, curb and gutter, sidewalks, and drainage structures.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O5 Protect public safety and health
- O7 Maintain or restore the intended infrastructure function

Practices

When necessary, place storm drain covers or containment devices over all drain inlets or discharge points at the beginning of each workday. Remove all accumulated material at the end of each workday. Properly dispose of the material.

Dispose of concrete where it will not wash into a water body, ditch or storm drain. Collect slurry from exposed aggregate washing, grinding water, and any truck washout and dispose of it properly. It is acceptable to dig a hole to hold any slurry or rinse water.

Use curing and form release materials that minimize pollutant discharge.

Do not use water to wash down the area.

ACTIVITY: SHOULDER BLADING

This activity is blading and shaping of unpaved shoulders to correct ruts, sediment accumulation, excessive plant material accumulation, and to maintain drainage from the pavement to the ditch. It usually involves work on relatively flat gravel shoulders.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O3 Minimize vegetation removal
- O5 Protect public safety and health
- O7 Maintain or restore the intended infrastructure function

Practices

Try to limit this work to dry weather.

Minimize vegetation removal. If soils are disturbed beyond the top of the ditch or on a slope, apply erosion prevention BMPs and vegetate the bare areas.

Avoid or minimize vegetation removal within Habitat Conservation Areas, and wetland buffers. Consider avoiding shoulder blading.

ACTIVITY: SHOULDER REBUILDING

This activity is an expansion from shoulder blading that involves adding material to the shoulder, reshaping, and compacting aggregate. It may also include removing material. Shoulders are generally cleared and mowed areas vegetated with grass and brush and are not specifically subject to requirements of the Habitat Conservation Ordinance.

If work will take place between the road and stream, and increases the size of the shoulder or impacts vegetation or a stream channel, consult with an engineer to determine if permits are required.

Outcomes

O1 Minimize sediment and pollutant discharges from the work area
O3 Minimize vegetation removal
O4 Preserve native plants
O7 Maintain or restore the intended infrastructure function
O9 Protect infrastructure

Practices

Use erosion controls and prevent sediment and debris from entering water bodies and wetlands. Apply sediment control BMPs at the outside edges of the work area.

Minimize vegetation removal. Avoid or minimize vegetation removal within Habitat Conservation Areas and wetland buffers.

Where possible, create a grassy vegetated slope area between the road and ditch bottom when rebuilding a shoulder.

ACTIVITY: PAVEMENT MARKING

This activity includes striping roadway surfaces and applying other markings such as hot plastic material to define special traffic control features such as crosswalks, and application of special markers using adhesives.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O5 Protect public safety and health

Practices

As current paint stocks are consumed, water based or low VOC paints replace them.

Prevent paint from entering storm sewers and water bodies. Use over-spray control.

Store paint in spill proof containers or covered areas. Clean up spills during storage and handling.

When cleaning up, use methods that properly contain and dispose of unused paint, cleaning materials, and other spent materials.

When removing markings, prevent debris from entering water bodies. Clean up debris from grinding or power washing and dispose of it according to standard procedures.

Avoid using water to clean pavement and do not wash debris into storm sewers or ditches. Protect inlets, manholes and roadside ditches during any washing activities.

ACTIVITY: SIGN INSTALLATION AND REPAIR

This activity is the routine replacement, installation, repair, straightening and cleaning of signs.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O3 Minimize vegetation removal
- O5 Protect public safety and health
- O7 Maintain or restore the intended infrastructure function

Practices

Prevent disturbed soil from entering storm sewer or surface water bodies. Seed bare soils.

Avoid discharging cleaners to storm sewers or surface water by making sure they run into vegetated areas or limiting the amount used.

Clean up any materials or debris left by the work.

Attempt to avoid placing signs in areas where there are shrubs and trees that will have to be removed and periodically cleared to keep the sign visible.

ACTIVITY: TRAFFIC SIGNAL MAINTENANCE

This activity is the routine repair and preventative maintenance of traffic signals and luminaires, including lamps, poles and bases.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O3 Minimize vegetation removal
- O5 Protect public safety and health
- O7 Maintain or restore the intended infrastructure function

Practices

Prevent disturbed soil from entering storm sewer or surface water bodies. Use sediment trapping or cover BMPs and seed bare soils.

Avoid discharging cleaners to storm sewers or surface water by making sure they run into vegetated areas or limiting the amount used.

Clean up any materials or debris left by the work.

ACTIVITY: MAINTENANCE OF POSTS, GUARDRAILS, CONCRETE BARRIERS AND OTHER ROAD FEATURES

This activity is the routine repair and replacement of guardrails and similar features. It can include straightening and minor excavation.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O3 Minimize vegetation removal
- O5 Protect public safety and health
- O7 Maintain or restore the intended infrastructure function
- O10 Meet public expectations for aesthetics

Practices

Prevent disturbed soil from entering storm sewer or surface water bodies.

Minimize the area of soil disturbance.

If soil is disturbed, use sediment trapping and cover BMPs. Seed disturbed soils if the area will sustain vegetation.

Prevent pollutants such as paint and debris from entering storm sewer or surface water bodies.

If power washing, avoid discharging water and debris directly to storm sewers or surface water by trapping with gravel-filled bags and blocking inlets. If sand blasting, contain and sweep up residues and dispose of them following standard procedures.

Carry a spill response kit.

SPILL AND HAZARDOUS MATERIALS RESPONSE

Spill or hazardous materials response applies to any activity. It includes finding abandoned containers on City right-of-way or drainage structures; spills to roads, ditches or storm structures; and clean up and vehicle accidents.

The following procedures are subject to change as training, equipment, and staff changes occur.

SPILL/INCIDENT RESPONSE WHILE IN THE OFFICE OR WHILE IN THE FIELD

Purpose/Intent: This policy ensures that all Public Works employees understand notification procedures for calls or field discovery of chemicals spills (specifically, chemical spills into the City stormwater sewer system, as well as into surface and groundwater), abandoned chemical containers or garbage or trash.

Individual divisions and sections that have field staff that investigate, collect, or clean up materials must have proper training and procedures in place.

This policy applies to all Public Works employees. All employees are responsible to ensure compliance with this policy.

Policy Provisions

1.0 Spills and Leaking Containers

When an employee receives call or discovers a chemical spill into the City Stormwater System (roadside ditches, retention/detention ponds, drywells, and catch basins), and/or into surface water or groundwater (e.g., via drywell, etc.), the employee shall immediately take the following information from the caller:

a. Caller's name, telephone number, address, and where they can be reached later that day;
b. The address of the spill;
c. The physical location of the spill (e.g., northeast side of intersection…; near mile marker…; north on highway near…creek, etc.); and
d. License plates numbers, names of individuals, company names/logos on vehicles, if available.

Notification and Tracking Procedure

1. Call 911 (Emergency Services) and report the call and information
2. Call the Washington Department of Ecology Spill Response at 360-407-6300
3. Notify Public Works at 509-246-1823 that a call has been report to 911 and to the Washington Department of Ecology Spill Response

2.0 Abandoned Non-leaking Chemical Containers

Calls about contained material such as paint cans or barrels, calls should go to:

1. Public Works at 509-246-1823. Operations will evaluate the situation and complete the notification and reporting procedure.

3.0 Trash and Garbage

Calls about garbage and trash should go to:

1. Public Works at 509-246-1823. Operations will evaluate the situation and complete the notification and reporting procedure.

ACTIVITY: ACCIDENT CLEANUP

This activity involves cleanup of debris and spilled automotive fluids at accident scenes. Larger spills are discussed in the Spill Response Activity.

Outcomes

O1 Minimize sediment and pollutant discharges from the work area
O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
O5 Protect public safety and health
O7 Maintain or restore the intended infrastructure function

Practices

Follow City procedures for spill cleanup. Each maintenance vehicle has spill response instructions. Contact Public Works for more information.

ACTIVITY: SPILL RESPONSE (ILLICIT DUMPING OR CHEMICAL SPILL)
This is in response to a spill on a City-owned road or a spill impacting a storm sewer owned or operated by the City.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O5 Protect public safety and health
- O6 Prevent catastrophic infrastructure failures
- O7 Maintain or restore the intended infrastructure function

Practices

Follow practices defined in the spill reporting or response plan and policies. Each maintenance vehicle has spill response instructions. Contact Public Works for more information.

ACTIVITY: ABANDONED CONTAINER RESPONSE

This is response to discovery of abandoned waste containers on roads or other facilities owned or operated by the City.

Outcomes

- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O5 Protect public safety and health

Practices

Follow practices defined in the abandoned materials policy. Each maintenance vehicle has instructions on responding to abandoned containers. Contact Public Works for more information.

VEGETATION MANAGEMENT GOALS, VEGETATION MANAGEMENT AREAS, AND GENERAL BMPS

Vegetation management activities listed here are performed by grounds maintenance crews who care for parks, natural areas and landscaped areas. Roadside vegetation management is covered in an earlier section, Road Operation and Maintenance.

The last section of this appendix, Description of Vegetation and Pest Management Practices provides specific practices for each vegetation management activity in this section.

Vegetation management practices are adapted, with minor modifications for format and local practices, from City of Portland Parks Pest Management Policy (April 1999).

GENERAL GOALS AND PHILOSOPHY

The City recognizes the special importance of the rivers, streams, wetlands, ponds, and stormwater treatment facilities that fall under our stewardship. The sensitive nature of such habitats, their plant and animal communities, and their direct link with other waterways require that we establish specific policies to ensure their health. These sets of practices for vegetation management, pesticide use and fertilizer use establish guidelines and limitations regarding maintenance for waterways and adjacent lands.

All landscape management decisions for controlling unwanted vegetation, diseases, and pests will follow Integrated Pest Management (IPM) principles and decision-making rationale. These are

- Proper planning and management decisions begin the IPM process.
- Cultural methods of vegetation and pest control are preferred and are first employed.
- Mechanical means of vegetation and pest control are next in line of preference, and are utilized where feasible.
- Biological methods of vegetation and pest control are considered before chemical means, where they are feasible.
- Botanical and synthetic pesticides are used only when no other feasible methods exist.

MAIN CATEGORIES OF VEGETATION MANAGEMENT AREAS

Vegetation management practices vary for areas having different management objectives. The standards here apply to all areas, but more strict controls are placed on areas where code or policy dictate that native vegetation be preserved and in areas near water bodies. These are identified for each activity. There are special management areas for pesticide and fertilizer use in 25 foot setbacks from water bodies and in stormwater control facilities. Special clearing requirements may apply in areas defined by the City's Code.

All Areas

Practices for vegetation management apply as minimum standards for all areas. More restrictive standards and practices for protected habitat and water body setbacks are listed in each activity.

Habitat Conservation Areas

Few wetlands or wetlands buffers are mapped because very few wetlands are accurately mapped. Consult wetland maps or check with technical staff regarding the potential area and buffers for a wetland. Separate practices are established for vegetation management and pest control near water bodies and inside City Habitat Conservation Areas which include protections for existing trees and shrubs and special setbacks from water bodies for controls on pesticide and fertilizer use. Vegetation management practice for specific activities or types of area such as intensively managed parks or natural areas are listed under Vegetation Management Activities.

DESCRIPTIONS AND EXAMPLES OF TYPES OF VEGETATION MANAGEMENT AREAS AND ACTIVITIES

Landscape management activities are grouped by the condition and use of the area. These can include areas inside Habitat Conservation Areas, areas in water body setbacks for pesticide and fertilizer use, and areas remote from Habitat Conservation Areas (HCA) or water bodies.

Park landscapes near waterways, lakes and ponds are divided into four classifications, ranging from intensively managed high-use areas to intact natural areas. The classifications describe their current features, as well as define the differing objectives and maintenance rationales of their care. Along with these landscapes, there are activities for maintaining storm sewer facilities and constructed wetlands.

Features and Objectives in Highly-Managed Areas.

These are areas where there is exceptionally high traffic and can include areas where there are special standards for vegetation maintenance.

Features of Highly Managed Areas

- Ornamental landscape
- Public access and activity
- High public use
- Mowing of turf, sometimes to edge of waterway
- May have facilities adjacent to water
- May have highly modified stream banks
- Often limited plantings in water body buffers

Objectives for Highly Managed Areas

- Healthy plants and turf
- Maintain ability to handle high use
- May have high expectation for aesthetics in general
- Minimize need for chemical intervention
- Control invasive plants
- Safe access
- No bare soil areas
- Low tolerance for weeds

Features and Objectives in Less-Managed Areas

Less-managed areas can include a wide variety of areas where there is a lower level of vegetation management due to public access or the area is within a water body buffer. General examples are road shoulders, less used or natural areas in developed parks, and unused land where seasonal or less frequent vegetation management occurs.

Features of Less Managed Areas

- There is a mix of native and non-native plants
- Water bodies have adjacent areas of predominantly native plants
- Some impacts from use and park development apparent in water body buffers
- Managed landscapes may be nearby
- Stream bank erosion may be occurring due to use

Objectives for Less Managed Areas

- Maintain healthy plants in HCAs or water body buffers
- Minimize need for chemical intervention
- Control invasive plants where feasible
- Minimize impact on water body buffers
- No bare soil areas

- Tolerance for natural appearance and weeds

Features and Objectives in Impacted Natural Areas

Impacted natural areas are generally in parks and undeveloped land. These areas may or may not be in Habitat Conservation Areas or water body setbacks.

Features of Impacted Areas

- Very limited impact to native vegetation
- Stream banks are buffered with predominately native plants
- There are observable limited impacts from use and park development
- Managed landscapes are not nearby

Objectives for Impacted Areas

- Maintain healthy plant community
- Minimize need for chemical intervention
- Lower tolerance of invasive plants, non- natives
- Minimize any impacts on buffer
- No bare soil areas are allowed

Features and Objectives in Intact Natural Areas

Intact natural areas are rare and exceptional places where there is intact and self-sustaining native vegetation.

Features of Intact Natural Areas

- Very limited visitor impact
- Native plant communities exist
- No nearby developed park areas

Objectives for Intact Natural Areas

- Maintain healthy plant community
- No tolerance of invasive plants, non-natives
- Minimize any impacts from activities

Features and Objectives in Stormwater Facilities

Stormwater facilities are constructed features that control or treat stormwater. The most common types of facility are swales, ponds and treatment wetlands. Many include vegetation for treatment, habitat or aesthetics. Specific maintenance requirements are included in activities for storm sewer maintenance.

Features of Stormwater Facilities

- There is a mix of native and non-native plants
- Generally not used by the public
- Include areas managed to promote design function, such as turf in swales
- Managed landscapes may be nearby

Objectives for Intermediate Areas

- Maintain healthy plant communities
- Minimize need for chemical intervention
- Control invasive plants where feasible
- No bare soil areas are allowed
- Tolerance for natural appearance and weeds

Features and Objectives in Constructed Wetlands

Constructed wetlands refer to wetlands built to replace lost wetlands or as a habitat feature. They are not stormwater facilities and are considered natural surface water bodies. Constructed wetlands have specific plans for establishing and maintaining vegetation which should be consulted and followed in addition to the requirements in this manual.

Features of Constructed Wetlands

- Limited public access
- Plants may or may not be well established depending on age and condition

Objectives for Constructed Wetlands

- Maintain healthy plant communities
- Minimize need for chemical intervention
- Low tolerance of invasive plants, non- natives
- Bare soil areas are not allowed

MULCHING

Mulches and other ground coverings are useful during the installation and restoration of landscapes as well as their ongoing maintenance. Mulches meet a variety of needs. They suppress weeds, help to retain moisture around plants, reduce possible erosion, and provide visual enhancement.

Always consider the possible impacts when using mulches, which may include:

- Inadvertent introduction of non-native weeds and diseases to the site.
- Leaching of substances such as tannins from the mulch into nearby waterways.
- Migration of mulch material into waterways.
- Nutrient leaching into waterways.

The most serious problems are probably introduction of weeds and diseases. Routine maintenance in waterway buffers should minimize the use of mulches. Mulching is best used as a part of restoration activity. Mulching in areas that are below typical high water lines is discouraged in any buffer areas.

It is permissible to plant cover crops to control erosion in buffer zones. Cover crops should never introduce any persistent non-native plant species.

MINIMIZE PESTICIDE DRIFT

Managing drift is of particular importance when surface waters are nearby. Application equipment used in the application shall employ all necessary methods to limit drift. Nozzle size, pressure regulation, droplet size, and height of spray wand, are all techniques that can be modified to reduce unwanted drift of pesticides.

Spray applications are not to be allowed in a water body set back area when:

- Wind speed is above 8 mph.
- Wind direction or activity would carry pesticides toward, or deposit them upon open water.

USE ACCEPTABLE PESTICIDES

To minimize possible aquatic impacts, only a limited group of pesticides are allowed in buffer areas. Only the pesticides specifically listed in the following tables may be used as specified in each activity. Generally, restrictions fall into two groups: general use outside of water body setbacks and within 25-foot water body setbacks. This selection of pesticides considers any possible effects on aquatic life as well as pesticide tendencies to move in the environment.

This list of pesticides may be revised to include or drop compounds. Reasons for changes include the potential for plants to become tolerant or build resistance to specific compounds, addition of a new compound to state approved pesticides, or federal or state removal of a pesticide.

Materials Allowed in Buffer Areas in Certain Circumstances (See Individual Activities)

Post emergent herbicides:
Triclopyr products: Garlon 3A (or other amine formulations only, not Garlon 4)
Surfactant (i.e. R-11)

Pre-emergent herbicides:
Oryzalin (Surflan)
Napropamide (Devrinol)

Materials Allowed in for Use in Aquatic Habitats under Certain Circumstances

Aquatic labeled only:
Approved surfactant (R-11 or equivalent)
Aquashade (acid blue 9, acid yellow 23)

The following matrix gives specific guidelines for pesticide and fertilizer use in 25-foot water-body setbacks that have varying levels of management. Pesticide and fertilizer use also depends on whether the activity is routine maintenance or restoration and construction projects.

See the requirements for each maintenance activity in for specifics in each area.

Use of Pesticides and Fertilizers Within 25-Foot Water Body Set Backs

Chemical used	MAINTENANCE ACTIVITY	**Intensively Managed Areas**	**Less Intensively Managed Areas/Stormwater Facilities**	**Impacted areas and Constructed Wetlands**	**Intact Natural Areas**
Pre-emergent herbicide use possible?	Routine Maintenance	Only in shrub beds above high water line	Not Allowed	Not Allowed	Not Allowed
	During Construction or Restoration	Only in shrub beds above high water line	Not Allowed	Not Allowed	Not Allowed
Triclopyr use possible?	Routine Maintenance	Cut and treat stems. Spot spray	Cut and treat stems. *Spot spray to establish monocots**	Cut and treat stems. Spot spray	Not Allowed
	During Construction or Restoration	Cut and treat stems. *Broadcast spray**	Cut and treat stems. *Spot spray/broadcast to establish monocots**	Cut and treat stems. *Broadcast spray**	Not Allowed
Fertilizer Used:					
Slow release fertilizer use possible?	Routine Maintenance	Directed applications to shrub beds if no flooding possible	Not Allowed	Not Allowed	Not Allowed
	During Construction or Restoration	Directed applications if no flooding possible	Directed applications if no flooding possible	Directed applications if no flooding possible	Directed applications if no flooding possible

** Requires approval of Manager, or Wetland Ecologist*

Materials Available for Tree Injections

If a pest or disease threatens the health of *important and valuable trees* within a Habitat Conservation Area or 25-foot water body set back, there may be a need to treat them. Instances of this occurring are rare however. The intent and limit of this exception to the approved buffer area pesticide list is to allow only the insecticides or fungicides necessary to combat direct threats to the health of valuable trees. In these special cases, the use of injected pesticides may be employed, with the following limitations:

- The pesticide applied must be delivered by methods that inject or otherwise distribute the material entirely within interior tree tissues.

- Pesticides will not be injected into the soil surrounding the tree. Tree surfaces will not be sprayed or treated with pesticides, with the exception of approved fungicides and biological agents.

Following These BMPs in All Other Areas

Water body setbacks have the most restrictive controls on pesticide and fertilizer use. Generally, the standards for outside setbacks are quite similar. See each individual vegetation management activity for specific requirements.

KEEP GOOD RECORDS OF PESTICIDE USE (RECORD KEEPING REQUIREMENTS)

Regular application record keeping requirements are required for all pesticide applications. Records shall include:

- Applicator name and license number;
- Date and the time intervals of the application;
- Location of application;
- Temperature and wind conditions;
- Materials and concentrations used; and
- Amount applied, coverage rate, and equipment used.

HAVE A STATE APPLICATORS' LICENSES

All personnel who apply pesticides to City lands must be Washington Department of Agriculture licensed applicators or have a license recognized by the Washington Department of Agriculture. Only licensed personnel who have received an additional aquatics license certification may apply pesticides to aquatic sites.

VEGETATION MANAGEMENT ACTIVITIES

This section describes specific vegetation management activities and the best management practices to follow.

ACTIVITY: MAINTAINING SHRUB BEDS IN HIGHLY MANAGED AREAS

This activity is caring for shrubs and plants in high-use areas such as day use parks, road medians, landscaped areas along roads, and public building landscapes. Due to their use as public areas and surroundings to public buildings, there is a low tolerance for weeds in these areas. Maintenance includes pruning, plant replacement, flower planting, plant removal, weeding and bark dust or mulch placement, litter removal, edging and irrigation system operation.

Outcomes

O1	Minimize sediment and pollutant discharges from the work area
O2	Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
O3	Minimize vegetation removal
O4	Preserve native plants
O5	Protect public safety and health
O7	Maintain or restore the intended infrastructure function
O10	Meet public expectations for aesthetics

Practices

The main goal in maintaining these areas is sustaining the appearance of the planting bed. This is largely through weed control, pruning, and mulching.

Vegetation is trimmed to keep clear “sight distances” and to keep signs visible. Trees and shrubbery are trimmed to allow street sweepers clear access to curbs.

Do not remove native shrubs or trees within stream buffers, wetland buffers, or along drainage ditches that have base flow. Consult with the area supervisor before removing trees or brush within 250 feet of a stream.

When applying bark dust or mulch, make sure that it is placed in a manner that prevents it from washing into storm sewers, ditches or streams. Bare spots are minimized by the use of mulch or appropriate cover plants to prevent erosion. Cover bare soils with an erosion prevention cover BMP. Vegetate bare soils.

Minimize the use of mulches within 25 feet of a waterbody.

Hand remove weeds such as black berry vines, nightshade, scotch broom, English ivy, and holly, while keeping other bushes and trees. Chemical intervention is minimized.

Follow BMPs for pesticide and fertilizer application, storage, disposal and record keeping as outlined in the previous section.

Follow chemical use listed in the attached table. This list of pesticides and fertilizers may be revised to include or drop compounds. Reasons for changes include the potential for plants to become tolerant or build resistance to specific compounds, addition of a new compound to state approved pesticides, or federal or state removal of a pesticide.

Use of Pesticides and Fertilizers in for Shrub Beds in Highly-Managed Areas

Chemical Used	**Maintenance Activity**	**Allowed Uses**
Pre-emergent herbicide use possible?	Routine Maintenance	Only in shrub beds above high water line
	During Construction or Restoration	Only in shrub beds above high water line
Triclopyr use possible?	Routine Maintenance	Cut and treat stems. Spot spray
	During Construction or Restoration	Cut and treat stems. *Broadcast spray**
Fertilizer Used:	**Maintenance Activity**	**Allowed Uses**
Slow release fertilizer use possible?	Routine Maintenance	Directed applications to shrub beds if no flooding possible
	During Construction or Restoration	Directed applications if no flooding possible

** Requires approval of Public Works Supervisor or Wetland Ecologist*

ACTIVITY: LANDSCAPED TURF MAINTENANCE (HIGHLY-MANAGED AREAS)

This activity is caring for turf in landscaped areas such as parks, road medians, and around buildings. It includes mowing, fertilizing, herbicide use, sweeping, raking, top dressing, aerating, edging, debris removal, and irrigation.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O3 Minimize vegetation removal
- O5 Protect public safety and health
- O7 Maintain or restore the intended infrastructure function
- O10 Meet public expectations for aesthetics

Practices

The main goal in maintaining these areas is maintaining appearance and vigorous turf growth for high-traffic areas. This includes having healthy turf and plants, minimizing weeds and bare spots, and providing safe access to the water.

Bare spots are minimized by seeding turf.

Mower clippings are left on the ground unless they are so thick that they cover the turf. Minimize the use of mulches within 25 feet of a water body.

Chemical intervention is minimized. This includes spot spraying for weeds and minimizing insecticides and fungicides. Fertilizer use is limited to that needed to sustain intended use.

Follow chemical use listed in the attached table. Outside of the 25-foot water body set back, fertilizers are applied to sustain turf growth. Lime is applied once per year. This list of pesticides and fertilizers may be revised to include or drop compounds. Reasons for changes include the potential for plants to become tolerant or build resistance to specific compounds, addition of a new compound to state approved pesticides, or federal or state removal of a pesticide.

Follow BMPs for pesticide and fertilizer application, storage, disposal and record keeping as outlined in the previous section: Vegetation Management Goals.

Where feasible, turf areas will be fitted with computerized irrigation systems to better maintain turf during the summer. Better irrigation will allow more frequent mowing and better control irrigation runoff.

Turf Management in Near Lakes and Ponds

In areas where intensively maintained turf extends to the edge of a water body, special management measures are used as much as feasible considering the management objectives. Special measures include more frequent, low rate fertilizer application or temperature release fertilizer and computerized irrigation systems that prevent over watering and fertilizer runoff.

Use of Pesticides and Fertilizers for Turf Management (Highly Managed Areas)

Chemical Used	**Maintenance Activity**	**Allowed Uses**
Pre-emergent herbicide use possible?	Routine Maintenance	Only in shrub beds above high water line
	During Construction or Restoration	Only in shrub beds above high water line
Triclopyr use possible?	Routine Maintenance	Cut and treat stems. Spot spray
	During Construction or Restoration	Cut and treat stems. *Broadcast spray**
Fertilizer Used:	**Maintenance Activity**	**Allowed Uses**
Slow release fertilizer use possible?	Routine Maintenance	Directed applications to if no flooding possible
	During Construction or Restoration	Directed applications if no flooding possible

** Requires approval of Public Works Supervisor or Wetland Ecologist*

ACTIVITY: MAINTAINING ROADSIDES AND LOWER USE AREAS OF PARKS

This activity is lower intensity management of plants along roads and lower use areas of parks, or other low use landscapes. There is a higher tolerance for weeds in these areas than in day-use parks and landscaped areas around public buildings.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O3 Minimize vegetation removal
- O4 Preserve native plants
- O5 Protect public safety and health
- O7 Maintain or restore the intended infrastructure function
- O10 Meet public expectations for aesthetics

Practices

The main goal in maintaining these areas is maintaining appearance with a minimum amount of work and chemical intervention. This largely includes controlling weeds.

Consider hardiness and drought tolerance when selecting plants.

Do not remove native shrubs or trees within stream buffers, wetland buffers, or along drainage ditches that have base flow. Consult with the area supervisor before removing trees or brush within 250 feet of a stream.

If there is a water body or ditch with water flow during dry weather, only remove desirable shrubs or bushes when sight distance is an issue, and after checking with the area supervisor.

When applying mulches or bark dust, make sure that it will not wash off into storm sewer, ditches or streams. Bare spots are minimized by the use of mulch or appropriate cover plants to prevent erosion. Cover bare soils with an erosion prevention cover BMP. Vegetate bare soils.

Hand remove weeds such as black berry vines, nightshade, scotch broom, English ivy, and holly, while keeping other bushes and trees. Chemical intervention is minimized.

The attached list of pesticides and fertilizers may be revised to include or drop compounds. Reasons for changes include the potential for plants to become tolerant or build resistance to specific compounds, addition of a new compound to state approved pesticides, or federal or state removal of a pesticide.

Use of Pesticides and Fertilizers in Lower Use Areas and Roadside Plantings

Chemical Used	**Maintenance Activity**	**Allowed Uses**
Pre-emergent herbicide use possible?	Routine Maintenance	Only in shrub beds above high water line
	During Construction or Restoration	Only in shrub beds above high water line
Triclopyr use possible?	Routine Maintenance	Cut and treat stems. Spot spray
	During Construction or Restoration	Cut and treat stems. *Broadcast spray**
Fertilizer Used:	**Maintenance Activity**	**Allowed Uses**
Slow release fertilizer use possible?	Routine Maintenance	Directed applications to shrub beds if no flooding possible
	During Construction or Restoration	Directed applications if no flooding possible

** Requires approval of Public Works Supervisor or Wetland Ecologist*

ACTIVITY: VEGETATION AND PEST MANAGEMENT IN LESS-MANAGED AREAS

These are areas in parks or other lands that are less actively managed than turf or shrub beds. These areas may include degraded or modified natural areas or unused land that is maintained periodically or seasonally. In Habitat Conservation Areas, these land areas are maintained for the purpose of establishing natural vegetation. There is a tolerance for natural appearance and weeds. There may be some use such as water access by the public, but that is not the primary use of the area.

Outcomes

- O1 Minimize sediment and pollutant discharges from the work area
- O2 Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
- O3 Minimize vegetation removal
- O4 Preserve native plants
- O7 Maintain or restore the intended infrastructure function

Practices

Practices in these less-managed areas focus on establishing and maintaining healthy native plantings. This includes controlling invasive plants where feasible, minimizing the human impact on the buffer, and planting cover on bare soils.

Follow BMPs for pesticide and fertilizer application, storage, disposal and record keeping as outlined in the following section.

Within natural areas, limit the use of mulches to covering bare soils while establishing plantings.

Pesticide and fertilizer should be avoided within 25 feet of a water body.

The attached list of pesticides and fertilizers may be revised to include or drop compounds. Reasons for changes include the potential for plants to become tolerant or build resistance to specific compounds, addition of a new compound to state approved pesticides, or federal or state removal of a pesticide.

Use of Pesticides and Fertilizers in Less-Managed Areas

Chemical Used	**Maintenance Activity**	**Allowed Uses**
Pre-emergent herbicide use possible?	Routine Maintenance	Not Allowed
	During Construction or Restoration	Not Allowed
Triclopyr use possible?	Routine Maintenance	Cut and treat stems. Spot spray
	During Construction or Restoration	Cut and treat stems. *Broadcast spray**
Fertilizer Used:	**Maintenance Activity**	**Allowed Uses**
Slow release fertilizer use possible?	Routine Maintenance	Not Allowed
	During Construction or Restoration	Directed applications if no flooding possible

** Requires approval of Public Works Supervisor or Wetland Ecologist*

ACTIVITY: VEGETATION AND PEST MANAGEMENT IN IMPACTED NATURAL AREAS

Impacted natural areas are predominately native plants and limited influence from public use and park development. The main objective is to maintain and improve the healthy plant community. Impacted areas have a lower tolerance for invasive or non-native plants.

Outcomes

O4 Preserve native plants
O7 Maintain or restore the intended infrastructure function

Practices

Practices in these areas focus on establishing and maintaining healthy native plantings. This includes more vigorously controlling invasive plants and the human impact on the buffer. It also includes covering for bare soils with native plants.

Limit mulch use to covering bare soil while establishing plantings.

Pesticide and fertilizer use is minimized and is avoided if possible within 25 feet of a water body.

Follow BMPs for pesticide and fertilizer application, storage, disposal and record keeping as outlined in the previous section: Vegetation Management Goals. The attached list of pesticides and fertilizers may be revised to include or drop compounds. Reasons for changes include the potential for plants to become tolerant or build resistance to specific compounds, addition of a new compound to state approved pesticides, or federal or state removal of a pesticide.

Use of Pesticides and Fertilizers in Impacted Natural Areas

Chemical Used	**Maintenance Activity**	**Allowed Uses**
Pre-emergent herbicide use possible?	Routine Maintenance	Not Allowed
	During Construction or Restoration	Not Allowed
Triclopyr use possible?	Routine Maintenance	Cut and treat stems. *Spot spray to establish monocots**
	During Construction or Restoration	Cut and treat stems. *Spot spray/broadcast to establish monocots**
Fertilizer Used:	**Maintenance Activity**	**Allowed Uses**
Slow release fertilizer use possible?	Routine Maintenance	Not Allowed
	During Construction or Restoration	Directed applications if no flooding possible

**Requires approval of Public Works Supervisor or Wetland Ecologist*

ACTIVITY: VEGETATION AND PEST MANAGEMENT IN INTACT NATURAL AREAS

Intact natural areas are separate from developed parks and have very limited public access. They have established native plant communities. The objective is to maintain the healthy plant buffer and provide wildlife habitat. There is no tolerance for invasive or non-native plants. There is little public access to these areas other than trails.

Outcomes

O4 Preserve native plants
O7 Maintain or restore the intended infrastructure function

Practices

Practices in these areas focus on maintaining healthy native plantings. This includes vigorously controlling invasive plants and human impact on the buffer.

Avoid the use of mulches.

Pesticide and fertilizer use is minimized or not allowed.

Follow BMPs for pesticide and fertilizer application, storage, disposal and record keeping as outlined in the previous section: Vegetation Management Goals. The attached list of pesticides and fertilizers may be revised to include or drop compounds. Reasons for changes include the potential for plants to become tolerant or build resistance to specific compounds, addition of a new compound to state approved pesticides, or federal or state removal of a pesticide.

Use of Pesticides and Fertilizers in Intact Natural Areas of Habitat Buffers

Chemical Used	**Maintenance Activity**	**Allowed Uses**
Pre-emergent herbicide use possible?	Routine Maintenance	Not Allowed
	During Construction or Restoration	Not Allowed
Triclopyr use possible?	Routine Maintenance	Cut and treat stems. *Spot spray to establish monocots**
	During Construction or Restoration	Cut and treat stems. *Spot spray/broadcast to establish monocots**
Fertilizer Used:	**Maintenance Activity**	**Allowed Uses**
Slow release fertilizer use possible?	Routine Maintenance	Not Allowed
	During Construction or Restoration	Directed applications if no flooding possible

** Requires approval of Public Works Supervisor*

ACTIVITY: VEGETATION AND PEST MANAGEMENT IN STORMWATER CONTROL FACILITIES

Stormwater control facilities include biofiltration treatment swales, treatment wetlands, treatment ponds, detention ponds, open channels, and infiltration basins. Stormwater control facilities discharge to surface water or groundwater either directly or through pipes or ditches. Many facilities are built to remove pollutants from stormwater.

Generally, vegetation should be maintained to blend into surrounding areas. Stormwater facilities can provide habitat for aquatic life and birds. Promoting natural vegetation where feasible improves habitat. Swales often blend into intensively managed landscapes. Pond perimeters can include natural vegetation.

The use of pesticides and, in most cases fertilizer, is not compatible with the task of pollutant removal or the direct connection of stormwater facilities to streams and groundwater.

Features of Stormwater Facilities

- There is a mix of native and non-native plants
- Generally not used by the public
- Include areas managed to promote design function, such as turf in swales
- Managed landscapes may be nearby
- May be used by fish and wildlife

Objectives for Stormwater Facilities

- Maintain healthy plant communities
- Avoid or minimize need for chemical intervention
- Control invasive plants where feasible
- No bare soil areas are allowed
- Tolerance for natural appearance and weeds

Outcomes

O1	Minimize sediment and pollutant discharges from the work area
O2	Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
O3	Minimize vegetation removal
O4	Preserve native plants
O7	Maintain or restore the intended infrastructure function
O8	Prevent or reduce flooding
O10	Meet public expectations for aesthetics

Practices

Pest management practices in stormwater facilities mirror the less-managed park areas. The focus is establishing and maintaining healthy, low-maintenance native or landscape plantings and sustaining the design function of vegetated filters such as biofiltration swales. This includes controlling invasive plants where feasible, minimizing the human impact on the buffer, and planting cover on bare soils.

In some cases, the original plantings may not be appropriate for the actual condition at a facility. One example is a frequently flooded swale that cannot support normal turf. In cases like this, replace turf with appropriate plants if the underlying drainage problem cannot be fixed.

Consider the use of soil amendments such as compost before using fertilizer.

Limit mulch use to covering bare soil while establishing plantings.

Follow BMPs for pesticide and fertilizer application, storage, disposal and record keeping as outlined in the previous section: Vegetation Management Goals. The attached list of pesticides and fertilizers may be revised to include or drop compounds. Reasons for changes include the potential for plants to become tolerant or build resistance to specific compounds, addition of a new compound to state approved pesticides, or federal or state removal of a pesticide.

Chemical use should be avoided within 25 feet of any area that holds or conveys surface water or stormwater. This includes the base of a biofiltration swale.

Stormwater treatment and control facilities, including wetlands, intercept storm water run-off before it enters surface water or groundwater. There are no provisions for herbicide use below the high water line of these facilities.

Trees or shrubs that block access roads may be trimmed (or removed if within the access road) at the time of when access is required for maintenance by heavy equipment.

Trees that pose a risk to stormwater structures due to root growth may be removed and replaced by smaller shrubs.

Use of Pesticides and Fertilizers in Stormwater Facilities

Chemical Used	**Maintenance Activity**	**Allowed Uses**
Pre-emergent herbicide use possible?	Routine Maintenance	Not Allowed
	During Construction or Restoration	Not Allowed
Triclopyr use possible?	Routine Maintenance	Cut and treat stems. Spot spray
	During Construction or Restoration	Cut and treat stems. *Broadcast spray**
Fertilizer Used:	**Maintenance Activity**	**Allowed Uses**
Slow release fertilizer use possible?	Routine Maintenance	Not Allowed
	During Construction or Restoration	Directed applications if no flooding possible

** Requires approval of Public Works Supervisor or Wetland Ecologist*

ACTIVITY: VEGETATION AND PEST MANAGEMENT IN CONSTRUCTED WETLAND AREAS

The City may build wetlands to mitigate for wetlands lost during road construction or other public works. These are not stormwater facilities, but compensation for wetlands taken during construction projects. This activity applies only to parts of wetlands that are not subject to inundation during the growing season. Public Works crews use no chemical controls in wetland water bodies.

Noxious weed controls may include herbicide use in wetlands.

Constructed wetlands progress from little or no natural vegetation to an ideal state where they are self-sustaining natural areas. As water bodies, wetlands connect to streams and groundwater. Wetlands also host insects, fish, amphibians, and birds that are sensitive to horticultural chemicals. Because of this, chemical use should be minimized in wetland buffers. Wetland management has a low tolerance for invasive or non-native plants.

Outcomes

O1	Minimize sediment and pollutant discharges from the work area
O2	Prevent City roads, drainage systems, facilities and property from becoming pollutant sources
O3	Minimize vegetation removal
O4	Preserve native plants
O7	Maintain or restore the intended infrastructure function

Practices

Practices in these areas focus on establishing and maintaining healthy native plantings. This includes more vigorously controlling invasive plants and the human impact on the buffer. It also includes covering for bare soils.

Consider the use of soil amendments such as compost before using fertilizer.

Limit mulch use to covering bare soil while establishing plantings.

Chemical intervention is minimized and is avoided if possible within 25 feet of a water body.

Follow BMPs for pesticide and fertilizer application, storage, disposal and record keeping as outlined in the previous section: Vegetation Management Goals. The attached list of pesticides and fertilizers may be revised to include or drop compounds. Reasons for changes include the potential for plants to become tolerant or build resistance to specific compounds, addition of a new compound to state approved pesticides, or federal or state removal of a pesticide.

Use of Pesticides and Fertilizers in Constructed Wetlands

Chemical Used	**Maintenance Activity**	**Allowed Uses**
Pre-emergent herbicide use possible?	Routine Maintenance	Not Allowed
	During Construction or Restoration	Not Allowed
Triclopyr use possible?	Routine Maintenance	Cut and treat stems. *Spot spray to establish monocots**
	During Construction or Restoration	Cut and treat stems. *Spot spray/broadcast to establish monocots**
Fertilizer Used:	**Maintenance Activity**	**Allowed Uses**
Slow release fertilizer use possible?	Routine Maintenance	Not Allowed
	During Construction or Restoration	Directed applications if no flooding possible

** Requires approval of Public Works Supervisor or Wetland Ecologist*

ACTIVITY: WEED CONTROL WITHIN WATER BODIES

Specific practices are allowed in water bodies such as streams, ponds and wetlands. Chemical controls are allowed only in extreme cases where there is a threat of near complete habitat loss due to an invasive weed.

Weed control within natural water bodies requires an authorization under the State Hydraulic Code. Activities such as dredging require approval from the Washington Department of Fish and Wildlife. Mechanical harvesting is allowed without consultation with Washington Department of Fish and Wildlife if practices in their publication *#APD-1-98, Aquatic Plants and Fish* are followed.

Within Streams

In the rare need for control of noxious weeds and invasive non-native plants within a stream itself, mechanical and biological means will be utilized.

Within Pond and Lake Areas

Weed control is by mechanical removal. There are special requirements for disposal of aquatic weeds to prevent spreading seeds. The Public Works Supervisor will determine the proper disposal methods.

Biological controls are used in some situations.

If an emergency situation arises where habitat is endangered by non-native invasive submerged weeds in ponds and lakes, the Manager may approve the use of an aquatic use approved herbicide for control as a last resort.

Herbicide use is only allowed where there is no direct outflow of the treated water to streams or waterways. The herbicide utilized shall be of very low toxicity to aquatic organisms, and be applied in such a way that there are no appreciable negative effects on the health of the aquatic environment.

Within Wetlands Areas

There are no provisions for the use of herbicides in open water areas in wetlands or constructed wetlands. Aquatic use approved herbicides may be used during establishment of constructed wetlands. The City may control noxious weeds in some cases.

Within Stormwater Ponds, Swale Treatment Areas and Treatment Wetlands

Stormwater treatment and control facilities, including wetlands, intercept storm water run-off before it enters surface water or groundwater. There are no provisions for herbicide use below the high water line of these facilities. The City may control noxious weeds in some cases.

TRAINING

Training is an essential component to successful water quality BMP use. Simple diagrams and descriptions will not be adequate to demonstrate the use of many BMPs in the field. Training should include field demonstrations, videos, slide shows, and reference cards or field manuals.

INITIATION TRAINING

Training for new employees should include the basic dos and don’ts. Why things like dirt are a pollutant that we control during routine operations. What is absolutely not allowed, such as dumping excavated material into streams, washing debris into storm drains and streams, and so forth.

This training should set the base for added training about implementing BMPs.

BMP TRAINING

Staff should be provided with basic manuals that include diagrams and descriptions of the practices to meet standards for water quality.

Crew chiefs and employees under their supervision should have training in BMP use for the activities they perform. Specific training, classroom and field, in the use of the BMP should lead to more successful implementation than simply providing a written manual.

MAP/TRACK PROBLEM AREAS

Problem areas where erosion, sediment accumulation in ditches or other water quality problems occur should be mapped so that they can be systematically tracked and solutions documented.

MAP HABITAT AREAS/STREAMS/WETLANDS

Create wall maps and atlases that show the extent and type of Habitat Conservation Areas, known wetlands, and streams that require special consideration under City code. The purpose of the maps is to raise awareness of the extent of these areas as well as simply show where they are.

APPENDIX B

COST ESTIMATES

CITY OF BRIDGEPORT
F1A: 10TH STREET CONVEYANCE PIPE
PLANNING LEVEL COST ESTIMATE
Replace damaged pipe with approximately 210 LF 18" stormwater pipe
May 2024
G&O# 23851

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	AMOUNT
1.	Minor Changes	1	LS	$ 10,000	$ 10,000
2.	Mobilization, Cleanup and Demobilization	1	LS	$ 9,000	$ 9,000
3.	SPCC Plan	1	LS	$ 1,000	$ 1,000
4.	Locate Existing Utilities	1	LS	$ 3,000	$ 3,000
5.	Survey	1	LS	$ 10,000	$ 10,000
6.	Project Temporary Traffic Control	1	LS	$ 8,000	$ 8,000
7.	Removal of Unsuitable Material (Trench)	30	CY	$ 25	$ 750
8.	Trench Excavation Safety Systems	1	LS	$ 1,000	$ 1,000
9.	Crushed Surfacing Top Course	18	TN	$ 45	$ 788
10.	Crushed Surfacing Base Course	40	TN	$ 45	$ 1,800
11.	Sawcutting	500	LF	$ 5	$ 2,500
12.	HMA CL 1/2" PG 58H-22	30	TN	$ 180	$ 5,400
13.	Temporary Storm Bypass Pumping	1	LS	$ 1,500	$ 1,500
14.	CPEP Storm Sewer Pipe, 18-inch Diam (Incl. Bedding)	210	LF	$ 90	$ 18,900
15.	Catch Basin Type 2, 48 In Diam.	1	EA	$ 8,000	$ 8,000
16.	Connection to Existing Storm System	1	EA	$ 1,500	$ 1,500
17.	Bank Run Gravel for Trench Backfill [(1)]	150	TN	$ 45	$ 6,750
18.	Erosion Control and Water Pollution Prevention	1	LS	$ 1,000	$ 1,000
19.	Seeding, Fertilizing and Mulching	10	SY	$ 10	$ 100
20.	Topsoil Type A	5	CY	$ 100	$ 500
21.	Project Documentation	1	LS	$ 1,000	$ 1,000
	Subtotal				$ 92,488
	Construction Contingencies (30%)				$ 27,746
	Subtotal				$ 120,234
	Sales Tax (7.8%)				$ 9,378
	Total Construction Cost				**$ 129,612**
	Design, Construction Administration Services and Permitting (30%)				$ 37,000
	Total Project Cost (rounded)				**$ 167,000**

(1) Trench backfill was assumed to be 100% import

Inflation Rate:	**3.0%**
Project Cost (2026):	**$ 178,000**

CITY OF BRIDGEPORT
F1B: 10TH STREET ADDITONAL UPSIZING
PLANNING LEVEL COST ESTIMATE
Upsize 775 LF of 18" pipe to 24" pipe
May 2024
G&O# 23851

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	AMOUNT
1.	Minor Changes	1	LS	$ 10,000	$ 10,000
2.	Mobilization, Cleanup and Demobilization	1	LS	$ 24,000	$ 24,000
3.	SPCC Plan	1	LS	$ 1,000	$ 1,000
4.	Locate Existing Utilities	1	LS	$ 3,000	$ 3,000
5.	Survey	1	LS	$ 10,000	$ 10,000
6.	Project Temporary Traffic Control	1	LS	$ 21,000	$ 21,000
7.	Removal of Unsuitable Material (Trench)	90	CY	$ 25	$ 2,250
8.	Excavation, Embankment and Grading, Incl. Haul	270	CY	$ 60	$ 16,200
8.	Trench Excavation Safety Systems	1	LS	$ 1,000	$ 1,000
9.	Crushed Surfacing Top Course	65	TN	$ 45	$ 2,906
10.	Crushed Surfacing Base Course	130	TN	$ 45	$ 5,850
11.	Sawcutting	1,600	LF	$ 5	$ 8,000
12.	HMA CL 1/2" PG 58H-22	80	TN	$ 180	$ 14,400
13.	Temporary Storm Bypass Pumping	1	LS	$ 4,000	$ 4,000
14.	CPEP Storm Sewer Pipe, 24-inch Diam (Incl. Bedding)	775	LF	$ 100	$ 77,500
15.	Catch Basin Type 2, 48 In Diam.	2	EA	$ 8,000	$ 16,000
16.	Connection to Existing Storm System	2	EA	$ 1,500	$ 3,000
17.	Bank Run Gravel for Trench Backfill (1)	530	TN	$ 45	$ 23,850
18.	Erosion Control and Water Pollution Prevention	1	LS	$ 1,000	$ 1,000
19.	Seeding, Fertilizing and Mulching	450	SY	$ 10	$ 4,500
20.	Topsoil Type A	115	CY	$ 100	$ 11,500
21.	Project Documentation	1	LS	$ 1,000	$ 1,000
	Subtotal				$ 261,956
	Construction Contingencies (30%)				$ 78,587
	Subtotal				$ 340,543
	Sales Tax (7.8%)				$ 26,562
	Total Construction Cost				**$ 367,105**
	Design, Construction Administration Services and Permitting (30%)				$ 103,000
	Total Project Cost (rounded)				**$ 471,000**

(1) Trench backfill was assumed to be 100% import

Inflation Rate:	**3.0%**
Project Cost (2028):	**$ 531,000**

CITY OF BRIDGEPORT
F2: 12TH STREET CONVEYANCE UPSIZING
PLANNING LEVEL COST ESTIMATE
Upsize 665 LF of 10" pipe to 12" pipe
May 2024
G&O# 23851

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	AMOUNT
1.	Minor Changes	1	LS	$ 10,000	$ 10,000
2.	Mobilization, Cleanup and Demobilization	1	LS	$ 17,000	$ 17,000
3.	SPCC Plan	1	LS	$ 1,000	$ 1,000
4.	Locate Existing Utilities	1	LS	$ 3,000	$ 3,000
5.	Survey	1	LS	$ 10,000	$ 10,000
6.	Project Temporary Traffic Control	1	LS	$ 18,000	$ 18,000
7.	Removal of Unsuitable Material (Trench)	80	CY	$ 25	$ 2,000
8.	Trench Excavation Safety Systems	1	LS	$ 1,000	$ 1,000
9.	Crushed Surfacing Top Course	55	TN	$ 45	$ 2,494
10.	Crushed Surfacing Base Course	120	TN	$ 45	$ 5,400
11.	Sawcutting	1,400	LF	$ 5	$ 7,000
12.	HMA CL 1/2" PG 58H-22	70	TN	$ 180	$ 12,600
13.	Temporary Storm Bypass Pumping	1	LS	$ 3,500	$ 3,500
14.	CPEP Storm Sewer Pipe, 12-inch Diam (Incl. Bedding)	665	LF	$ 80	$ 53,200
15.	Catch Basin Type 1	3	EA	$ 3,000	$ 9,000
16.	Connection to Existing Storm System	2	EA	$ 1,500	$ 3,000
17.	Bank Run Gravel for Trench Backfill (1)	450	TN	$ 45	$ 20,250
18.	Erosion Control and Water Pollution Prevention	1	LS	$ 1,000	$ 1,000
19.	Seeding, Fertilizing and Mulching	10	SY	$ 10	$ 100
20.	Topsoil Type A	5	CY	$ 100	$ 500
21.	Project Documentation	1	LS	$ 1,000	$ 1,000
	Subtotal				$ 181,044
	Construction Contingencies (30%)				$ 54,313
	Subtotal				$ 235,357
	Sales Tax (7.8%)				$ 18,358
	Total Construction Cost				**$ 253,715**
	Design, Construction Administration Services and Permitting (30%)				$ 71,000
	Total Project Cost (rounded)				**$ 325,000**

(1) Trench backfill was assumed to be 100% import

Inflation Rate:	**3.0%**
Project Cost (2034):	**$ 437,000**

CITY OF BRIDGEPORT
F4A: CHECK DAM & DRYWELL MAINTENANCE
PLANNING LEVEL COST ESTIMATE
Locate/Clean drywell overflow system
May 2024
G&O# 23851

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	AMOUNT
1.	Minor Changes	1	LS	$ 10,000	$ 10,000
2.	Mobilization, Cleanup and Demobilization	1	LS	$ 3,000	$ 3,000
3.	Locate Existing Utilities	1	LS	$ 3,000	$ 3,000
4.	Vactor Truck Rental	40	HR	$ 100	$ 4,000
5.	2-Person Crew	80	HR	$ 50	$ 4,000
6.	Project Documentation	1	LS	$ 1,000	$ 1,000

Subtotal	$	25,000
Construction Contingencies (30%)	$	7,500
Subtotal	$	32,500
Sales Tax (7.8%)	$	2,535
Total Construction Cost	**$**	**35,035**
Design, Construction Administration Services and Permitting (30%)	$	10,000
Total Project Cost (rounded)	**$**	**46,000**

(1) Trench backfill was assumed to be 100% import

Inflation Rate:		**3.0%**
Project Cost (2027):	**$**	**51,000**

CITY OF BRIDGEPORT
F4B: FEASIBILITY STUDY FOR SEDIMENT POND
PLANNING LEVEL COST ESTIMATE
Sediment Pond Feasibility Study
May 2024
G&O# 23851

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	AMOUNT
1.	Sediment Capture feasibility Study	1	LS	$ 30,000	$ 30,000

Subtotal	$	30,000
Construction Contingencies (30%)	$	9,000
Subtotal	$	39,000
Sales Tax (7.8%)	$	3,042
Total Construction Cost	**$**	**42,042**
Design, Construction Administration Services and Permitting (30%)	$	12,000
Total Project Cost (rounded)	**$**	**55,000**

(1) Trench backfill was assumed to be 100% import

Inflation Rate:		**3.0%**
Project Cost (2027):	**$**	**61,000**

CITY OF BRIDGEPORT
F5: 16TH STREET SHEET FLOW
PLANNING LEVEL COST ESTIMATE
Replace sheet flow with 415 LF 36" pipe
May 2024
G&O# 23851

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	AMOUNT
1.	Minor Changes	1	LS	$ 10,000	$ 10,000
2.	Mobilization, Cleanup and Demobilization	1	LS	$ 16,000	$ 16,000
3.	SPCC Plan	1	LS	$ 1,000	$ 1,000
4.	Locate Existing Utilities	1	LS	$ 3,000	$ 3,000
5.	Survey	1	LS	$ 8,000	$ 8,000
6.	Project Temporary Traffic Control	1	LS	$ 13,000	$ 13,000
7.	Removal of Unsuitable Material (Trench)	50	CY	$ 25	$ 1,250
8.	Trench Excavation Safety Systems	1	LS	$ 1,000	$ 1,000
9.	Crushed Surfacing Top Course	40	TN	$ 45	$ 1,800
10.	Crushed Surfacing Base Course	70	TN	$ 45	$ 3,150
11.	Sawcutting	100	LF	$ 5	$ 500
12.	HMA CL 1/2" PG 58H-22	50	TN	$ 180	$ 9,000
13.	Temporary Storm Bypass Pumping	1	LS	$ 2,500	$ 2,500
14.	CPEP Storm Sewer Pipe, 36-inch Diam (Incl. Bedding)	420	LF	$ 160	$ 67,200
15.	Catch Basin Type 2, 48 In Diam.	2	EA	$ 8,000	$ 16,000
16.	Connection to Existing Storm System	1	EA	$ 1,500	$ 1,500
17.	Bank Run Gravel for Trench Backfill (1)	290	TN	$ 45	$ 13,050
18.	Erosion Control and Water Pollution Prevention	1	LS	$ 1,000	$ 1,000
19.	Seeding, Fertilizing and Mulching	10	SY	$ 10	$ 100
20.	Topsoil Type A	5	CY	$ 100	$ 500
21.	Project Documentation	1	LS	$ 1,000	$ 1,000
	Subtotal				$ 170,550
	Construction Contingencies (30%)				$ 51,165
	Subtotal				$ 221,715
	Sales Tax (7.8%)				$ 17,294
	Total Construction Cost				**$ 239,009**
	Design, Construction Administration Services and Permitting (30%)				$ 67,000
	Total Project Cost (rounded)				**$ 307,000**

(1) Trench backfill was assumed to be 100% import

Inflation Rate:	**3.0%**
Project Cost (2029):	**$ 356,000**

CITY OF BRIDGEPORT
M1: 17TH AND 16TH STREET CONVEYANCE UPSIZING
PLANNING LEVEL COST ESTIMATE
Upsize 1,900 LF of 16" pipe to 24" pipe
May 2024
G&O# 23851

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	AMOUNT
1.	Minor Changes	1	LS	$ 10,000	$ 10,000
2.	Mobilization, Cleanup and Demobilization	1	LS	$ 49,000	$ 49,000
3.	SPCC Plan	1	LS	$ 1,000	$ 1,000
4.	Locate Existing Utilities	1	LS	$ 3,000	$ 3,000
5.	Survey	1	LS	$ 10,000	$ 10,000
6.	Project Temporary Traffic Control	1	LS	$ 48,000	$ 48,000
7.	Removal of Unsuitable Material (Trench)	220	CY	$ 25	$ 5,500
8.	Excavation, Embankment and Grading, Incl. Haul	270	CY	$ 60	$ 16,200
8.	Trench Excavation Safety Systems	1	LS	$ 1,000	$ 1,000
9.	Crushed Surfacing Top Course	158	TN	$ 45	$ 7,125
10.	Crushed Surfacing Base Course	320	TN	$ 45	$ 14,400
11.	Sawcutting	3,900	LF	$ 5	$ 19,500
12.	HMA CL 1/2" PG 58H-22	190	TN	$ 180	$ 34,200
13.	Temporary Storm Bypass Pumping	1	LS	$ 9,500	$ 9,500
14.	CPEP Storm Sewer Pipe, 24-inch Diam (Incl. Bedding)	1,900	LF	$ 100	$ 190,000
15.	Catch Basin Type 2, 48 In Diam.	4	EA	$ 8,000	$ 32,000
16.	Connection to Existing Storm System	6	EA	$ 1,500	$ 9,000
17.	Bank Run Gravel for Trench Backfill (1)	1,280	TN	$ 45	$ 57,600
18.	Erosion Control and Water Pollution Prevention	1	LS	$ 1,000	$ 1,000
19.	Seeding, Fertilizing and Mulching	450	SY	$ 10	$ 4,500
20.	Topsoil Type A	115	CY	$ 100	$ 11,500
21.	Project Documentation	1	LS	$ 1,000	$ 1,000
	Subtotal				$ 535,025
	Construction Contingencies (30%)				$ 160,508
	Subtotal				$ 695,533
	Sales Tax (7.8%)				$ 54,252
	Total Construction Cost				**$ 749,784**
	Design, Construction Administration Services and Permitting (30%)				$ 209,000
	Total Project Cost (rounded)				**$ 959,000**

(1) Trench backfill was assumed to be 100% import

Inflation Rate:	**3.0%**
Project Cost (2032):	**$ 1,215,000**

APPENDIX C

UTILITY ORDINANCE EXAMPLES

ORDINANCE NO. ____

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF BRIDGEPORT RELATING TO SURFACE AND STORMWATER DRAINAGE, ESTABLISHING A STORMWATER UTILITY AND TRANSFERRING ALL RIGHTS AND INTERESTS NOW OWNED BY THE CITY AND PERTAINING TO SURFACE AND STORMWATER DRAINAGE TO THE UTILITY.

WHEREAS, the City is authorized pursuant to the general police powers, RCW 35.67.020 and RCW 35.92.020, to construct, condemn and purchase, acquire, add to, maintain, conduct and operate a storm drainage system; and

WHEREAS, pursuant to the Constitution of the State of Washington, Article 11, Section 11, cities have the power to enact regulations in the interest of the health, safety and welfare of its residents; and

WHEREAS, the City Council of the City of Bridgeport has expressed concern regarding the control and prevention of flooding, erosion, sedimentation and surface and stormwater quality degradation pursuant to an overall management plan; and

WHEREAS, after review of the various presentations made to the City Council, the City Council finds specifically that land use and development affecting surface and stormwater should be managed, regulated and controlled under the unified management of a Stormwater Utility to reduce or control flooding, erosion, sedimentation, and particulate and other pollution of surface and stormwater, danger and damage to life and property, and to protect and encourage the use of natural and efficient man-made means to these ends and that a comprehensive stormwater plan should be adopted for such purposes; and

WHEREAS, to research and correct these problems in a cost-effective manner, acceptable to the City, requires a source of revenue to pay for the associated costs; and

WHEREAS, it is the desire of the City to incorporate into the proposed utility all surface water courses the title to which is now held or in the future will be held by the City,

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BRIDGEPORT, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. Definitions. The following words when used herein shall have the following meanings, unless the context clearly indicates otherwise:

A. "Comprehensive Stormwater Plan" means a plan, developed for the purposes of mapping and analyzing the City's surface and stormwater drainage system, identifying problem areas, and providing recommendations for capital improvements, best management practices, policy changes, and funding.

B. “Service Charge” means the monthly fee levied by the Utility upon all developed real property within the boundaries of the Utility as authorized by Sections 2 and 3 of this ordinance.

C. “Storm Drainage System” means constructed drainage facilities and any natural surface water drainage features that provide any combination of collecting, storing, controlling, treating or conveying surface and stormwater.

D. “Stormwater” means water originating from rainfall and other precipitation that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes, and wetlands, as well as shallow groundwater.

E. “System Development Charge” means that fee authorized by the Council and charged by the Utility to property which is developed after the effective date of this ordinance, which charge reflects a proportionate share of the Utility's capital costs attributable to the newly developed property.

F. “Utility” means the City of Bridgeport, Washington Stormwater Utility, a utility which operates and maintains the surface and stormwater drains, channels and facilities, outfalls for storm drainage and the rights and interests in property relating to the system. The boundaries of the utility are the corporate limits of the City.

Section 2. Creation of Stormwater Utility.

A. There is hereby created and established a surface and stormwater utility which shall be known as the "City of Bridgeport, Washington, Stormwater Utility" (the "Utility"), for the purposes set forth in Section 2. B.

B. The City shall exercise, through the Utility where possible, all the lawful powers necessary and appropriate to the construction, condemnation and purchase, acquisition, addition to, maintenance, conduct and operation, management, regulation and control of the surface and stormwater within the boundaries of the City, as necessary to protect the health, safety, and welfare of the citizens of the City; including, without limitation, all the lawful powers to fix, alter, regulate and control the rates, charges and conditions for the use thereof, to purchase and condemn property on behalf of the Utility, to regulate actions taken with respect to public and private property which affect the flow of surface and stormwater and the use of drainage facilities, and to adopt, alter, and amend a plan adopted as necessary to implement the policies of the City pertaining to surface and stormwater drainage.

C. It is not the purpose of this ordinance to create a duty of the City or its Utility to insure or protect individual persons or property against water drainage.

Section 3. Administrator of Utility. The City Administrator or the official designated by the City Administrator shall be administrator of the Utility and shall report directly to the City Administrator.

Section 4. Stormwater Utility Fund.

A. There is hereby created a fund which shall be known as the "Stormwater Utility Fund". All revenues, assessments, and other charges collected by the Utility, or otherwise received for drainage purposes or attributable to the operation and maintenance of the Utility, and all loans to or grants or funds received for its construction, improvement and operation, shall be deposited in the Stormwater Utility Fund. All disbursements for costs of data collection, planning, designing, constructing, acquiring, maintaining, operating, and improving the drainage utility facilities, whether such facilities are natural, constructed or both, and administering the Utility shall be made from the Stormwater Utility Fund.

B. The City may create, at such time or times as it deems appropriate, any other funds necessary to the administration of the Stormwater Utility and may designate the revenues to be placed therein and the purpose or purposes of such funds which may be the same as one, some or all of the purposes designated in this section as the purposes of the Stormwater Utility Fund created herein, and such purposes shall then be transferred to such newly created fund.

Section 5. Authority to Establish Rates and Charges. The City shall establish by ordinance rate classifications, service charges, general facilities charges, inspection, permitting, application, and such other fees and charges necessary and sufficient in the opinion of the City Council to pay for the following:

A. The costs associated with the development and adoption of a comprehensive stormwater plan;

B. The costs, including debt service and related financing expenses, for the construction, and reconstruction of storm drainage facilities necessary or useful for the handling of surface and stormwater within the City, but not presently in existence;

C. The operation, repair, maintenance, improvement, replacement and reconstruction of storm drainage facilities within the City which presently exist;

D. The acquisition of real property interests, which may be useful or necessary for the storm drainage system in the City including but not limited to land necessary for the installation and construction of storm drainage facilities, and all other facilities, including retention and detention facilities, which are reasonably required for proper and adequate handling of stormwater within the City;

E. The costs of monitoring, inspection, enforcement and administration of the Utility including but not limited to water quality surveillance, private drainage facility maintenance inspection, construction inspection and other activities which are reasonably required for the proper and adequate implementation of the City's surface and stormwater policies;

F. The construction and subsequent maintenance of those future facilities as required by the Utility; and

G. Creation and implementation of ordinances, policies, standards, and procedures for the purposes of gaining compliance with state or federal rules and regulations.

The fees and charges to be paid and collected pursuant hereto shall not be used for general or other governmental or proprietary purposes of the City, except to pay for the equitable share of the costs of accounting, management, legally levied taxes, and government thereof incurred on behalf of the Utility.

Section 6. Limitation of Liability. This ordinance, any drainage code to be adopted by the City Council to implement this ordinance, and any guidelines, rules, standards, specifications, requirements, regulations and procedures established pursuant to any section of such code are intended to provide the authority and processes to achieve cost-effective surface and stormwater management in accordance with reasonable standards for such management in the City as necessary to protect the health, safety, and welfare of the citizens and of the City. No City liability shall be inferred, implied, or interpreted by the adoption and application of this ordinance for damages to individual persons or properties which result from existing conditions or which occur subsequent to the date of this Ordinance. There shall be no liability associated with the Utility's approval of any privately constructed portion of the storm drainage system and/or privately maintained portion of the storm drainage system unless the City accepts the same as part of its publicly owned and/or maintained system.

Section 7. Severability. If any portion of this ordinance as now or hereafter amended, or its application to any person or circumstances, is held invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole, or any section, provision or part thereof not adjudged to be invalid or unconstitutional, and its application to other persons or circumstances shall not be affected.

Section 8. Effective Date. This Ordinance shall take effect and be in force five (5) days after its passage, approval and publication according to law.

PASSED BY THE CITY COUNCIL OF THE CITY OF BRIDGEPORT THIS 15TH DAY OF _____2024; AND SIGNED IN AUTHENTICATION OF ITS PASSAGE THIS __TH DAY OF _____ 2024.

_____

_____, Mayor

ATTESTED BY:

_____

_____, Clerk

APPROVED AS TO FORM:

_____

_____
, City Attorney

AYES:
NAYS:
ABSENT:
EXCUSED:

ORDINANCE NO. ___

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF BRIDGEPORT ESTABLISHING A RATE STRUCTURE POLICY FOR THE STORMWATER UTILITY OF THE CITY OF BRIDGEPORT, WASHINGTON, ESTABLISHING SERVICE CHARGES FOR SUCH UTILITY, PROVIDING AUTHORITY FOR THE COLLECTION THEREOF.

WHEREAS, the City of Bridgeport, Washington (the "City"), created a Stormwater Utility to implement and administer its Stormwater Management Program; and

WHEREAS, the City is authorized pursuant to the general police powers, RCW 35.67.020 and RCW 35.92.020, to fix, alter, regulate and control the rates and charges for use of said Utility and the Stormwater Management Program of the City; and

WHEREAS, the City Council finds that it is now necessary to establish rates and charges for the payment of the cost and expense of operating said Utility; and

WHEREAS, the City Council finds that all developed real property within the boundaries of the Utility benefits from the Stormwater Utility of the City and should participate financially in the payment of all expenses for maintenance, operation and improvement of said storm drainage system and for administration of the Utility;

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF BRIDGEPORT, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. Definitions. The following words when used herein shall have the following meanings, unless the context clearly indicates otherwise:

A. "Best Management Practices" ("BMPs") means the best available and reasonable physical, structural, managerial, or behavioral activities, that when used singly or in combination, eliminate or reduce the contamination of surface and/or ground water.

B. "Commercial Properties" include commercial, multifamily residential – 3 units or greater, industrial and institutional properties.

C. "Developed" means that condition of real property altered from its natural state by the addition to or construction on such property of impervious ground surface or other manmade physical improvements such that the drainage characteristics of the property or portion thereof is affected.

D. "Duplex" means any structure which contains no more than 2 residences or 2 residential units which are within a single structure and are used primarily for residential purposes

E. "Dwelling Unit – Single-family" means a structure consisting of one detached building in which there are facilities for the living accommodations of one family.

F. "Equivalent Residential Unit" ("ERU") means and shall be equal to 5,000 square feet of Impervious Surface and is the measure of Impervious Surface to be used by the Utility in assessing Service Charges against each parcel of property.

G. "Impervious Surface" means a hard surface area which either prevents or retards the entry of water into the soil mantle as it entered under natural conditions prior to development, or

a hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roofs, sidewalks, walkways, patios, concrete or asphalt paving, driveways, parking lots, storage areas, areas which are paved, graveled, or made of packed earthen materials and other surfaces which similarly impede the natural infiltration of surface and storm water. Open, uncovered flow control or water quality treatment facilities shall not be considered as impervious surfaces.

H. “Manual” means the most recently City-adopted technical drainage manual that describes the requirements for drainage review, drainage plan and report submittal, hydrologic analysis and design, flow control design, water quality design, and other technical requirements.

I. "Natural Surface Water Drainage System" means such landscape features as rivers, streams, lakes and wetlands.

J. "Parcel" means the smallest separately segregated unit or plot of land having an identified owner, boundaries and surface area which is documented for property tax purposes and given a tax lot number by the Cowlitz County assessor.

K. "Person" means any individual, firm, company, association, corporation or governmental agency.

L. "Program" means the Stormwater Management Program.

M. "Service Charge" means the monthly fee levied by the Utility upon all developed real property within the boundaries of the Utility as authorized by Sections 2 and 3 of this ordinance.

N. “Storm Drainage System” means constructed drainage facilities and any natural surface water drainage features that do any combination of collecting, storing, controlling, treating or conveying surface and stormwater.

O. Stormwater" means water originating from rainfall and other precipitation that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes, and wetlands, as well as shallow groundwater.

P. “Stormwater Management Program” means the services provided by the City relating to surface and stormwater drainage, including but not limited to, basin planning, facilities operations and maintenance, regulation, financial administration, public involvement, drainage investigation and enforcement, aquatic resource restoration, surface and stormwater quality and environmental monitoring, natural surface water drainage system planning, intergovernmental relations and facility design and construction.

Q. "Undeveloped Parcel" means any parcel, which has not been altered from its natural state by the construction, creation or addition of impervious surface.

R. “Utility” means the City of Bridgeport, Washington Stormwater Utility, a utility which operates and maintains the surface and storm water drains, channels and facilities, outfalls for storm drainage and the rights and interests in property relating to the system. The boundaries of the utility are the corporate limits of the City.

S. "Water Quality Treatment Facility" means a drainage facility designed to reduce pollutants once they are already contained in surface and storm water runoff. Water quality treatment facilities are the structural component of BMPs. When used singly or in combination, water quality treatment facilities reduce the potential for contamination of surface and/or ground water.

Section 2. Rate Structure.

A. It shall be the policy of the City that the rate structure to be applied in establishing the amount of Service Charges assessed against each parcel of developed real property within the boundaries of the Utility shall be based upon the amount of Impervious Surface contained within each parcel of property as set forth below.

B. The City shall determine the service charge for each parcel within the service area by the following methodology:

1. All single family dwelling units and accessory uses thereof are deemed to contain one (1) Equivalent Residential Unit.

2. Each residential unit in an attached townhome structure shall be deemed to contain one-half (1/2) Equivalent Residential Unit.

3. Each dwelling unit of a duplex or triplex structure is deemed to contain one (1) Equivalent Residential Unit for the first residential unit on the parcel and one quarter (¼) ERU for additional residential unit on the parcel.

4. For all other developed real properties within the Utility boundaries, the Utility shall determine the number of Equivalent Residential Units by dividing the number of square feet of Impervious Surface on each property by 5,000 square feet per ERU; the total thus obtained will be rounded to the nearest quarter (1/4) representing the Equivalent Residential Units contained on such property. Each developed parcel of property shall be deemed to comprise a minimum of one Equivalent Residential Unit.

C. Property Exempt from Service Charges. The following special categories of property are exempt from Service Charges:

1. City street rights-of-way;
2. Washington State rights-of-way: and
3. Undeveloped parcels.

Section 3. Service Charge Rates. In accordance with the rate structure set forth in Section 2 of this ordinance, there is hereby levied upon all developed real property within the boundaries of the Utility the following Service Charges which shall be collected from the owners of such properties:

A. For all single family dwelling units and accessory uses thereof, (One Equivalent Residential Unit), the monthly Service Charge shall be $____ per month.

B. For all other developed property within the boundaries of the Utility, unless exempt as set forth above, the monthly Service Charge shall be $____ per month per ERU multiplied by the number of Equivalent Residential Units determined by the Utility to be contained in such parcel.

Section 4. Rate Adjustments and Appeals.

A. Any person billed for service charges may file a "request for rate adjustment" with the City within two years of the date from which the bill was sent. Rate adjustment request forms shall be available at the City Clerks' office. However, filing of such request does not extend the period for payment of the charge.

B. Requests for rate adjustment may be granted or approved by the City Administrator only when at least one of the following conditions exist:

1. The service charge bill was otherwise not calculated in accordance with this ordinance.

C. The property owner shall have the burden of proving that the rate adjustment sought should be granted.

D. Decisions on requests for rate adjustments shall be made by the City Administrator based on information submitted by the applicant within thirty days of the adjustment request except when additional information is needed. The applicant shall be notified in writing of the City's decision. If an adjustment is granted which reduces the charge for the current year or two prior years, the applicant shall be refunded the amount overpaid in the current and two prior years.

E. If the City Administrator finds that a service charge bill has been undercharged, then an amended bill shall be issued which reflects the increase in the service charge. The City may include in the bill the amount undercharged for two previous billing years in addition to the current bill.

F. Decisions of the City Administrator, on requests for rate adjustments shall be final unless within thirty days of the date the decision was mailed, the applicant submits in writing to the City Administrator a notice of appeal setting forth a brief statement of the grounds for appeal and requesting a hearing before the Hearings Examiner.

Section 5. Billing Procedure and Collection.

A. All property subject to charges of the program shall be billed based on the property characteristics existing one month prior billing. All property is billed monthly beginning January 1st of each year.

B. All Service Charges and all other fees or charges hereafter established by the City Council by ordinance shall be deemed to be levied upon real property.

C. The City shall have a lien for all delinquent and unpaid charges and fees for storm drainage purposes, including without limitation Service Charges, assessed against all parcels to which service was furnished, which lien shall have the superiority established by RCW §35.67.200 and shall be foreclosed in the manner provided in RCW §35.67.220 et seq.

D. Service charges shall be deemed delinquent if not paid by the end of the month of the billing date. A late charge equal to 10 percent or $5, whichever is greater, of the delinquent service charge shall be imposed at the time of such delinquency and interest at the rate of 12 per cent per annum shall be charged on all delinquent service charges and late charges. If the delinquent service charge or imposed interest is usurious under Washington law, then the maximum charge and/or interest rate allowable by law will be imposed.

Section 6. Annual Review of Charges and Fees. The charges and fees established by this ordinance and any other ordinances of the City Council establishing charges and fees for the Utility may be reviewed annually by the City Council.

Section 7. Effective Date of Service Charge. The Service Charge herein established shall apply to on or after _____ and shall be billed beginning in _____.

Section 8. Severability. If any portion of this ordinance as now or hereafter amended, or its application to any person or circumstances, is held invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole, or any section, provision or part thereof not adjudged to be invalid or unconstitutional, and its application to other persons or circumstances shall not be affected.

Section 9. Effective Date. This Ordinance shall take effect and be in force five (5) days after its passage, approval and publication according to law.

PASSED BY THE CITY COUNCIL OF THE CITY OF BRIDGEPORT THIS____ DAY OF _____, 2024; AND SIGNED IN AUTHENTICATION OF ITS PASSAGE THIS _____ DAY OF_____ , 2024.

_____
_____, Mayor

ATTESTED BY:

_____
_____, Clerk

APPROVED AS TO FORM:

_____
City Attorney

AYES:
NAYS:
ABSENT:
EXCUSED:

APPENDIX D

FINANCE TABLES

Scenario A - All CIPs Paid w/in 10 Years by Utility

		Annual Stormwater Incr.: 2.00%						Inflation: 3.00%		Growth Rate : 1.0%	
Year	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**
Beginning fund		$ -	$ 127,706	$ 321,662	$ 117,205	$ 91,277	$ 420,549	$ 371,716	$ 721,214	$ 1,081,286	$ 1,452,252
Revenue											
ERUs		754	762	769	777	785	792	800	808	816	825
Monthly Service Rate		$ 42.00	$ 42.00	$ 42.84	$ 43.70	$ 44.57	$ 45.46	$ 46.37	$ 47.30	$ 48.24	$ 49.21
Total Service Rate		$ 380,016	$ 383,816	$ 395,407	$ 407,349	$ 419,651	$ 432,324	$ 445,380	$ 458,831	$ 472,687	$ 486,963
Total Revenue		*$ 380,016*	*$ 383,816*	*$ 395,407*	*$ 407,349*	*$ 419,651*	*$ 432,324*	*$ 445,380*	*$ 458,831*	*$ 472,687*	*$ 486,963*
Expenses											
Yearly O&M		$ 70,000	$ 72,100	$ 74,263	$ 76,491	$ 78,786	$ 81,149	$ 83,584	$ 86,091	$ 88,674	$ 91,334
Total Expense		*$ 70,000*	*$ 72,100*	*$ 74,263*	*$ 76,491*	*$ 78,786*	*$ 81,149*	*$ 83,584*	*$ 86,091*	*$ 88,674*	*$ 91,334*
Capital Reserve		$ 310,016	$ 439,422	$ 642,807	$ 448,063	$ 432,142	$ 771,724	$ 733,513	$ 1,093,954	$ 1,465,300	$ 1,847,880
CIP Projects											
F1A	*$ 167,000*	$ 172,010									
F1B	*$ 471,000*			$ 514,674							
F2	*$ 325,000*						$ 388,067				
F4A	*$ 46,000*		$ 48,801								
F4B	*$ 55,000*		$ 58,350								
M1	*$ 959,000*										$ 1,251,277
F5	*$ 307,000*				$ 345,531						
Miscellaneous Projects	$ 10,000	$ 10,300	$ 10,609	$ 10,927	$ 11,255	$ 11,593	$ 11,941	$ 12,299	$ 12,668	$ 13,048	$ 13,439
CIP Total		**$ 182,310**	**$ 117,760**	**$ 525,602**	**$ 356,786**	**$ 11,593**	**$ 400,008**	**$ 12,299**	**$ 12,668**	**$ 13,048**	**$ 1,264,717**
Year End Total		**$ 127,706**	**$ 321,662**	**$ 117,205**	**$ 91,277**	**$ 420,549**	**$ 371,716**	**$ 721,214**	**$ 1,081,286**	**$ 1,452,252**	**$ 583,164**
6 Month Operating Check		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

=High Priority =Medium Priority =Low Priority

Scenario B - All CIPs Paid w/in 20 Years by Utility

		Annual Stormwater Incr.: 2.0%					Inflation: 3.00%				Growth Rate: 1.0%				Loan interest: 2.0%			Loan term (yrs): 10				
Year	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
Beginning fund		$ -	$ 163,996	$ 155,790	$ 219,509	$ 398,867	$ 583,660	$ 211,653	$ 407,813	$ 609,916	$ 818,142	$ 620,095	$ 841,130	$ 605,489	$ 840,121	$ 1,081,861	$ 1,330,925	$ 1,587,536	$ 266,840	$ 539,235	$ 819,884
Revenue																					
ERUs		754	762	769	777	785	792	800	808	816	825	833	841	850	858	867	875	884	893	902	911
Monthly Service Rate		$ 27.00	$ 27.54	$ 28.09	$ 28.65	$ 29.23	$ 29.81	$ 30.41	$ 31.01	$ 31.63	$ 32.27	$ 32.91	$ 33.57	$ 34.24	$ 34.93	$ 35.63	$ 36.34	$ 37.07	$ 37.81	$ 38.56	$ 39.33
Total Service Rate		$ 244,296	$ 251,674	$ 259,274	$ 267,104	$ 275,171	$ 283,481	$ 292,042	$ 300,862	$ 309,948	$ 319,308	$ 328,951	$ 338,886	$ 349,120	$ 359,664	$ 370,525	$ 381,715	$ 393,243	$ 405,119	$ 417,354	$ 429,958
Total Revenue		*$ 244,296*	*$ 251,674*	*$ 259,274*	*$ 267,104*	*$ 275,171*	*$ 283,481*	*$ 292,042*	*$ 300,862*	*$ 309,948*	*$ 319,308*	*$ 328,951*	*$ 338,886*	*$ 349,120*	*$ 359,664*	*$ 370,525*	*$ 381,715*	*$ 393,243*	*$ 405,119*	*$ 417,354*	*$ 429,958*
Expenses																					
Yearly O&M		$ 70,000	$ 72,100	$ 74,263	$ 76,491	$ 78,786	$ 81,149	$ 83,584	$ 86,091	$ 88,674	$ 91,334	$ 94,074	$ 96,896	$ 99,803	$ 102,797	$ 105,881	$ 109,058	$ 112,329	$ 115,699	$ 119,170	$ 122,745
Total Expense		***$ 70,000***	***$ 72,100***	***$ 74,263***	***$ 76,491***	***$ 78,786***	***$ 81,149***	***$ 83,584***	***$ 86,091***	***$ 88,674***	***$ 91,334***	***$ 94,074***	***$ 96,896***	***$ 99,803***	***$ 102,797***	***$ 105,881***	***$ 109,058***	***$ 112,329***	***$ 115,699***	***$ 119,170***	***$ 122,745***
Capital Reserve		$ 174,296	$ 343,570	$ 340,802	$ 410,123	$ 595,253	$ 785,992	$ 420,111	$ 622,583	$ 831,190	$ 1,046,116	$ 854,972	$ 1,083,119	$ 854,806	$ 1,096,987	$ 1,346,505	$ 1,603,583	$ 1,868,449	$ 556,260	$ 837,419	$ 1,127,096
CIP Projects																					
F1A	*$ 167,000*		$ 177,170																		
F1B	*$ 471,000*						$ 562,399														
F2	*$ 325,000*												$ 463,372								
F4A	*$ 46,000*			$ 50,265																	
F4A	*$ 55,000*			$ 60,100																	
M1	*$ 959,000*																	$ 1,585,081			
F5	*$ 307,000*										$ 412,582										
Miscellaneous Projects	$ 10,000	$ 10,300	$ 10,609	$ 10,927	$ 11,255	$ 11,593	$ 11,941	$ 12,299	$ 12,668	$ 13,048	$ 13,439	$ 13,842	$ 14,258	$ 14,685	$ 15,126	$ 15,580	$ 16,047	$ 16,528	$ 17,024	$ 17,535	$ 18,061
CIP Total		**$ 10,300**	**$ 187,779**	**$ 121,293**	**$ 11,255**	**$ 11,593**	**$ 574,339**	**$ 12,299**	**$ 12,668**	**$ 13,048**	**$ 426,021**	**$ 13,842**	**$ 477,630**	**$ 14,685**	**$ 15,126**	**$ 15,580**	**$ 16,047**	**$ 1,601,609**	**$ 17,024**	**$ 17,535**	**$ 18,061**
Year End Total		**$ 163,996**	**$ 155,790**	**$ 219,509**	**$ 398,867**	**$ 583,660**	**$ 211,653**	**$ 407,813**	**$ 609,916**	**$ 818,142**	**$ 620,095**	**$ 841,130**	**$ 605,489**	**$ 840,121**	**$ 1,081,861**	**$ 1,330,925**	**$ 1,587,536**	**$ 266,840**	**$ 539,235**	**$ 819,884**	**$ 1,109,035**
6 Month Operating Check		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

=High Priority =Medium Priority =Low Priority

Scenario C - All CIPs Paid w/ Loan over 20 Years, Constructed in 10 Years

Annual Stormwater Incr.: 2.0% | Inflation: 3.00% | Growth Rate: 1.0% | Loan interest: 2.0% | Loan term (yrs): 20

Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Beginning fund		$ -	$ 100,660	$ 191,378	$ 278,338	$ 336,999	$ 375,151	$ 416,677	$ 461,678	$ 446,173	$ 434,358	$ 403,303	$ 376,166	$ 353,066	$ 334,125	$ 319,470	$ 309,230	$ 303,539	$ 302,537	$ 306,365	$ 315,169
Revenue																					
ERUs		754	762	769	777	785	792	800	808	816	825	833	841	850	858	867	875	884	893	902	911
Monthly Service Rate		$ 20.00	$ 20.40	$ 20.81	$ 21.22	$ 21.65	$ 22.08	$ 22.52	$ 22.97	$ 23.43	$ 23.90	$ 24.38	$ 24.87	$ 25.36	$ 25.87	$ 26.39	$ 26.92	$ 27.46	$ 28.00	$ 28.56	$ 29.14
Total Service Rate		$ 180,960	$ 186,425	$ 192,055	$ 197,855	$ 203,830	$ 209,986	$ 216,328	$ 222,861	$ 229,591	$ 236,525	$ 243,668	$ 251,027	$ 258,608	$ 266,417	$ 274,463	$ 282,752	$ 291,291	$ 300,088	$ 309,151	$ 318,487
Total Revenue		*$ 180,960*	*$ 186,425*	*$ 192,055*	*$ 197,855*	*$ 203,830*	*$ 209,986*	*$ 216,328*	*$ 222,861*	*$ 229,591*	*$ 236,525*	*$ 243,668*	*$ 251,027*	*$ 258,608*	*$ 266,417*	*$ 274,463*	*$ 282,752*	*$ 291,291*	*$ 300,088*	*$ 309,151*	*$ 318,487*
Expenses																					
Yearly O&M		$ 70,000	$ 74,263	$ 76,491	$ 78,786	$ 81,149	$ 83,584	$ 86,091	$ 88,674	$ 91,334	$ 94,074	$ 96,896	$ 99,803	$ 102,797	$ 105,881	$ 109,058	$ 112,329	$ 115,699	$ 119,170	$ 122,745	$ 126,428
Total Expense		*$ 70,000*	*$ 74,263*	*$ 76,491*	*$ 78,786*	*$ 81,149*	*$ 83,584*	*$ 86,091*	*$ 88,674*	*$ 91,334*	*$ 94,074*	*$ 96,896*	*$ 99,803*	*$ 102,797*	*$ 105,881*	*$ 109,058*	*$ 112,329*	*$ 115,699*	*$ 119,170*	*$ 122,745*	*$ 126,428*
Capital Reserve		$ 110,960	$ 212,822	$ 306,942	$ 397,407	$ 459,680	$ 501,554	$ 546,913	$ 595,864	$ 584,429	$ 576,808	$ 550,074	$ 527,390	$ 508,876	$ 494,661	$ 484,875	$ 479,652	$ 479,131	$ 483,455	$ 492,770	$ 507,228
CIP Projects																					
F1A	*$ 167,000*		$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835	$10,835
F1B	*$ 471,000*				$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476	$31,476
F2	*$ 325,000*										$23,042	$23,042	$23,042	$23,042	$23,042	$23,042	$23,042	$23,042	$23,042	$23,042	$23,042
F4A	*$ 46,000*			$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166	$ 3,166
F4B	*$ 55,000*			$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676	$ 3,676
M1	*$ 959,000*								$64,088	$64,088	$64,088	$64,088	$64,088	$64,088	$64,088	$64,088	$64,088	$64,088	$64,088	$64,088	$64,088
F5	*$ 307,000*					$23,784	$23,784	$23,784	$23,784	$23,784	$23,784	$23,784	$23,784	$23,784	$23,784	$23,784	$23,784	$23,784	$23,784	$23,784	$23,784
Miscellaneous Projects	$ 10,000	$ 10,300	$ 10,609	$ 10,927	$ 11,255	$ 11,593	$ 11,941	$ 12,299	$ 12,668	$ 13,048	$ 13,439	$ 13,842	$ 14,258	$ 14,685	$ 15,126	$ 15,580	$ 16,047	$ 16,528	$ 17,024	$ 17,535	$ 18,061
CIP Total		**$ 10,300**	**$ 21,444**	**$ 28,604**	**$ 60,408**	**$ 84,529**	**$ 84,877**	**$ 85,235**	**$ 149,692**	**$ 150,072**	**$ 173,505**	**$ 173,908**	**$ 174,323**	**$ 174,751**	**$ 175,192**	**$ 175,646**	**$ 176,113**	**$ 176,594**	**$ 177,090**	**$ 177,601**	**$ 178,127**
Year End Total		**$ 100,660**	**$ 191,378**	**$ 278,338**	**$ 336,999**	**$ 375,151**	**$ 416,677**	**$ 461,678**	**$ 446,173**	**$ 434,358**	**$ 403,303**	**$ 376,166**	**$ 353,066**	**$ 334,125**	**$ 319,470**	**$ 309,230**	**$ 303,539**	**$ 302,537**	**$ 306,365**	**$ 315,169**	**$ 329,101**
6 Month Operating Check		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

=High Priority =Medium Priority =Low Priority

Scenario D - O&M Only, No CIPs

		Annual Stormwater Incr.: 2.0%					Inflation: 3.00%				Growth Rate: 1.0%				Loan interest: 2.0%			Loan term (yrs): 20				
Year	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
Beginning fund		$ -	$ 20,480	$ 39,429	$ 58,966	$ 79,108	$ 99,874	$ 121,283	$ 143,356	$ 166,112	$ 189,574	$ 213,762	$ 238,699	$ 264,409	$ 290,916	$ 318,243	$ 346,417	$ 375,464	$ 405,410	$ 436,284	$ 468,114
Revenue																					
ERUs		754	762	769	777	785	792	800	808	816	825	833	841	850	858	867	875	884	893	902	911
Monthly Service Rate		$ 10.00	$ 10.20	$ 10.40	$ 10.61	$ 10.82	$ 11.04	$ 11.26	$ 11.49	$ 11.72	$ 11.95	$ 12.19	$ 12.43	$ 12.68	$ 12.94	$ 13.19	$ 13.46	$ 13.73	$ 14.00	$ 14.28	$ 14.57
Total Service Rate		$ 90,480	$ 93,212	$ 96,028	$ 98,928	$ 101,915	$ 104,993	$ 108,164	$ 111,430	$ 114,796	$ 118,262	$ 121,834	$ 125,513	$ 129,304	$ 133,209	$ 137,232	$ 141,376	$ 145,646	$ 150,044	$ 154,575	$ 159,244
Total Revenue		*$ 90,480*	*$ 93,212*	*$ 96,028*	*$ 98,928*	*$ 101,915*	*$ 104,993*	*$ 108,164*	*$ 111,430*	*$ 114,796*	*$ 118,262*	*$ 121,834*	*$ 125,513*	*$ 129,304*	*$ 133,209*	*$ 137,232*	*$ 141,376*	*$ 145,646*	*$ 150,044*	*$ 154,575*	*$ 159,244*
Expenses																					
Yearly O&M		$ 70,000	$ 74,263	$ 76,491	$ 78,786	$ 81,149	$ 83,584	$ 86,091	$ 88,674	$ 91,334	$ 94,074	$ 96,896	$ 99,803	$ 102,797	$ 105,881	$ 109,058	$ 112,329	$ 115,699	$ 119,170	$ 122,745	$ 126,428
Total Expense		*$ 70,000*	*$ 74,263*	*$ 76,491*	*$ 78,786*	*$ 81,149*	*$ 83,584*	*$ 86,091*	*$ 88,674*	*$ 91,334*	*$ 94,074*	*$ 96,896*	*$ 99,803*	*$ 102,797*	*$ 105,881*	*$ 109,058*	*$ 112,329*	*$ 115,699*	*$ 119,170*	*$ 122,745*	*$ 126,428*
Capital Reserve		$ 20,480	$ 39,429	$ 58,966	$ 79,108	$ 99,874	$ 121,283	$ 143,356	$ 166,112	$ 189,574	$ 213,762	$ 238,699	$ 264,409	$ 290,916	$ 318,243	$ 346,417	$ 375,464	$ 405,410	$ 436,284	$ 468,114	$ 500,930
CIP Projects																					
F1A	*$ 167,000*																				
F1B	*$ 471,000*																				
F2	*$ 325,000*																				
F4A	*$ 46,000*																				
F4B	*$ 55,000*																				
M1	*$ 959,000*																				
F5	*$ 307,000*																				
Miscellaneous Projects	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CIP Total		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Year End Total		**$ 20,480**	**$ 39,429**	**$ 58,966**	**$ 79,108**	**$ 99,874**	**$ 121,283**	**$ 143,356**	**$ 166,112**	**$ 189,574**	**$ 213,762**	**$ 238,699**	**$ 264,409**	**$ 290,916**	**$ 318,243**	**$ 346,417**	**$ 375,464**	**$ 405,410**	**$ 436,284**	**$ 468,114**	**$ 500,930**
6 Month Operating Check		NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

=High Priority =Medium Priority =Low Priority

APPENDIX E

ENVIRONMENTAL CHECKLIST

SEPA[1] Environmental Checklist

Purpose of checklist

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization, or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. **You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown.** You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to **all parts of your proposal**, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for lead agencies

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B, plus the Supplemental Sheet for Nonproject Actions (Part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in "Part B: Environmental Elements" that do not contribute meaningfully to the analysis of the proposal.

[1] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/Checklist-guidance

A.Background

Find help answering background questions[2]

1. **Name of proposed project, if applicable:**

   Stormwater Management Plan

2. **Name of applicant:**

   City of Bridgeport

3. **Address and phone number of applicant and contact person:**

   1206 Columbia Ave. PO Box 640 Bridgeport, WA 98813

   509-686-4041

   Stuart Dezellem, Public Work Superintendent

4. **Date checklist prepared:**

   March 2024

5. **Agency requesting checklist:**

   Department of Ecology

6. **Proposed timing of schedule (including phasing, if applicable):**

   N/A

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

   Plan proposes capital improvement projects improving the City's stormwater infrastructure.

8. **List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

   N/A

9. **Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.**

   None known.

10. **List any government approvals or permits that will be needed for your proposal, if known.**

    None known

11. **Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)**

[2] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-A-Background

The applicant proposes to prepare a Stormwater Management Plan to provide guidance in developing and/or replacing the City's stormwater infrastructure, improving the water quality of surface water within the surrounding drainage areas, and helping to address flooding concerns seen in select portions of the City.

12. **Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

    The proposed plan will cover the City of Bridgeport and its tributary basins outside the city limits.

B.Environmental Elements

1. Earth

Find help answering earth questions[3]

a. **General description of the site:**

    The area within the city limits is flat to moderate slope. There are steep slopes on hills above the City and on the banks of the Columbia River.

Circle or highlight one: Flat, rolling, hilly, steep slopes, mountainous, other:

b. **What is the steepest slope on the site (approximate percent slope)?**

    Slopes range from 0% to 60%

c. **What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them, and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.**

    The largest portion of soils within the city limits are Sandy Loams ranging from fine to gravelly. Much of the soils within the city limits are well drained.

d. **Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.**

    There are no surface indications or history of unstable soils in the immediate vicinity.

[3] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-b-environmental-elements/environmental-elements-earth

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

No filling or grading is required for the preparation of this stormwater plan. Minor grading is anticipated for CIPs involving stormwater retrofits.

f. Could erosion occur because of clearing, construction, or use? If so, generally describe.

Open construction excavations could expose soils to erosive forces such as wind and water. Construction work will include practices to prevent minor erosion problems that may occur at that time.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

This plan proposes no new impervious surface.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any.

Construction specifications will require submission of an erosion control plan and will require the use of Best Management Practices (BMPs) as defined by the Washington State Department of Ecology to control erosion.

2. Air

Find help answering air questions[4]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Exhaust emissions from construction equipment will occur as is typical during construction. Dust may be emitted during excavation and backfill operations.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

There are no off-site sources of emissions of odor that may affect the proposed improvements identified

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Construction specification may require watering during construction of the proposed improvements to control dust emissions.

[4] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-Air

3. Water

Find help answering water questions[5]

a. Surface:

Find help answering surface water questions[6]

1. **Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.**

   Yes, the City is located adjacent to the Columbia River. Three main seasonal streams are tributary to the City stormwater system.

2. **Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.**

   The plan does not anticipate any work in the river.

3. **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.**

   This plan does not propose any fill or dredging. Plan anticipates removal of an unknown amount of excess sediments from check dams and other drainage facilities.

4. **Will the proposal require surface water withdrawals or diversions? Give a general description, purpose, and approximate quantities if known.**

   The plan anticipates the possibility of stormwater bypass during stormwater retrofits.

5. **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

   No

6. **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

   This plan does not anticipate any waste discharge.

b. Ground:

Find help answering ground water questions[7]

[5] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-3-Water

[6] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-3-Water/Environmental-elements-Surface-water

[7] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-3-Water/Environmental-elements-Groundwater

1. **Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give a general description, purpose, and approximate quantities if known.**

   This plan does not propose any new wells nor discharges to ground water.

2. **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (domestic sewage; industrial, containing the following chemicals…; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

   This plan does not propose any new waste water discharge.

c. Water Runoff (including stormwater):

1. **Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

   This plan anticipates only retrofits to existing stormwater system.

2. **Could waste materials enter ground or surface waters? If so, generally describe.**

   No

3. **Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.**

   This plan does not propose to alter drainage patterns.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

Methods to minimize and mitigate construction related erosion will be provided within the construction specifications. Methods include the placement of filter fabric over catch basins (if any) to restrict silt from entering the existing storm drainage system. Disturbed areas will be covered during rain events to minimize turbid runoff. Disturbed vegetated areas, if any, will be seeded with grass and native vegetation to minimize erosion potential.

4. Plants

Find help answering plants questions

a. Check the types of vegetation found on the site:

☒ **deciduous tree: alder, maple, aspen, other**

☒ **evergreen tree: fir, cedar, pine, other**

☒ **shrubs**

☒ **grass**

☐ **pasture**

☐ **crop or grain**

☒ **orchards, vineyards, or other permanent crops.**

☐ **wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other**

☐ **water plants: water lily, eelgrass, milfoil, other**

☐ **other types of vegetation**

b. What kind and amount of vegetation will be removed or altered?

This plan does not propose vegetation removal. CIPs may require removal of vegetation during construction.

c. List threatened and endangered species known to be on or near the site.

There are no known threatened or endangered plant species on or near the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any.

Any disturbed vegetated areas will be replaced in kind.

e. List all noxious weeds and invasive species known to be on or near the site.

Class A

Flowering Rush; Variable-Leaf Milfoil

Class B

Brazilian Elodea, Butterflybush; Dalmatian Toadflax; Eurasian Watermilfoil; Houndstongue; Knapweed, Diffuse; Knapweed, Russian; Knapweed, Spotted; Knotweed, Japanese; Kochia; Loosestrife, Purple; Perennial Pepperweed; Poison Hemlock; Puncturevine; Raveena Grass; Rush Skeleton Weed; Saltcedar; Spurge, Leafy; Spurge, Myrtle; Thistle, Musk; Thistle, Scotch; Yellow Archangel; Yellow Starthistle

Class C

Absinth Wormwood; Babysbreath; Buffalobur; Ceral Rye; Common Groundsel; Common St. Johnswort; Common Tansy; Common Teasel; Evergreen Blackberry; Field Bindweed; Hoary Cress; Jointed Goatgrass; Lawnweed; Longspine Sandbur; Old Man's Beard; Perennial Sowthistle; Reed Canary Grass; Russion Olive; Scentless Maywedd; Thistle, Bull; Thistle, Canada; Tree-of-Heaven; Yellow Flag Iris

5. Animals

Find help answering animal questions[8]

a. **List any birds and other animals that have been observed on or near the site or are known to be on or near the site.**

   Examples include:

   - **Birds: hawk, heron, eagle, songbirds, other:**
   - **Mammals: deer, bear, elk, beaver, other:**
   - **Fish: bass, salmon, trout, herring, shellfish, other:**

b. **List any threatened and endangered species known to be on or near the site.**

   The following species are listed for the area:

   Yellow-billed Cuckoo, threatened; Bull Trout, threatened; Gray wolf, endangered

c. **Is the site part of a migration route? If so, explain.**

   No

d. **Proposed measures to preserve or enhance wildlife, if any.**

   There are no measures to preserve or enhance wildlife at this time.

e. **List any invasive animal species known to be on or near the site.**

   Northern/Red Swamp Crayfish are known to be present in the Columbia River.

6. Energy and natural resources

Find help answering energy and natural resource questions[9]

a. **What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.**

   The plan requires no new energy uses.

b. **Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.**

   The plan proposes no impact to solar energy use.

c. **What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any.**

[8] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-5-Animals
[9] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-6-Energy-natural-resou

The plan proposes no energy conservation measures.

7. Environmental health

Health Find help with answering environmental health questions[10]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur because of this proposal? If so, describe.

1. **Describe any known or possible contamination at the site from present or past uses.**

   There are no known contamination sites from the present or past.

2. **Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.**

   The plan does not anticipate hazardous chemical use.

3. **Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.**

   The plan does not propose storage of chemicals.

4. **Describe special emergency services that might be required.**

   No special emergency services are anticipated.

5. **Proposed measures to reduce or control environmental health hazards, if any.**

   The plan does not anticipate environmental health hazards.

b. Noise

1. **What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?**

   The plan does not anticipate any noise impacts.

2. **What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site)?**

   The plan does not create any noise impacts. CIP construction may have short term noise produced by equipment.

[10] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-7-Environmental-health

3. **Proposed measures to reduce or control noise impacts, if any:**

   Planned Maintenance activities will take place during normal daytime working hours. During CIP construction, activities will be limited to normal daytime working hours.

8. Land and shoreline use

Find help answering land and shoreline use questions[11]

a. **What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.**

   The plan proposes no change to land use.

b. **Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses because of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?**

   The plan proposes no change to land use.

   1. **Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how?**

      The plan proposes no change to working farm or forest land.

c. **Describe any structures on the site.**

   The plan does not propose any new structures or modification to existing structures.

d. **Will any structures be demolished? If so, what?**

   The plan does not propose any demolition of existing structures.

e. **What is the current zoning classification of the site?**

   The plan covers the entire city which is a mix of single family, multifamily and commercial zoning.

f. **What is the current comprehensive plan designation of the site?**

   The plan covers the entire city.

g. **If applicable, what is the current shoreline master program designation of the site?**

   N/A

[11] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-8-Land-shoreline-use

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

The plan discusses the critical areas that have been observed within the City limits.

i. Approximately how many people would reside or work in the completed project?

The plan covers the entire city, as of 2015 the population of the City was 2,596 people.

j. Approximately how many people would the completed project displace?

The plan does not propose any displacement.

k. Proposed measures to avoid or reduce displacement impacts, if any.

N/A

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.

The plan will not modify land use.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

The plan will not impact agricultural and forest lands.

9. Housing

Find help answering housing questions[12]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

The plan proposes not new housing.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

The plan proposes no new housing

c. Proposed measures to reduce or control housing impacts, if any:

The plan will not impact housing

10. Aesthetics

Find help answering aesthetics questions[13]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The plan proposes no new structures.

b. What views in the immediate vicinity would be altered or obstructed?

[12] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-9-Housing
[13] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-10-Aesthetics

The plan proposes no impacts to views.

c. Proposed measures to reduce or control aesthetic impacts, if any:

The plan proposes maintenance activities which cause temporary aesthetic impacts but improve the City's aesthetic in the long term. Including sweeping of the streets and cleaning and retrofitting existing drainage ditches.

11. Light and glare

Find help answering light and glare questions[14]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The plan proposes no glare impacts.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No

c. What existing off-site sources of light or glare may affect your proposal?

No existing light sources are anticipated to impact the plan.

d. Proposed measures to reduce or control light and glare impacts, if any:

The plan does not propose any impacts to light or glare.

12. Recreation

Find help answering recreation questions

a. What designated and informal recreational opportunities are in the immediate vicinity?

City has multiple parks and ball fields for recreational use.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The plan does not propose any displacement of recreational use.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

The plan does not propose any impacts to recreation.

[14] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-11-Light-glare

13. Historic and cultural preservation

Find help answering historic and cultural preservation questions[15]

a. **Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.**

   None known.

b. **Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.**

   None known.

c. **Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.**

   His plan has not performed a cultural

d. **Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.**

   During CIP construction, if any locations are found to contain objects of suspected historical interest work will halt immediately and appropriate State or tribal authorities will be contacted. If the project is state funded the City will administer the project per Executive Order 05-05.

14. Transportation

Find help with answering transportation questions[16]

a. **Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.**

   The plan covers maintenance activities for the City Wide Storm System.

b. **Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?**

   Not Known.

[15] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-13-Historic-cultural-p
[16] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-14-Transportation

c. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle, or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The plan proposes maintenance to existing roads and stormwater system. CIP construction may involve improvements to roads to be determined during design.

d. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

None known

e. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The plan does not propose vehicle travel. CIPs construction will involve vehicle travel which will be determined during design.

f. Will the proposal interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The plan does not anticipate impacts due to agricultural or forest products.

g. Proposed measures to reduce or control transportation impacts, if any:

The plan does not propose transportation impacts. Impacts due to the individual CIPs will be determined during design,

15. Public services

Find help answering public service questions[17]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The plan does not anticipate a need for increased public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

[17] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-b-environmental-elements/environmental-elements-15-public-services

The plan does not anticipate any impact to public services.

16. Utilities

Find help answering utilities questions[18]

a. **Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:**

b. **Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.**

The Plan does not propose any new utilities. CIPs consist of retrofits to existing stormwater only.

C.Signature

Find help about who should sign[19]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

X Curt Lee Iffrig

Type name of signee: Curt Lee Iffrig, PE

Position and agency/organization: Engineer, Gray and Osborne, Inc.

Date submitted: 5/15/2024

D.Supplemental sheet for nonproject actions

Find help for the nonproject actions worksheet[20]

Do not use this section for project actions.

[18] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-b-environmental-elements/environmental-elements-16-utilities

[19] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-C-Signature

[20] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-d-non-project-actions

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. **How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?**

The plan does not propose an increase in stormwater runoff.

- **Proposed measures to avoid or reduce such increases are:**

  The plans CIPs include water quality treatment BMPs such as bioswales to improve water quality.

2. **How would the proposal be likely to affect plants, animals, fish, or marine life?**

The plan does not anticipate any impacts to plant or animal life.

- **Proposed measures to protect or conserve plants, animals, fish, or marine life are:**

  The plan proposes maintenance and CIPs including stormwater retrofits with water quality improvements in mind. Water Quality improvements will improve the quality of life for plant and animal life.

3. **How would the proposal be likely to deplete energy or natural resources?**

The plan does not propose impacts to energy or natural resources.

- **Proposed measures to protect or conserve energy and natural resources are:**

  The plan does not propose impacts to energy or natural resources.

4. **How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection, such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?**

The plan does not propose impacts to these sensitive areas.

- **Proposed measures to protect such resources or to avoid or reduce impacts are:**

The plan does not propose impacts to these sensitive areas.

5. **How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?**

The plan does not propose impacts to shoreline.

- **Proposed measures to avoid or reduce shoreline and land use impacts are:**

  The plan does not propose impacts to shoreline.

6. **How would the proposal be likely to increase demands on transportation or public services and utilities?**

The plan does not anticipate an increase demand on transportation.

- **Proposed measures to reduce or respond to such demand(s) are:**

The plan does not anticipate an increase demand on transportation.

7. **Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.**

None known