Attachment 17
Public Services and Utilities Discipline Report

CAPITOL LAKE – DESCHUTES ESTUARY

Long-Term Management Project Environmental Impact Statement

Public Services & Utilities Discipline Report

Prepared for:

Washington State Department of Enterprise Services

1500 Jefferson Street SE
Olympia, WA 98501

Prepared by:

Environmental Science Associates (ESA)

June 2021

< Intentionally Blank >

Executive Summary

This Public Services and Utilities Discipline Report describes the potential impacts of the Capitol Lake – Deschutes Estuary Long-Term Management Project on public services and utilities. The Capitol Lake – Deschutes Estuary includes the 260-acre Capitol Lake Basin, located on the Washington State Capitol Campus, in Olympia, Washington. Long-term management strategies and actions are needed to address issues in the Capitol Lake – Deschutes Estuary project area. An Environmental Impact Statement (EIS) is being prepared to document the potential environmental impacts of various alternatives and determine how these alternatives meet the long-term management objectives identified for the watershed.

The study area for the public services and utilities analysis includes the project area and adjacent areas where water, stormwater, and wastewater infrastructure as well as local utility providers (electricity, natural gas, telecommunications) and emergency service providers could be affected by construction or operation of the project.

Potential impacts were determined by considering whether project activities could temporarily interrupt utility service during relocation or replacement, or as a result of accidental disruption, or create longer response times for emergency response and other public services on a temporary, permanent, or long-term basis. This discipline report also addresses how project alternatives could change how relative sea-level rise (RSLR) affects public services and utilities in the study area. Sea-level rise projections were incorporated into the hydrologic modeling and assumed as part of future conditions (see the *Hydrodynamics and Sediment Transport Discipline Report* [Moffatt & Nichol 2021] for further information).

The analysis examines the No Action Alternative, as well as three action alternatives (Managed Lake, Estuary, and Hybrid).

Short-term (Construction) Impacts

The No Action Alternative would not result in construction impacts on public services and utilities because the project would not be built.

Under all action alternatives, truck trips from project construction of common elements (initial dredging, habitat area creation, and construction of a new 5th Avenue pedestrian bridge, boardwalks, dock and boat launch), could result in nominal increases in both response times for emergency service providers, and travel times for other services (e.g., solid waste collection, postal services, and school busses). With implementation of traffic control plans and proper notifications, potential impacts on response times and existing services associated with these elements would be **less-than-significant**. The Estuary and Hybrid Alternatives would also result in the closure of the 5th Avenue Bridge for an extended duration during removal and reconstruction of the bridge. Response times and access for public services and utility providers may be temporarily affected by detours during this time. Emergency response times for emergency vehicles that would need to respond through the area would likely be increased for an estimated 5.5 years, and would potentially be a **significant impact** given the extended duration. For the Managed Lake Alternative, if closure of the 5th Avenue Bridge is needed during some or all of the period jet grouting occurs, and a temporary connection between 4th Avenue and Deschutes Parkway is not constructed, all detoured vehicles would be required to use routes around the south end of the Middle Basin. While this would likely increase response times for emergency vehicles through this east-west corridor during peak times of day, impacts would be **less-than-significant** given the short-term duration of closure (7 weeks).

Under all action alternatives, accidental damage to utility lines during project construction could temporarily disrupt utility services. With implementation of measures to locate and confirm utility locations and to coordinate final construction plans with affected utilities, the potential impact on utilities would be **less-than-significant**. The Estuary and Hybrid Alternatives would require the relocation of major utility lines to facilitate removal and replacement of the 5th Avenue Bridge. Service disruptions are expected to be minimal as utility lines would be relocated prior to removal of the bridge. Both alternatives would also require stormwater outfall replacement along Deschutes Parkway SW and along the Arc of Statehood. With measures to minimize utility disruptions, impacts would be **less-than-significant.**

Long-term (Operational) Impacts

Both the No Action Alternative and the Managed Lake Alternative retain the Capitol Lake Basin in its current configuration, although the Managed Lake Alternative would include additional management actions. Through modeling conducted to support water quality improvement planning in the Deschutes River watershed, the Washington State Department of Ecology (Ecology) has identified Capitol Lake as the largest of four sources contributing to nutrient loading in Budd Inlet. According to a technical report released by Ecology, Lacey, Olympia, Tumwater, and Thurston County (LOTT) and other sources of nutrient pollution within the Capitol Lake Basin, including stormwater dischargers, would need to further reduce their nutrient loading (through improved water treatment or other approaches) to improve water quality in Budd Inlet to meet numerical water quality standards. The issue of allocations is complicated, and there is some uncertainty as to how Ecology would assign allocations in the future. However, if LOTT and stormwater dischargers were required to undertake additional measures as a result of Capitol Lake not meeting its future load allocations, the most stringent targets would be expected under the No Action and Managed Lake Alternatives, and this would be a **significant impact.**

Under all action alternatives (Managed Lake, Estuary, and Hybrid), additional visitors could be attracted to the area as a result of enhanced recreational facilities and opportunities. Any increase in the demand for emergency response services as a result of increased use would be relatively minor, and impacts would be **less-than-significant.**

All action alternatives would also include recurring maintenance dredging. None of these activities are anticipated to result in damage to utilities or service interruptions. Recurring maintenance dredging could require the use of temporary power, such as onsite generators or use of existing electricity. Decontamination stations would also require the extension of buried electric lines and water lines to the station locations, but would require only minor amounts of electricity and water to operate. Under the Managed Lake Alternative, electricity required to power the dam would remain at existing levels. As a result, **no impacts** on utilities are anticipated.

Under the Estuary and Hybrid Alternatives, long-term impacts would primarily be associated with reestablishing tidal hydrology to the Capitol Lake Basin. Reestablishing tidal hydrology to the basin would introduce saltwater into locations where existing utility infrastructure is vulnerable to saline conditions. Corrosion of metal utility lines and surfaces is a risk when these objects encounter saltwater. Potentially vulnerable utilities include suspended utilities on the Olympia & Belmore Railroad, Inc. (OYLO) railroad crossing and buried ductile iron utility lines present in the area, including under Marathon Park. If exposed to groundwater with low levels of salinity, the life expectancy of the lines could be reduced. Design measures are included to replace existing metal outfalls; however, these other low-lying utility lines would remain vulnerable. Given the potential for damage, impacts are considered **significant.** With mitigation measures to monitor utility lines for corrosion and replace the lines if corrosion starts to become considerable, impacts from saltwater exposure could be reduced to **less-than-significant** levels.

Based on hydrologic modeling, overland flooding of low-lying areas around the Capitol Lake Basin would occur under all alternatives, presenting a potential risk to utilities. Under the No Action and Managed Lake Alternatives, overland flooding is driven by extreme river flood events, whereas overland flooding under the Estuary and Hybrid Alternatives is driven by extreme tides and sea level rise. The majority of utilities that may be affected by overland flooding (from extreme river flood conditions and/or extreme tides/RSLR) are on the eastern shore of the North Basin, in the vicinity of Heritage Park and Powerhouse Road. The highest maximum water levels would be expected to occur under the No Action and Managed Lake Alternatives, during extreme river flood events. Maximum water levels for the Managed Lake Alternative would be slightly (≤1 foot) higher than that of the No Action Alternative. Consequently, there would be a slightly greater extent of overland flooding under the Managed Lake Alternative. Under the Estuary and Hybrid Alternatives, water levels within the Capitol Lake Basin would no longer be controlled by the 5th Avenue Dam/tide gate and would rise and fall with the tides. Maximum water levels for the Estuary and Hybrid Alternatives would be slightly (≤1 foot) lower than that of the No Action and Managed Lake Alternatives.

The project does not include actions to address sea level rise in downtown Olympia. However, the City of Olympia, LOTT, and Port of Olympia have outlined measures that would be implemented at

different sea level rise projections as part of the Olympia Sea Level Rise Response Plan (LOTT et al. 2019). The project alternatives are generally compatible with and do not conflict with any of the proposed design measures. Those measures could be implemented by those entities as part of any alternative. However, overland flooding from Capitol Lake Basin for the extreme river flood event under the No Action and Managed Lake Alternatives results in water surface elevations in the downtown area that exceed the flood-proofing elevations set in the Olympia Sea Level Response Plan. As a result, there could be **significant** impacts on stormwater and other utilities that could be affected during extreme river flood events under the No Action and Managed Lake Alternatives. Under the Estuary and Hybrid Alternatives, the modeled flood elevations predicted in the Heritage Park area would be mitigated by the improvements planned under the Olympia Sea Level Rise Response Plan as currently designed. In addition, the reduced extent of overland flooding under the Estuary and Hybrid Alternatives compared to the No Action Alternative is expected to have a **minor beneficial effect** on utilities.

Construction and operational impacts of the No Action and action alternatives are summarized in Tables ES.1 and ES.2.

Table ES.1 Summary of Construction Impacts and Mitigation Measures

	Impact Finding	Minimization and Other Mitigation Measures	Significant and Unavoidable Adverse Impact
Managed Lake Alternative			
Public Services – Increased response times / travel times for emergency response and public service providers during construction of common elements (e.g., dredging)	Less-than-significant	BMPs and other measures to minimize impacts are included in Section 5.7.1.1.	No
Public Services – Increased response times / travel time for emergency response and public service providers during construction of 5th Avenue Dam overhaul repairs (if closure required)	Less-than-significant	In addition to implementation of a CTMP and other measures described in the *Transportation Discipline Report*: • Prior to construction, consult with local police, fire, and emergency response providers to develop and implement emergency response plans, establish emergency vehicle routes, and ensure that general emergency management services are not compromised.	No

	Impact Finding	Minimization and Other Mitigation Measures	Significant and Unavoidable Adverse Impact
Utilities – Utility disruptions	Less-than-significant	BMPs and other measures to minimize impacts are included in Section 5.7.1.1.	No
Estuary Alternative			
Public Services – Increased response times / travel times for emergency response and public service providers during construction of common elements (e.g., dredging)	Less-than-significant	BMPs and other measures to minimize impacts are included in Section 5.7.1.1.	No
Public Services – Increased response times / travel times for emergency response and public service providers during extended 5th Avenue Bridge detour	**Significant** (reduced to less-than-significant with proposed mitigation)	In addition to implementation of a CTMP and other measures described in the *Transportation Discipline Report*: • Prior to construction, consult with local police, fire, and emergency response providers to develop and implement emergency response plans, establish emergency vehicle routes, and ensure that general emergency management services are not compromised.	No
Utilities – Utility disruptions	Less-than-significant	BMPs and other measures to minimize impacts are included in Section 5.7.1.1.	No
Hybrid Alternative			
Public Services – Increased response times / travel times for emergency response and public service providers during construction of common elements (e.g., dredging)	Less-than-significant	BMPs and other measures to minimize impacts are included in Section 5.7.1.1.	No

	Impact Finding	Minimization and Other Mitigation Measures	Significant and Unavoidable Adverse Impact
Public Services – Increased response times / travel times for emergency response and public service providers during extended 5th Avenue Bridge detour	**Significant** (reduced to less-than-significant with proposed mitigation)	Same as Estuary Alternative	No
Utilities – Utility disruptions	Less-than-significant	BMPs and other measures to minimize impacts are included in Section 5.7.1.1.	No

BMPs = best management practices; CTMP = Construction Traffic Management Plan.

Table ES.2 Summary of Operational Impacts (including Benefits) and Mitigation Measures

Impact	Impact Finding	Minimization and other Mitigation Measures	Significant and Unavoidable Adverse Impact
No Action Alternative			
Public Services – Increase in demand for emergency response services	No impact	N/A	N/A
Utilities – Impacts on LOTT and other dischargers if required to undertake additional nutrient source reduction measures	**Significant**	N/A. Mitigation for the adverse impacts of the No Action Alternative would require large-scale efforts similar to the action alternatives; therefore, no specific measures are listed for this alternative.	N/A
Utilities – Impacts on low-lying utilities that could be physically affected during extreme river flood events	**Significant**	N/A	N/A

Impact	Impact Finding	Minimization and other Mitigation Measures	Significant and Unavoidable Adverse Impact
Managed Lake Alternative			
Public Services – Increase in the demand for emergency response services	Less-than-significant	None	No
Utilities – Impacts on low lying utilities that could be physically affected during extreme river flood events	**Significant** (reduced to less-than-significant with mitigation)	Measures to minimize impacts are included in Section 5.7.2.2. In addition: • Coordinate with the City of Olympia to assist the City with updated design parameters for the floodproofing design of the Heritage Park berm in consideration of hydrologic modeling completed for this project.	No
Utilities – Impacts on LOTT and other dischargers if required to undertake additional nutrient source reduction measures	**Significant**	None identified	**Yes**
Estuary Alternative			
Public Services – Increase in the demand for emergency response services	Less-than-significant	None	No

Impact	Impact Finding	Minimization and other Mitigation Measures	Significant and Unavoidable Adverse Impact
Utilities – Potential impacts on low-lying utilities from saltwater exposure	**Significant** (reduced to less-than-significant with mitigation)	Measures to minimize impacts are included in Section 5.7.2.2. In addition: • During design, complete an evaluation of utilities potentially vulnerable to seawater corrosion under future conditions, and coordinate with public and private utility owners in developing a monitoring, protection, or replacement schedule.	No
Utilities – Reduced extent of overland flooding compared to No Action	Minor Beneficial Effect		
Hybrid Alternative			
Public Services – Increase in the demand for emergency response services	Less-than-significant	None	No
Utilities – Potential impacts on low-lying utilities from saltwater exposure	**Significant** (reduced to less-than-significant with mitigation)	Same as Estuary Alternative	No
Utilities – Reduced extent of overland flooding compared to No Action	Minor Beneficial Effect		

Table of Contents

Exhibits

Tables

Figures

List of Acronyms and Abbreviations

Acronyms/ Abbreviations	Definition
BITP	Budd Inlet Treatment Plant
BPS	booster pump station
CIP	Capital Improvement Plan
CMP	corrugated metal pipe
CTMP	Construction Traffic Management Plan
EIS	Environmental Impact Statement
Enterprise Services	Washington State Department of Enterprise Services
GIS	geographic information system
HDPE	high-density polyethylene
I-5	Interstate 5
LED	light-emitting diode
LOS	level of service
LOTT	Lacey, Olympia, Tumwater, and Thurston County
NAVD88	North American Vertical Datum 1988
OYLO	Olympia & Belmore Railroad, Inc.
PSE	Puget Sound Energy
RCW	Revised Code of Washington
RSLR	relative sea-level rise
SLR	sea-level rise
TMDL	Total Maximum Daily Load
WSDOT	Washington State Department of Transportation
WWTP	wastewater treatment plant

1.0 Introduction and Project Description

1.1 PROJECT DESCRIPTION

The Capitol Lake – Deschutes Estuary includes the 260-acre Capitol Lake Basin, located on the Washington State Capitol Campus, in Olympia, Washington. The waterbody has long been a valued community amenity. Capitol Lake was formed in 1951 following construction of a dam and provided an important recreational resource. Historically, the Deschutes Estuary was used by local tribes for subsistence and ceremonial purposes. Today, the expansive waterbody is closed to active public use. There are a number of environmental issues including the presence of invasive species, exceedances of water quality (WQ) standards, and inadequate sediment management.

The Washington State Department of Enterprise Services (Enterprise Services) is responsible for the stewardship, preservation, operation, and maintenance of the Capitol Lake Basin. The 260-acre Capitol Lake Basin is maintained by Enterprise Services under long-term lease agreement from the Washington Department of Natural Resources.

In 2016, as part of Phase 1 of long-term planning, a diverse group of stakeholders, in collaboration with the state, identified shared goals for long-term management and agreed an Environmental Impact Statement (EIS) was needed to evaluate a range of alternatives and identify a preferred alternative. In 2018, the state began the EIS process. The EIS evaluates four alternatives, including a Managed Lake, Estuary, Hybrid, and a No Action Alternative.

The long-term management alternatives are evaluated against the shared project goals of: improving water quality; managing sediment accumulation and future deposition; improving ecological functions; and enhancing community use of the resource. Refer to Figure 1.1 for the project area for long-term management. The Final EIS will identify a preferred environmentally and economically sustainable long-term management alternative for the Capitol Lake – Deschutes Estuary.

The EIS process maintains engagement with the existing Work Groups, which include the local governments, resource agencies, and tribe. It also provides for expanded engagement opportunities for the public, such as a community sounding board.

Figure 1.1 Project Area

1.2 SUMMARY OF PROJECT ALTERNATIVES

1.2.1 Managed Lake Alternative

The Managed Lake Alternative would retain the 5th Avenue Dam in its existing configuration. The 5th Avenue Dam would be overhauled to significantly extend the serviceable life of the structure. The reflecting pool within the North Basin would be maintained, and active recreational use would be restored in this area. Sediment would be managed through initial construction dredging and recurring maintenance dredging in the North Basin only. Sediment from construction dredging would be used to create habitat areas in the Middle Basin to support improved ecological function, habitat complexity, and diversity. Sediment would continue to accumulate and over time would promote a transition to freshwater wetlands in the South and Middle Basins. Boardwalks, a 5th Avenue Pedestrian Bridge, a dock, and a boat launch would be constructed for community use.

If selected as the Preferred Alternative, adaptive management plans would be developed to maintain water quality, improve ecological functions, and manage invasive species during the design and permitting process.

1.2.2 Estuary Alternative

Under the Estuary Alternative, the 5th Avenue Dam would be removed, and an approximately 500-foot-wide (150-meter-wide) opening would be established in its place. This would reintroduce tidal hydrology to the Capitol Lake Basin, returning the area to estuarine conditions where saltwater from Budd Inlet would mix with freshwater from the Deschutes River. Sediment would be managed through initial construction dredging in the Capitol Lake Basin and recurring maintenance dredging within West Bay. Dredged materials from construction dredging would be used to create habitat areas in the Middle and North Basins to promote ecological diversity, though tideflats would be the predominant habitat type. Boardwalks, a 5th Avenue Pedestrian Bridge, a dock, and a boat launch would be constructed for community use. This alternative also includes stabilization along the entire length of Deschutes Parkway to avoid undercutting or destabilization from the tidal flow. Existing utilities and other infrastructure would be upgraded and/or protected from reintroduced tidal hydrology and saltwater conditions.

If selected as the Preferred Alternative, adaptive management plans would be developed to improve ecological functions and manage invasive species during the design and permitting process.

1.2.3 Hybrid Alternative

Under the Hybrid Alternative, the 5th Avenue Dam would be removed, and an approximately 500-foot-wide (150-meter-wide) opening would be established in its place. Tidal hydrology would be reintroduced to the western portion of the North Basin and to the Middle and South Basins. Within the North Basin, a curved and approximately 2,600-foot-long (790-meter-long) barrier wall with a walkway would be constructed to create an approximately 45-acre saltwater reflecting pool adjacent to Heritage Park. A freshwater (groundwater-fed) reflecting pool was also evaluated for this EIS. Construction and

maintenance of this smaller reflecting pool, in addition to restored estuarine conditions in part of the Capitol Lake Basin, gives this alternative its classification as a hybrid. Sediment would be managed through initial construction dredging in the Capitol Lake Basin and recurring maintenance dredging within West Bay. In the Middle and North Basins, constructed habitat areas would promote ecological diversity, though tideflats would be the predominant habitat type. Boardwalks, a 5th Avenue Pedestrian Bridge, a dock, and a boat launch would be constructed for community use. This alternative also includes stabilization along the entire length of Deschutes Parkway to avoid scour or destabilization. Existing utilities and other infrastructure would be upgraded and/or protected from reintroduced tidal hydrology and saltwater conditions.

If selected as the Preferred Alternative, adaptive management plans would be developed before operation of the alternative to improve ecological functions and manage invasive species during the design and permitting process. Adaptive management would also be needed for a freshwater reflecting pool, but not for a saltwater reflecting pool.

1.2.4 No Action Alternative

The No Action Alternative represents the most likely future expected in the absence of implementing a long-term management project. The No Action Alternative would persist if a Preferred Alternative is not identified and/or if funding is not acquired to implement the Preferred Alternative. A No Action Alternative is a required element in a SEPA EIS and provides a baseline against which the impacts of the action alternatives (Managed Lake, Estuary, Hybrid) can be evaluated and compared.

The No Action Alternative would retain the 5th Avenue Dam in its current configuration, with limited repair and maintenance activities, consistent with the scope and scale of those that have received funding and environmental approvals over the past 30 years. In the last 30 years, the repair and maintenance activities have been limited to emergency or high-priority actions, which occur sporadically as a result of need and funding appropriations.

Although Enterprise Services would not implement a long-term management project, current management activities and ongoing projects in the Capitol Lake Basin would continue. Enterprise Services would continue to implement limited nuisance and invasive species management strategies.

In the absence of a long-term management project, it is unlikely that Enterprise Services would be able to procure funding and approvals to manage sediment, improve water quality, improve ecological functions, or enhance community use. The No Action Alternative does not achieve the project goals.

1.3 CONSTRUCTION METHODS FOR THE ACTION ALTERNATIVES

This impact analysis relies on the construction method and anticipated duration for the action alternatives, which are described in detail in Chapter 2 of the EIS.

2.0 Regulatory Context

2.1 RESOURCE DESCRIPTION

The public services and utilities considered in this analysis include: (1) fire and emergency response services; (2) water, stormwater, and sewer utilities; and (3) electricity, natural gas, and telecommunications. The following section describes the regulatory context of the project alternatives on public services and utilities.

2.2 RELEVANT LAWS, PLANS, AND POLICIES

Public services and utilities within the study area are protected or regulated by a variety of state laws, plans, and policies (Section 2.2.1) and local plans and policies (Section 2.2.2). There are no applicable federal laws, plans, and policies that regulate public services and utilities.

2.2.1 State

State laws that address the development of public services and utilities in Washington State are listed and described in Table 2.1.

Table 2.1 State Laws, Plans, and Policies

Regulatory Program or Policies	Lead Agency	Description
Title 80 Revised Code of Washington: Public Utilities		Compilation of Washington State laws that are applicable to public utilities.
Washington State Enhanced Hazard Mitigation Plan 2018	Washington Emergency Management Division	Identifies and profiles common hazards, risks, and vulnerabilities in Washington, and proposes strategies to reduce risks (Washington Emergency Management Division 2018).

2.2.2 Local

The municipalities of Olympia and Tumwater have developed comprehensive plans and codified ordinances to provide a framework for the development and management of public services and utilities within their jurisdictions. The City of Olympia; Lacey, Olympia, Tumwater, and Thurston County (LOTT) Clean Water Alliance; and the Port of Olympia have developed a Sea Level Rise Response Plan for downtown Olympia, that in part, addresses adaptation measures needed to protect utility infrastructure from sea-level rise (LOTT et al. 2019). Additionally, Thurston County, Olympia, and Tumwater have developed emergency management plans to address emergency events such as floods, fire and other natural disasters within their jurisdictions. Local laws, plans, and policies are listed and described in Table 2.2.

Table 2.2 Local Laws, Plans, and Policies

Regulatory Program or Policies	Lead Agency	Description
Thurston County Comprehensive Emergency Management Plan	Thurston County	"The purpose of this Plan is to guide County government behavior before, during and after a disaster. It develops and describes a comprehensive program that defines who does what, when, where and how in order to mitigate, prepare for, respond to and recover from the effects of natural, technological and human-caused hazards" (Thurston County 2015).
Olympia Comprehensive Plan 2014; Tumwater Comprehensive Plan 2016	City of Olympia, City of Tumwater	Provide information regarding future land uses and the policy framework for development related to public utilities and management of public services (City of Olympia 2014, City of Tumwater 2016).
Olympia Municipal Code Title 13 (Public Services); Thurston County Title 15 (Public Works); Tumwater Municipal Code Title 13 (Public Services)	City of Olympia, Thurston County, City of Tumwater	Provide the regulatory framework for development related to public utilities and management of public services.
City of Olympia Comprehensive Emergency Management Plan 2016	City of Olympia	Defines policies and procedures for efficient and effective emergency responses to protect property and preserve lives (City of Olympia 2016).
Olympia Sea Level Rise Response Plan	City of Olympia, Port of Olympia, and LOTT Water Quality Alliance	Sea-level rise projections for the study area, infrastructure vulnerability by neighborhood, and specific proposed adaptation actions.
City of Tumwater Comprehensive Emergency Management Plan	City of Tumwater	The mission of plan is "to take appropriate actions to mitigate, prepare for, respond to and recover from all natural and manmade disasters within its jurisdiction" (City of Tumwater 2010).

3.0 Methodology

3.1 SELECTION OF THE STUDY AREA

The project area includes the water, shorelines, open space, and industrial areas immediately adjacent to Capitol Lake, extending from Tumwater Falls through West Bay within Budd Inlet (Figure 1.1).

The study area for the public services and utilities analysis includes the project area and adjacent areas where water, stormwater, and wastewater infrastructure as well as local utility providers (electricity, natural gas, telecommunications) and emergency service providers could be affected by construction or operation of the project. The study area includes all potential staging and construction areas.

3.2 DATA SOURCES AND COLLECTION

Data and information sources used for the public services and utilities analysis include inventories of sewer and water lines, storm drains, underground gas lines, fiber-optic conduit, electrical transmission lines, and emergency services from local planning documents. The *Hydrodynamics and Sediment Transport Discipline Report* prepared by Moffatt & Nichol (2021) was also utilized.

3.3 ANALYSIS OF IMPACTS

This impacts analysis considers the potential impacts on public services and utilities from the three action alternatives and the No Action Alternative. The analysis takes into account the potential for activities to temporarily interrupt, require the replacement or relocation of utilities, or result in service disruptions. Impacts on response times of emergency services and other public services were also considered in this analysis.

3.3.1 Identification of Construction Impacts

Construction impacts analyzed included activities that could temporarily interrupt utilities and create longer response times for public services in the area. This analysis qualitatively assesses where construction impacts would have the greatest potential to impact utilities adjacent to the project area and public services in the area. Potential long-term impacts are described under *Operational Impacts*.

Factors considered for the analysis of construction effects on utilities included interruptions and temporary outages from the relocation or replacement of infrastructure or facilities that provide water, refuse services, electricity, natural gas, or telecommunications.

Factors considered for the analysis of construction effects on public services included the increased demands on emergency services, and the project's potential to alter or hinder the timely provision of emergency services or other public services during construction.

For this analysis, short-term (construction) impacts on utilities are considered less-than-significant or significant, as follows:

- **Less-than-Significant**—Impacts are considered less-than-significant if interruptions from construction on existing utilities could be addressed through temporary connections or other means and would only result in minimal effects on service.
- **Significant**—Impacts are considered significant if construction required the replacement or relocation of infrastructure or facilities for water, wastewater, stormwater, electricity, natural gas, or telecommunications that could result in long-term interruptions in service or adverse environmental effects.

For this analysis, short-term (construction) impacts on public services are considered less-than-significant or significant, as follows:

- **Less-than-Significant—** Impacts are considered less-than-significant if construction causes temporary or short-term changes in response times or requires response from public service providers with no long-term changes.
- **Significant—**Impacts are considered significant if construction creates a demand for public services that substantially exceeds the capacity of public service agencies (by increasing response times or requiring large increases in staff).

3.3.2 Identification of Operational Impacts

Operational impacts analyzed include activities that could create permanent or long-term interruptions to utilities and create longer response times for public services in the area. This analysis qualitatively assesses where operational impacts would have the greatest potential to impact utilities adjacent to the project and public services in the area. This discipline report also addresses how project alternatives could change how relative sea-level rise (RSLR) and climate change affect public services and utilities in the study area. Sea-level rise and river flood projections were incorporated into the hydrologic modeling and assumed as part of future conditions (see the *Hydrodynamics and Sediment Transport Discipline Report* [Moffatt & Nichol 2021] for further information).

Factors considered for the analysis of operational effects are the same as those described under construction impacts.

For this analysis, long-term (operational) impacts on utilities are considered less-than-significant or significant, as follows:

- **Less-than-Significant—**Impacts are considered less-than-significant if the project would not result in service interruptions, or impacts could be addressed through temporary connections or other means and would only result in minimal effects on service.
- **Significant—** Impacts are considered significant if the project has the potential to damage existing utilities, interrupt utility service, or modify access to existing utilities creating permanent or long-term interruptions to services.

For this analysis, long-term (operational) impacts on public services are considered less-than-significant or significant, as follows:

- **Less-than-Significant—**Impacts are considered less-than-significant if demand on public services remained similar to the current demand or within the service capacity of the existing area.
- **Significant—** Impacts are considered significant if the project would create a demand for public services that substantially exceeds the capacity of public service agencies (by increasing response times or requiring large increases in staff).

The analysis also considered the potential for beneficial effects, primarily related to the decreased risk of flooding to utilities. Long-term beneficial effects were considered minor, moderate, or substantial based on best professional judgement.

4.0 Affected Environment

4.1 FIRE AND EMERGENCY SERVICES

The Olympia Fire Department and Tumwater Fire Department provide emergency fire and medical services to the study area.

Most of the study area is located within Olympia Fire Districts 1 and 2, with a very small portion located within District 3 (City of Olympia Fire Department 2018). Each district is served by a fire station. The southern portion of the study area is located within the service area of the City of Tumwater Fire Department. No fire stations are located within the study area; however, multiple stations are located within 1 mile of the study area, which ensures a timely response to incidents in the area. Table 4.1 shows the average response time and total calls for each fire district.

Table 4.1 Response times and total number of calls in 2018

Fire District (City of Olympia)	Total Calls (2018)	Average Response Time
District 1	4,187	06:32 minutes
District 2	3,940	07:41 minutes
District 3	1,256	07:56 minutes
Fire Department (City of Tumwater)	**Total Calls (2018)**	**Average Response Time**
Station 1 and 2	2,811	06:45 minutes (Station 1) 05:74 minutes (Station 2)

Source: City of Olympia Fire Department 2018; C. Blakeway, personal communication, 2020.

There are no hospitals located within the study area. The nearest hospital is Capital Medical Center, approximately 1.5 miles west of the study area.

Four law enforcement agencies have jurisdictions that overlap the study area, including the Olympia Police Department, Tumwater Police Department, Thurston County Sheriff, and Washington State Patrol. All stations and other facilities are located outside of the study area. County sheriffs are

responsible for maintaining the peace within their respective counties (Revised Code of Washington [RCW] 36.28.010) and filing complaints within their jurisdictions (RCW 36.28.011). Washington State Patrol has jurisdictions over state roadways (Interstate 5 [I-5] and US Highway 101) and the Capitol Campus.

4.2 WATER, SEWER, AND STORMWATER UTILITIES

The City of Olympia has a network of wells, springs, reservoirs, pumps, and distribution lines to supply its residents with water. The primary source of water for Olympia is McAllister Springs; secondary water sources for the city are provided by six additional wells (City of Olympia 2014). Two booster pump stations (BPS) (West Bay BPS and Percival BPS) are located within the study area (City of Olympia 2014). Water lines within the study area include a potable waterline that is routed across the 5th Avenue Bridge, an 8-inch line routed along Deschutes Parkway, and a 16-inch line that is routed under Marathon Park and suspended from the pedestrian bridge adjacent to the Olympia & Belmore Railroad, Inc. (OYLO) railroad (Moffatt & Nichol 2020). The 8-inch and 16-inch water lines are both made of ductile iron (Moffatt & Nichol 2008).

According to the City of Tumwater's current *Water System Plan* (2010), the City of Tumwater water system includes 12 groundwater wells, five reservoirs in three pressure zones, three booster stations, and a pipeline distribution network (2010). The main source of water for the City of Tumwater is the Palmero Wellfield, with the Bush Wellfield providing supplemental water. Tumwater has three water zones; the study area is located in Zone 350 (City of Tumwater 2020).

The wastewater systems for both the Cities of Olympia and Tumwater include gravity pipes, pressure pipes, and pump stations. The Olympia Wastewater Utility and Tumwater Water Resources Divisions are responsible for collecting and conveying wastewater flows to regional treatment facilities operated by the LOTT Clean Water Alliance (LOTT). The Budd Inlet Treatment Plant (BITP) is LOTT's main treatment facility, processing approximately 14 million gallons of wastewater on an average day. The BITP, located between downtown Olympia and the Port of Olympia, discharges treated water through an outfall in the West Bay of Budd Inlet, and also provides reclaimed water.

After the LOTT BITP generates reclaimed water to Class A standards, the City purveys it to four Olympia customers, primarily for irrigation. LOTT also infiltrates Class A reclaimed water at its Hawks Prairie groundwater recharge facility in Lacey, outside the City limits. A LOTT reclaimed water force main is routed on the western side of the Middle Basin and around the North Basin crossing at the 5th Avenue Bridge and between the North and Middle Basins near Heritage Park. LOTT also owns and maintains a 12- to 18-inch reclaimed water distribution line that is routed along the eastern shoreline of the North Basin, crossing between the North and Middle Basins near Heritage Park along the pedestrian walkway bridge, and running along the western shoreline of the Middle Basin into Tumwater (Brown and Caldwell 2010).

Olympia's sewer gravity mains range from 6 inches to 24 inches in diameter, with most pipelines located in the outer portions of the study area. Flow from West Olympia is conveyed across the 4th Avenue Bridge via an 18-inch sewer gravity main. Once flows reach the east end of the bridge, they split

between the 18-inch main and 15-inch overflow line (City of Olympia 2019a). Two lift stations are located within the study area, one at the south end of Budd Inlet east of the 4th Avenue Bridge and the other (Percival Pump Station) near the southwestern portion of the North Basin. A LOTT sewer gravity main flows into the Percival Pump Station from the southwest (City of Olympia 2014). Other sanitary sewer infrastructure within the study area includes a 22-inch HDPE gravity line to the west of the Middle Basin, a 20- to 24-inch force main routed to the west of the North Basin and across the 5th Avenue Dam, and a 24-inch ductile iron pipe under the pedestrian bridge adjacent to the railroad trestle (Moffatt & Nichol 2008).

In the Tumwater portion of the study area, a water treatment structure is located just south of the junction between I-5 and US Highway 101, adjacent to the east side of I-5 (City of Tumwater 2018). Most of the water lines and sewer lines within the study area are made of ductile iron (Moffatt & Nichol 2008).

According to the City of Olympia's Storm and Surface Water Utility Plan (2017) and the City of Tumwater's Comprehensive Stormwater Management Plan (2018), the storm system for each city includes a system of catch basins, conveyance, and outfalls. Within the study area, there are approximately 74 corrugated metal (steel) pipe (CMP) stormwater outfall sites, of which 63 are located within the shoreline of Capitol Lake. In addition to outfalls within the Olympia and Tumwater storm systems, state-owned and privately owned outfalls discharge to the lake. Table 4.2 and Figure 4.1 display the type and location of each outfall.

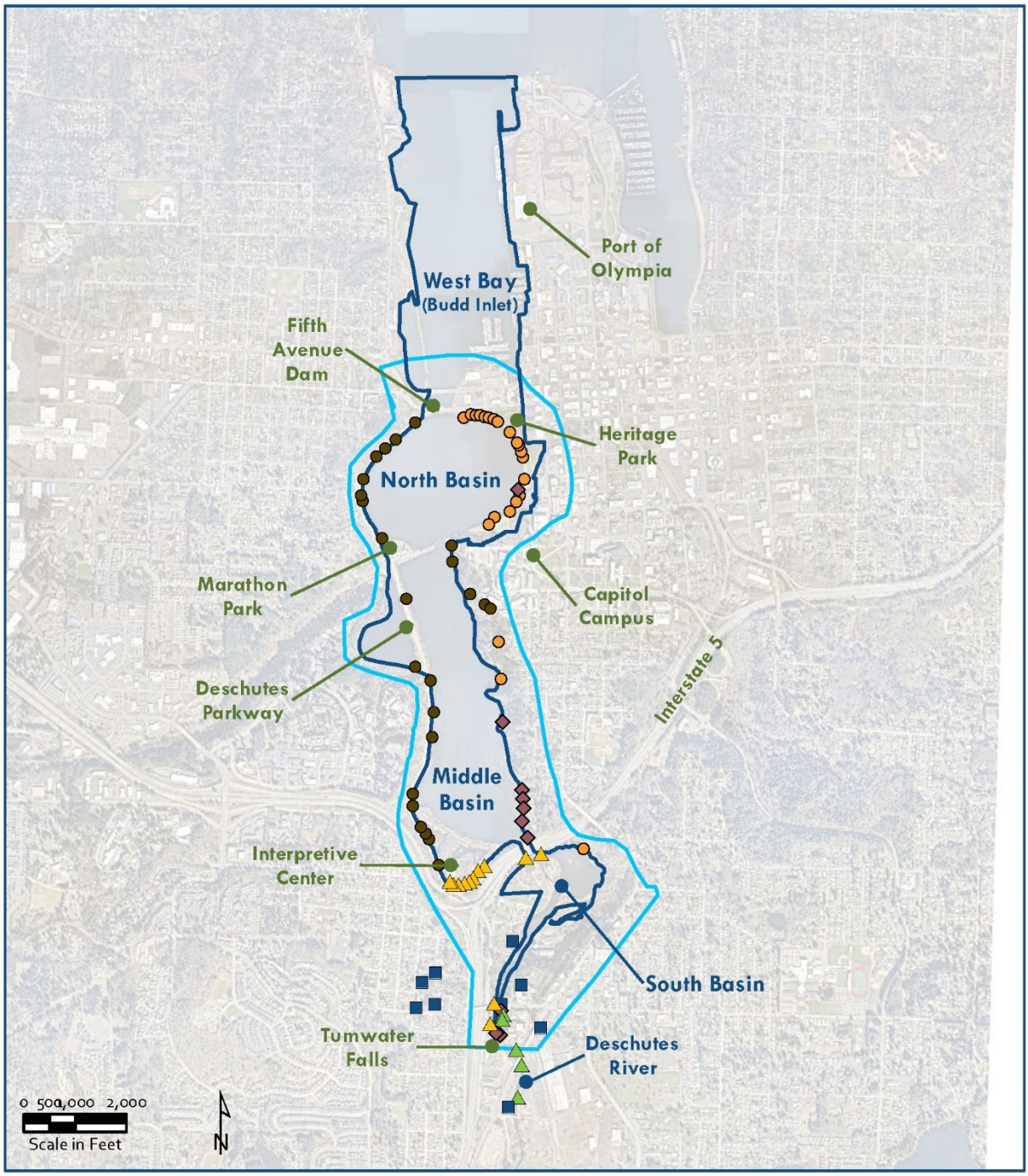
Table 4.2 Type and location of outfalls

Type of Outfall	Total	Number in North Basin	Number in Middle Basin	Number in South Basin
WSDOT Outfall Sites	12	0	8	4
Enterprise Services Outfall Sites	24	8	16	0
Olympia Outfall Sites	22	19	2	1
Brewery Outfall Sites	2	0	0	2
Tumwater Outfall Sites	4	0	0	4
Seeps or Other Outfalls	10	1	6	3

WSDOT = Washington State Department of Transportation.

Source: TRPC 2003

Figure 4.1 Capitol Lake Stormwater Outfall Locations



Increased flooding due to extreme river flows and/or sea-level rise causes operational concerns for utility infrastructure in addition to posing a physical damage and access risk. A major concern in downtown Olympia is the impact of floodwaters on stormwater infrastructure operations. Olympia has a combined sanitary sewer and stormwater system, which means that when floodwaters enter storm drains, generally the water is routed to the BITP on the East Bay of Budd Inlet. Increased groundwater elevations due to sea-level rise can also cause excess infiltration into sanitary sewer mains. Contributions of floodwater to the stormwater system impact the processing capacity of the BITP and increase the likelihood of bypassing events, where untreated or partially treated wastewater is discharged directly to Budd Inlet. The overwhelmed sanitary-stormwater system can back up sewer mains and potentially flood buildings and street drains with untreated sewage. At high levels of sea-level rise, overland flooding may directly impact onsite operations at BITP. Stormwater that is not routed to BITP and instead drains to Capitol Lake may be unable to do so when water elevations are high. This problem will become more frequent with sea-level rise.

To prevent backflow of floodwaters into the storm system, the City of Olympia is installing valves and gates in City outfalls that discharge to the Capitol Lake Basin as part of the Olympia Sea Level Response Plan to address existing flood vulnerabilities of downtown and the combined sewer system (City of Olympia 2019). Shoreline elevations along Capitol Lake are approximately 13 to 14 feet NAVD88, compared to the current 100-year flood elevation of approximately 15 feet. In the near term, flooding is managed through flood event emergency response activities, installing backflow prevention on key stormwater outfalls and pipes, and minor landscaping of low spots to lessen flood impacts. However, even with these actions, low-lying areas within and adjacent to Heritage Park will remain vulnerable to flooding during infrequent, high-discharge flood events in the Deschutes Watershed.

The Olympia Sea Level Rise Response Plan acknowledges a number of other actions that may be required in the long term to address the impacts of sea-level rise on the City's stormwater system. In the future, sea-level rise may reduce the capacity of the stormwater system to discharge street runoff, especially during combined rainfall and flood events. To address this, the number of stormwater outfalls could be reduced by rerouting stormwater pipes to fewer, consolidated outfalls along the Capitol Lake shoreline, and pumps could be installed to discharge stormwater against higher Capitol Lake water levels (City of Olympia 2019).

4.3 ELECTRICITY, NATURAL GAS, AND TELECOMMUNICATIONS

Puget Sound Energy (PSE) is the primary electricity and natural gas service provider to the cities of Olympia and Tumwater. PSE generates its electricity from a variety of sources including renewables (wind, solar, hydro, and co-generation) as well as gas, oil, and coal-fired plants (Thurston County 2019). Both electric lines and natural gas lines are located within the study area. Most of the electrical lines are located aboveground (Moffatt & Nichol 2008).

PSE power lines cross the 5th Avenue Bridge and the southeastern portion of the South Basin (City of Olympia 2014). In the 5th Avenue Bridge vicinity, east-west aligned overhead power lines cross over the 4th Avenue W bridge and the southerly end of West Bay before splitting to the northwest and

southwest, just east of the Olympic Street W and Deschutes Parkway fork. Within the study area, natural gas lines are buried and strung under the 5th Avenue Bridge.

A steam plant occupies the shoreline at the northeast edge of the Middle Basin. Known as the Powerhouse, the plant has produced steam since the 1920s serving east and west Capitol Campus with nearly 3 miles of steam and condensation piping providing steam to 12 of the 19 campus buildings. There is no functional relationship between the stream plant and Capitol Lake.

The primary provider of telecommunication services in the study area is Qwest Corporation, which does business as CenturyLink QC. A number of other private companies (e.g., AT&T, Verizon, Comcast, and Ziply) also maintain fiber optic cables and provide service throughout the area.

5.0 Impacts and Mitigation Measures

5.1 OVERVIEW

This section describes the probable impacts from the No Action Alternative and the action alternatives (Managed Lake, Estuary, and Hybrid Alternatives) on public services and utilities. This section also identifies mitigation measures that could avoid, minimize, or reduce the identified impact below the level of significance.

5.2 NO ACTION ALTERNATIVE

The No Action Alternative would not result in construction impacts on public services and utilities because the project would not be built. As a result, it would not require road closures and diversions in the project vicinity. Therefore, this alternative would not slow or stop emergency vehicles, and would have no effect on emergency-response time. The No Action Alternative would involve continuing current management practices and retaining the Capitol Lake Basin in its current configuration.

5.2.1 Impacts from Operation

5.2.1.1 Public Services

The No Action Alternative would not result in any operational impacts on public services. This alternative would not enhance recreation facilities or uses in the study area. Therefore, this alternative would not attract additional visitors to the study area. As a result, it would not increase the demand for police services and other emergency response.

5.2.1.2 Utilities

Ongoing maintenance of the 5th Avenue Dam would not require any utility replacements or relocations. There would be no impacts on existing underground or overhead utilities as no relocations would be required.

LOTT Clean Water Alliance outlines its response to changing conditions that result from regulatory planning efforts, such as the Deschutes River/Capitol Lake/Budd Inlet Total Maximum Daily Load (TMDL) study through their long-range Capital Improvement Plan (CIP) (LOTT 2020). Operational impacts from the No Action Alternative could include the potential for increased costs for LOTT and stormwater dischargers, if required by Ecology to meet water quality standards in Budd Inlet. Ecology's Capitol Lake/Budd Inlet TMDL study identified Capitol Lake as the largest of four man-made or anthropogenic sources contributing to nutrient loading in Budd Inlet; other sources identified included wastewater treatment plants (WWTP) that discharge in Puget Sound north of Budd Inlet, as well as WWTPs that discharge directly to Budd Inlet, such as LOTT, and other non-point pollution sources (Ecology 2012). Ecology completed additional modeling using the model from Ecology 2012 in order to evaluate different management scenarios. The model predicted "widespread and continuous depletion" of dissolved oxygen (DO) throughout Inner Budd Inlet due to the existing dam. This depletion of DO caused by the dam was attributed to a combination of factors (Ecology 2015). See Section 4.1.4.2 of the *Water Quality Discipline Report* for additional information.

Ecology is expected to issue load allocations to Capitol Lake if it remains a lake to improve the water quality and reduce nutrient loading in Budd Inlet as part of a future Capitol Lake/Budd Inlet TMDL. Other pollution sources are expected to have their waste load allocations adjusted to meet the remaining capacity that would be needed to achieve water quality standards. If Capitol Lake does not meet its future load allocations, LOTT and other nutrient sources within the Capitol Lake Basin, including stormwater dischargers, are expected to be required to improve water quality of their discharge through increased treatment and/or to reduce their discharges during the critical summer months. Increased nutrient removal and/or diversion of treated water would increase the costs for treatment of wastewater and stormwater discharges, which would be passed on to ratepayers. The issue of allocations is complicated, and there is some uncertainty as to how Ecology would assign allocations in the future. However, if LOTT and stormwater dischargers were required to undertake additional measures as a result of Capitol Lake not meeting its future load allocations, the most stringent targets would be expected under the No Action Alternative because substantive improvements in water quality could not be expected in the absence of any long-term water quality management plan. This could result in LOTT and other dischargers being required to increase treatment effectiveness, beyond the current high levels of treatment. Increased nutrient removal and/or diversion of treated water would increase the costs for treatment of wastewater and stormwater discharges, which would be passed on to ratepayers, which would be a **significant impact.**

Utilities can be physically and/or operationally affected by overland flooding. Flooding in the Capitol Lake Basin and surrounding areas occurs through two main routes: (1) overland flooding from Budd Inlet into downtown Olympia, and (2) overland flooding from the Capitol Lake Basin. The extent of downtown flooding from Budd Inlet is not affected by the project alternatives. However, the extent of overland flooding from Capitol Lake Basin is affected by the project alternatives and can be a result of extreme river flood events or extreme tidal flooding events with RSLR.

Under the No Action Alternative, the model results show that there would be continued and increased extreme river flooding, placing utilities at continued and potentially increasing risk. This flooding would

occur in low-lying areas along the entire perimeter of the Capitol Lake Basin. However, the majority of utilities that may be affected by overland flooding are on the eastern shore of the North Basin, in the vicinity of Heritage Park and Powerhouse Road. Overland flooding from Capitol Lake Basin for the modeled, representative extreme river flood event (and with 2 feet RSLR) results in water surface elevations in the downtown area of up to 17.4 NAVD88 (Table 5.1). This elevation exceeds the flood-proofing elevations set in the Olympia Sea Level Response Plan [preliminary design for the Heritage Park redesign (17.0 feet)].

Table 5.1 Summary of Hydrodynamic Model Results for No Action Alternative – Water Levels under Representative Extreme River Flooding[1] and 100-year Tide (with 2 feet of RSLR)[2]

Flood Event	Location	No Action Alternative
Event #1 - Extreme River Flood Event (with RSLR)	Max. Level in Capitol Lake Basin	+21.0
	Max. Level at Heritage Park (North Basin)	+17.4
Event #2 - 100-year Tide (with RSLR)	Max. Level in Capitol Lake Basin	+16
	Max. Level at Heritage Park (North Basin)	+10.8

Source: Hydrodynamics and Sediment Transport Discipline Report (Moffatt & Nichol 2021)

1. A +100-yr Deschutes River flow combined with a 1-yr tide (with 2-ft RSLR). To represent a more conservative scenario (and capture possible increase in extreme flow events resulting from climate change), a 100-yr (15-min average) discharge of 341 m^3/s was used as a constant inflow value at the Deschutes River boundary and a 100-yr discharge of 15 m^3/s calculated from the Deschutes River boundary with a scaling factor applied at the Percival Creek boundary as a constant inflow value.
2. A 1-yr Deschutes River flow combined with a 100-yr tide (with 2-ft RSLR).

As described in Section 4.2, a major concern in downtown Olympia is the impact of floodwaters on stormwater infrastructure operations. Contributions of floodwater to the stormwater system reduce the processing capacity of the BITP and increase the likelihood of bypassing events, where untreated or partially treated wastewater is discharged directly to Budd Inlet. Additionally, stormwater that is not routed to BITP and instead drains to Capitol Lake may be unable to do so when water elevations are high. This problem is expected to become more frequent with future extreme river flood events under the No Action Alternative.

As described in Section 4.2, in the near term, the City of Olympia manages stormwater system impacts through flood event emergency response activities, installing backflow prevention on key stormwater outfalls and pipes, and minor landscaping of low spots to reduce flood impacts. Even with these actions, however, low-lying areas within and adjacent to Heritage Park will remain vulnerable to flooding during infrequent, high-discharge flood events. This flooding could affect stormwater

infrastructure and could result in the need for increased capacity or more active management of increasing peak flows entering the BITP.

The City of Olympia, LOTT, and Port of Olympia have outlined measures that would be implemented at different sea level rise projections as part of the Olympia Sea Level Rise Response Plan. However, overland flooding from Capitol Lake Basin for the extreme river flood event under the No Action Alternative results in water surface elevations in the downtown area that exceed the flood-proofing elevations set in the Olympia Sea Level Response Plan. As a result, there could be **significant impacts** on stormwater and other utilities that could be affected during extreme river flood events under the No Action Alternative.

5.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

All action alternatives – Managed Lake, Estuary, and Hybrid – have construction impacts associated with the following:

- Initial dredging and habitat area creation
- Construction of pedestrian facilities, dock, and boat launch
- Construction staging and access

5.3.1 Impacts from Construction

5.3.1.1 Public Services

During the construction of common elements, public services would be affected by a nominal increase in traffic congestion and delays on the primary roads affected by construction and on roads around the construction area. Ongoing construction activities over a period of 4 to 8 years, depending on the action alternative, could result in temporary lane closures, increased truck traffic, and other roadway effects.

As described in the *Transportation Discipline Report*, the contractor(s) would prepare and implement a Construction Traffic Management Plan (CTMP) and Traffic Control Plan for construction activities that may affect road right-of-way. Measures typically used in traffic control plans include advertising of planned lane closures, warning signage, a flag person to direct traffic flows when needed, and methods to ensure continued access by emergency vehicles. Other mitigation measures include notifying local emergency response departments of construction. These measures would help to minimize any potential impacts on emergency response times and existing service. With these measures, impacts on emergency response during the construction of common elements would be **less-than-significant**.

5.3.1.2 Utilities

All action alternatives would require the temporary use of power during construction to power construction trailers and equipment. Construction crews would likely use onsite generators or existing

electricity infrastructure provided by PSE. This would be unlikely to result in interruptions in service and would not affect any other existing utilities.

Although no public utilities have been identified within the areas of the Capitol Lake Basin proposed for initial dredging, habitat area establishment, and boardwalk/dock/launch construction, a number of utilities cross the project area or are adjacent to construction sites. Streets, roads, and bridges in the project area serve as utility corridors. As much as possible, piers associated with the new 5th Avenue pedestrian bridge would be located to avoid conflicting with underground utilities. Overhead utility poles and lines could be susceptible to accidental damage from the movement of large construction equipment and vehicles throughout the project area. Accidental damage to utility lines during project construction could temporarily disrupt utility services. The construction contractor(s) would be required to: confirm the location of existing utilities and mark the confirmed locations accurately on the final construction drawings; work with utility service providers to minimize the risk of damage to existing utility lines and ensure prompt reconnection of service in the event of a service disruption; and take special precautions when working near high-risk utility lines, including tailgate meetings with contractor staff on days when work will occur near high-risk (high-priority) utilities.

With implementation of measures to locate and confirm utility locations and to coordinate final construction plans with the affected utilities, impacts on utilities would be **less-than-significant**.

5.4 MANAGED LAKE ALTERNATIVE

5.4.1 Impacts from Construction

5.4.1.1 Public Services

Construction impacts of the Managed Lake Alternative on emergency response times would generally be the same as described in Section 5.3.1, but would also include impacts related to the potential closure of the 5th Avenue Bridge for a short period of time. If closure of the 5th Avenue Bridge is needed during some or all of the period jet grouting, and a temporary connection between 4th Avenue and Deschutes Parkway is not constructed, all detoured vehicles would be required to use routes around the south end of the Middle Basin. Based on fire station locations in downtown Olympia relative to their district area (Fire District 1) and West Olympia (Fire District 2), service calls within those districts typically do not require an east–west crossing. However, during multiple or large-scale events, any fire district can respond, which could require travelling east–west, potentially requiring the use of detour routes around the south end of the Middle Basin. Emergency response times for emergency vehicles that would need to respond through that area would likely increase for an estimated 7 weeks. Given the short duration, impacts are anticipated to be **less-than-significant**.

5.4.1.2 Utilities

The overhaul repairs to the 5th Avenue Dam would require the replacement or overhaul of electrical systems within the dam; however, no utility conflicts are anticipated, and no utilities would be relocated. As a result, there would be **no impacts** on public services or utilities. All other impacts related

to the potential disruption of utility service during construction would be **less-than-significant,** as described in Section 5.3.1 for all action alternatives.

5.4.2 Impacts from Operation

5.4.2.1 Public Services

The Managed Lake Alternative would enhance recreation facilities and could attract additional visitors to the study area. Therefore, it could increase the demand for emergency response services. However, any visitor increase, if it were to occur, would be relatively minor and not expected to require a substantial increase in emergency response services. Therefore, the impact on emergency response would be **less-than-significant.**

5.4.2.2 Utilities

The Managed Lake Alternative would involve recurring maintenance dredging and adaptive management actions to maintain water quality and ecological conditions. None of these activities are anticipated to result in damage to utilities or service interruptions. Recurring maintenance dredging could require the use of temporary power, such as onsite generators or use of existing electricity.

Decontamination stations would be installed at Marathon Park and the Interpretive Center to avoid and minimize the potential spread of aquatic invasive species from watercraft that would be reintroduced to the waterbody. These decontamination stations require the extension of buried electric lines and water lines to the station locations, but would require only minor amounts of electricity and water to operate. Electricity required to power the dam would remain at existing levels.

As a result, **no direct impacts** on utilities are anticipated from the operation of the Managed Lake Alternative.

Same as the No Action Alternative, maximum water levels predicted under the Managed Lake Alternative would be primarily driven by extreme river flooding. Under modeled representative extreme river flood conditions (with 2 feet of RSLR), maximum water levels for the Managed Lake Alternative would be 17.7 feet NAVD88, slightly (≤1 foot) higher than that of the No Action Alternative (Table 5.2). Consequently, there would be a slightly greater extent of upland flooding under the Managed Lake Alternative. This is most likely due to a net reduction in flood storage capacity for the Managed Lake Alternative due to the creation of habitat areas in the Middle Basin, despite the North Basin dredging.

Table 5.2 Summary of Hydrodynamic Model Results for the Managed Lake Alternative – Water Levels under Representative Extreme River Flooding and 100-year Tide (with 2 feet of RSLR)

Flood Event	Location	No Action Alternative	Managed Lake Alternative
Event #1 - Extreme River Flood Event (with RSLR)	Max. Level in Capitol Lake Basin	+21.0	**+21.3**
	Max. Level at Heritage Park (North Basin)	+17.4	**+17.7**
Event #2 - 100-year Tide (with RSLR)	Max. Level in Capitol Lake Basin	+16	**+16.4**
	Max. Level at Heritage Park (North Basin)	+10.8	**+10.2**

Source: Moffatt & Nichol 2020

As with the No Action Alternative, the predicted maximum water levels exceed the flood-proofing elevations set in the Olympia Sea Level Response Plan [preliminary design for the Heritage Park redesign (17.0 feet)]. Therefore, flooding from extreme river flood events is also not mitigated by the current Olympia Sea Level Rise Response Plan under the Managed Lake Alternative. Same as the No Action Alternative, flooding could affect stormwater infrastructure and could result in the need for increased capacity or more active management of increasing peak flows entering the BITP. Impacts would be potentially **significant** on stormwater and other utilities that could be physically or operationally affected during extreme river flood events. This could potentially be mitigated with changes to the flood-proofing design including in the Olympia Sea Level Rise Response Plan.

Same as the No Action Alternative, the Managed Lake Alternative would retain Capitol Lake Basin in its current configuration. As with the No Action Alternative, operational impacts from the Managed Lake Alternative could include the potential for an increased costs for LOTT and stormwater dischargers if required by Ecology to meet water quality standards in Budd Inlet. As described above in Section 5.2.1.2 for the No Action Alternative, LOTT outlines its response to changing conditions that result from regulatory planning efforts and regulatory conditions, such as the Deschutes River/Capitol Lake/Budd Inlet TMDL study through their long-range Capital Improvement Plan (CIP) (LOTT 2020). The issue of allocations is complicated, and there is some uncertainty as to how Ecology would assign allocations in the future. However, if LOTT and stormwater dischargers were required to undertake additional measures as a result of Capitol Lake not meeting its future waste load allocations, the most stringent targets would be expected under the Managed Lake Alternative (or No Action Alternative), and this would be a **significant impact.**

5.5 ESTUARY ALTERNATIVE

5.5.1 Impacts from Construction

5.5.1.1 Public Services

Construction impacts of the Estuary Alternative on emergency response times would generally be the same as described in Section 5.3.1, but would also include impacts related to the closure of the 5th Avenue Bridge for an extended duration. Response times and access for public services and utility providers may be temporarily affected by detours to accommodate removal and reconstruction of the 5th Avenue Bridge. As described above in Section 5.4.1.1., based on their locations in downtown Olympia (Fire District 1) and West Olympia (Fire District 2), service calls within those districts typically do not require an east–west crossing of the 5th Avenue Bridge. However, during multiple or large-scale events, any fire district can respond, which could require travelling east–west. Emergency response times for emergency vehicles that would need to respond through that area would likely increase for an estimated 5.5 years, and would potentially be a **significant impact**.

5.5.1.2 Utilities

Trenching or excavation associated with stabilization and outfall replacement for Deschutes Parkway could result in utility conflicts and disruptions. In most cases, service disruptions would be temporary and typically would not exceed 1 day. An accidental rupture of or damage to utility lines during project construction could also temporarily disrupt utility services. The potential for impact would be minimized with implementation of measures to locate and confirm utility lines, and coordination of final construction plans with utilities.

Construction impacts on utilities under the Estuary Alternative would primarily be associated with the removal/demolition of the 5th Avenue Bridge. Existing major utility lines on the 5th Avenue Bridge, including potable water (12-inch), sewer line (16-inch), and natural gas line (12-inch), would need to be relocated. Utility lines would likely be relocated to the 4th Avenue Bridge, under the proposed pedestrian bridge, or directionally drilled under the opening. The methods for relocating utilities would be identified during the design phase of the project. Service disruptions are expected to be minimal as utility lines would be relocated prior to removal of the bridge. Stormwater outfall replacement along Deschutes Parkway SW and along the Arc of Statehood would avoid temporary impacts on stormwater conveyance either by timing construction to avoid times when stormwater flow would occur, or by providing temporary diversions. With measures to minimize utility disruptions, impacts would be **less-than-significant.**

5.5.2 Impacts from Operation

5.5.2.1 Public Services

Potential operational impacts on public services related to the potential for increased recreational use would be the same as those described under the Managed Lake Alternative. For the same reasons, this impact would be **less-than-significant.**

5.5.2.2 Utilities

Long-term (operation) impacts on utilities would primarily be associated with reestablishing tidal hydrology to the basin.

Reestablishing tidal hydrology to the Capitol Lake Basin would introduce saltwater into locations where existing utility infrastructure is vulnerable to saline conditions. Utility infrastructure within the modeled extent of flooding under RSLR conditions would also be vulnerable. Corrosion of metal utility lines and surfaces is a risk when these objects encounter saltwater. Saltwater may contact buried pipes through increased salinity in groundwater and higher groundwater elevations as a result of sea-level rise. Splash, spray, and direct inundation of pipes suspended along bridge crossings are also a risk during storms. In addition to pipes, electrical and mechanical equipment may be permanently damaged if flooded.

Corrugated metal (steel) pipe outfalls located within the Capitol Lake Basin would likely deteriorate quickly in saltwater. In particular, a number of metal outfalls have been identified as penetrating the bulkhead at the Arc of Statehood. To ensure that implementation of the Estuary Alternative does not result in corrosion of existing infrastructure, vulnerable utilities, including metal outfalls, would be identified and replaced. Stormwater outfalls along Deschutes Parkway would also be replaced as part of the Deschutes Parkway stabilization work.

While design measures are included to replace existing metal outfalls, other low-lying utility lines would remain vulnerable. Suspended utilities at the railroad crossing (hung under pedestrian walkway) would also be potentially vulnerable to saltwater corrosion. The suspended lines are approximately +8 to +9 feet NGVD29, placing them in the intertidal zone (or at least the splash zone). Buried ductile iron utility lines are present in the area, including a 16-inch water line under Marathon Park. Low levels of salinity in groundwater would potentially reduce the life expectancy of the buried pipes. Given the potential for damage, impacts are considered **significant.** With mitigation measures to monitor the utility lines for corrosion and replace the lines if corrosion starts to become considerable, impacts from saltwater exposure could be reduced to less-than-significant levels.

As previously described, flooding in the Capitol Lake Basin and surrounding areas can occur through overland flooding from the Capitol Lake Basin. Under the Estuary Alternative, removal of the 5th Avenue Dam would allow water levels in the basin to rise and fall with the tides. Unlike the No Action and Managed Lake Alternatives, maximum water levels under the Estuary Alternative would be driven by extreme tidal flooding events with RSLR. Under modeled extreme tidal flooding events (with 2 feet

of RSLR), maximum water levels for the Estuary Alternative would be 16 feet NAVD88, approximately 1 foot lower than the modeled maximum water levels for the No Action Alternative, which would occur under extreme river flooding (Table 5.3). Similarly, the extent and depth of flooding would increase in low-lying areas along the entire perimeter of the Capitol Lake Basin, including in the Powerhouse Road area. However, most utilities that may be affected by overland flooding are on the eastern shore of the North Basin, in the vicinity of Heritage Park and Powerhouse Road.

Flooding (beyond No Action) predicted in the Heritage Park area for the Estuary Alternative would be mitigated by a berm and other improvements planned as part of the Sea Level Response Plan.

Table 5.3 Summary of Hydrodynamic Model Results for Estuary Alternative – Water Levels under Representative Extreme River Flooding and 100-year Tide (with 2 feet of RSLR)

Flood Event	Location	No Action Alternative	Managed Lake Alternative	Estuary Alternative
Event #1 - Extreme River Flood Event (with RSLR)	Max. Level in Capitol Lake Basin	+21.0	+21.3	+19.4
	Max. Level at Heritage Park (North Basin)	+17.4	+17.7	+15.1
Event #2 - 100-year Tide (with RSLR)	Max. Level in Capitol Lake Basin	+16	+16.4	+16.7
	Max. Level at Heritage Park (North Basin)	+10.8	+10.2	+16.1

Source: Moffatt & Nichol 2020

The Olympia Sea Level Response Plan recommends creating a raised berm, floodwall, and floodgate in Heritage Park before 24 inches of sea level rise are realized, which would prevent flooding via Capitol Lake for flood elevations up to 17 feet NAVD88. Therefore, additional flooding predicted in the Heritage Park area for the Estuary Alternative would be mitigated by the by the improvements noted in the Sea Level Response Plan.

Because overland flooding related to extreme river flooding would be reduced compared to the No Action Alternative, there would be a **minor beneficial effect** on utilities under the Estuary Alternative.

Ecology is likely to assign the least stringent discharge reduction requirements for LOTT and stormwater dischargers under the Estuary Alternative, based on scenario modeling previously completed by Ecology (Ecology 2015). As a result, **no impacts** are anticipated under the Estuary Alternative related to future waste load allocations associated with Capitol Lake.

5.6 HYBRID ALTERNATIVE

5.6.1 Impacts from Construction

5.6.1.1 Public Services

The potential impacts on public services under the Hybrid Alternative would be the same as those described under the Estuary Alternative. Emergency response times for emergency vehicles that would need to respond through the area would likely increase for an estimated 5.5 years, which would potentially be a **significant impact**.

5.6.1.2 Utilities

The potential impacts on utilities under the Hybrid Alternative would be the same as those described under the Estuary Alternative. Mitigation would also be implemented under the Hybrid Alternative to avoid or minimize damage or significant adverse impacts on utilities. With these measures, construction impacts on public services and utilities would be **less-than-significant.**

5.6.2 Impacts from Operation

5.6.2.1 Public Services

Potential operational impacts on public services related to potential for increased recreational use would be the same as those described for all action alternatives. For the same reasons, this impact would be **less-than-significant.**

5.6.2.2 Utilities

The Hybrid Alternative requires some additional electricity to power permanent lighting along the barrier wall. At the current level of design, the lighting system has not been specified. Conventional street lighting systems can draw up to 500 to 1,000 watts per hour. The final design of the alternative will include a low-energy lighting system and include low wattage lights such as light emitting diode (LED) lamps and, if feasible, would be solar powered.

As with the Estuary Alternative, long-term (operation) impacts on utilities would primarily be associated with reestablishing tidal hydrology to the basin. Given the potential for saltwater to damage low-lying utilities, impacts are considered **significant.** With mitigation measures to monitor utility lines for corrosion and replace the lines if corrosion starts to become considerable, impacts from saltwater exposure could be reduced to less-than-significant levels.

Same as the Estuary Alternative, utility infrastructure within other low-lying areas of the basin would be vulnerable, especially if they include materials susceptible to corrosion. As a result, impacts on utilities under the Hybrid Alternative could be **significant.** With mitigation measures to monitor and replace utility lines, impacts could be reduced to less-than-significant levels. If freshwater were used for the

hybrid reflecting pool, corrosion impacts on outfalls along the Arc of Statehood would be avoided and no replacements would be necessary.

Same as the Estuary Alternative, the maximum water levels under the Hybrid Alternative would be primarily driven by extreme tidal flooding events with RSLR. Under modeled extreme tidal flooding events (with 2 feet of RSLR), maximum water levels for the Hybrid Alternative in the North Basin would be 16 feet NAVD88, approximately 1 foot lower than the modeled maximum water levels for the No Action Alternative, which would occur under extreme river flooding. As with flooding associated with the other action alternatives, flooding would occur in low-lying areas along the entire perimeter of the Capitol Lake Basin. However, the majority of utilities that may be affected by overland flooding are on the eastern shore of the North Basin, in the vicinity of Heritage Park and Powerhouse Road. Unlike the maximum water levels modeled for the Estuary Alternative which are addressed by measures included in the Olympia Sea Level Response Plan, the potential for flooding in the Heritage Park and Powerhouse Road area under the Hybrid Alternative would be addressed by the protective presence of the barrier wall for the hybrid reflecting pool. Same as the Estuary Alternative, there would be a **minor beneficial effect** on utilities due to reduced upland flooding solely related to river flooding.

Table 5.4 Summary of Hydrodynamic Model Results for Hybrid Alternative – Water Levels under Representative Extreme River Flooding and 100-year Tide (with 2 feet of RSLR)

Flood Event	Location	No Action Alternative	Managed Lake Alternative	Estuary Alternative	Hybrid Alternative
Event #1 - Extreme River Flood Event (with RSLR)	Max. Level in Capitol Lake Basin	+21.0	+21.3	+19.4	**+19.7**
	Max. Level in North Basin	+17.4	+17.7	+15.1	**15.4**
Event #2 - 100-year Tide (with RSLR)	Max. Level in Capitol Lake Basin	+16	+16.4	+16.7	**+16.7**
	Max. Level in North Basin	+10.8	+10.2	+16.1	**16.1**

Source: Hydrodynamics and Sediment Transport Discipline Report (Moffatt & Nichol 2021)

The Hybrid Alternative has not been modeled by Ecology so there is uncertainty related to how this alternative would change waste load allocations. It is possible that the Hybrid Alternative could result in more stringent discharge reduction requirements for LOTT and stormwater dischargers than the Estuary Alternative. However, it is likely that requirements for LOTT and stormwater dischargers would be substantially less stringent than would occur under the No Action and Managed Lake Alternatives.

5.7 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

A number of project design features that minimize impacts on public services and utilities have been incorporated into the Estuary and Hybrid Alternatives, including replacing outfalls and other infrastructure vulnerable to saltwater exposure. Additional measures to address adverse impacts are listed below.

5.7.1 Measures Common to All Action Alternatives

5.7.1.1 Construction

- Prior to the completion of final project construction plans, individual utility agencies with utilities located within or adjacent to areas of construction activity shall be contacted to determine the extent and type of temporary protective measures that must be implemented to prevent construction damage to surface and subsurface utilities.
- Coordinate with utility companies and other relevant agencies before construction to locate existing utilities and avoid damage. Avoid the relocation of utilities whenever possible. Provide notification of any potential interruptions in services to the appropriate agencies.
- Stage utility relocations to minimize interruptions in service.
- Prior to construction, consult with local police, fire, and emergency response to develop and implement emergency response plans, establish emergency vehicle routes, and ensure that general emergency management services are not compromised.
- Require contractor(s) to prepare traffic control plans for construction activities that may affect road right-of-way. Measures typically used in traffic control plans include advertising of planned lane closures, warning signage, a flag person to direct traffic flows when needed, and methods to ensure continued access by emergency vehicles.

5.7.2 Measures Specific to Each Action Alternative

5.7.2.1 Managed Lake Alternative

Construction

No additional mitigation would be needed during construction of the Managed Lake Alternative.

Operation

- In coordination with the Olympia Sea Level Response Plan, inclusion of design parameters for the floodproofing design of the Heritage Park berm in consideration of hydrologic modeling completed for this project to account for extreme river flooding.

5.7.2.2 Estuary Alternative

Construction

No additional mitigation would be needed during construction of the Estuary Alternative.

Operation

- During design, complete an evaluation of utilities within low-lying areas potentially vulnerable to flooding under future conditions with RSLR, and coordinate with public and private utility owners in developing a protection or replacement schedule.
- During design, complete an evaluation of utilities potentially vulnerable to seawater corrosion under future conditions, and coordinate with public and private utility owners in developing a monitoring, protection, or replacement schedule.

5.7.2.3 Hybrid Alternative

Construction

No additional mitigation would be needed during construction of the Hybrid Alternative.

Operation

- During design, complete an evaluation of utilities within low-lying areas potentially vulnerable to flooding under future conditions with RSLR, and coordinate with public and private utility owners in developing a protection or replacement schedule.
- During design, complete an evaluation of utilities potentially vulnerable to seawater corrosion under future conditions, and coordinate with public and private utility owners in developing a monitoring, protection, or replacement schedule.

5.7.3 Significant Unavoidable Adverse Impacts

For the Managed Lake Alternative, if Ecology requires LOTT and stormwater dischargers to implement additional measures to improve water quality in the basin, this would be a **significant impact unavoidable impact.**

With the mitigation measures identified above, there would be **no significant unavoidable adverse impacts** on public services or utilities under the Estuary and Hybrid Alternatives.

6.0 References

Blakeway, Cathy. 2020. Personal communication. Telephone conversation with Cathy Blakeway (Tumwater Fire Department) with Madeline Remmen (ESA). October 20, 2020.

Brown and Caldwell. 2010. *Summary Report Recharge and Reclaimed Water Conveyance Alternatives.* Prepared for LOTT Clean Water Alliance. April 2010.

City of Olympia. 2014. *Olympia Comprehensive Plan.* Updated July 2019. <http://olympiawa.gov/city-government/codes-plans-and-standards/olympia-comprehensive-plan.aspx>. Last accessed April 2020.

City of Olympia. 2016. *Comprehensive Emergency Management Plan.* January 2016. <http://m.olympiawa.gov/~/media/Files/Fire/CEMP-2016.pdf?la=en>. Last accessed April 2020.

City of Olympia. 2019. *Draft Wastewater Management Plan*. August 2019. <http://m.olympiawa.gov/city-utilities/wastewater/wastewater-management-plan.aspx>. Last accessed May 2020.

City of Olympia Fire Department. 2018. *Annual Report City of Olympia Fire Department*. <http://olympiawa.gov/~/media/Files/Fire/2018%20Fire-Annual-Report.pdf?la=en>. Last accessed May 2020.

City of Tumwater. 2010. *City of Tumwater Comprehensive Emergency Management Plan*. February 2010. <https://www.ci.tumwater.wa.us/departments/fire-ems/emergency-management >. Last accessed May 2020.

City of Tumwater. 2016. *City of Tumwater Comprehensive Plan*. <https://www.ci.tumwater.wa.us/departments/community-development/tumwater-comprehensive-plan>. Last accessed April 2020.

City of Tumwater. 2018. Draft *Comprehensive Stormwater Management Plan*. Prepared by Herrera Environmental Consultants, Inc. May 2018. <https://www.ci.tumwater.wa.us/departments/community-development/tumwater-comprehensive-plan>. Last accessed May 2020.

City of Tumwater. 2020. *City of Tumwater Comprehensive Water System Plan Update, Agency Review Draft*. Prepared by Herrera Environmental Consultants, Inc. April 2020.

Heffron Transportation, Inc. (Heffron). 2021. *Transportation Discipline Report, Capitol Lake – Deschutes Estuary Long-term Management Project*. Prepared for Washington Department of General Administration. June 2021.

Herrera (Herrera Environmental Consultants, Inc.). 2021. *Water Quality Discipline Report for the Capitol Lake – Deschutes Estuary Long-term Management Project.* Prepared for the Washington State Department of Enterprise Services. June 2021.

Lacey, Olympia, Tumwater, and Thurston County (LOTT). 2020. Budget and Capital Improvements Plan 2019-2020. <https://lottcleanwater.org/wp-content/uploads/budgetCIP19-20.pdf>. Last accessed September 2020.

Lacey, Olympia, Tumwater, and Thurston County (LOTT); City of Olympia; and Port of Olympia. 2019. *Olympia Sea Level Rise Response Plan*. Prepared by AECOM. March 2019. http://olympiawa.gov/~/media/Files/PublicWorks/Water-Resources/SLR/SLR-Plan/SLR-Plan-Complete.pdf?la=en. Last accessed September 2020.

Moffatt & Nichol. 2008. *Capitol Lake Alternatives Analysis Low-Lying Infrastructure*. Prepared for General Administration State of Washington. November 2008.

Moffatt & Nichol. 2020. *Basis of Design Report for Capitol Lake-Deschutes Estuary Long-Term Management Project Environmental Impact Statement*. Prepared for Washington State Department of Enterprise Services.

Moffatt & Nichol. 2021. *Hydrodynamics and Sediment Transport Discipline Report, Capitol Lake – Deschutes Estuary Long-term Management Project*. Prepared for Washington Department of General Administration. June 2021.

Thurston County. 2015. *Thurston County Comprehensive Emergency Management Plan*. August 2015. <https://www.thurstoncountywa.gov/em/Pages/plans-cemp.aspx>. Last accessed April 2020.

Thurston County. 2017. *Thurston County Fire Districts and Stations Map*. <https://www.geodata.org/thumb_2017.aspx?thumb=FireDistricts(54x35)>. Last accessed April 2020.

Thurston County. 2019. *Thurston County Comprehensive Plan*, *Chapter 7 Utilities.* November 2019. <https://www.thurstoncountywa.gov/planning/Pages/comp-plan-current.aspx>. Last accessed April 2020.

Thurston Regional Planning Council. "Capitol Lake Stormwater Outfall Sites." September 24, 2003.

Washington Emergency Management Division. 2018. *Washington State Enhanced Hazard Mitigation Plan.* Effective 2018–2023 (Approved October 1, 2018). <https://mil.wa.gov/enhanced-hazard-mitigation-plan>. Last accessed April 2020.

Washington State Department of Ecology (Ecology). 2012. *Deschutes River, Capitol Lake, and Budd Inlet Temperature, Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Fine Sediment Total Maximum Daily Load Technical Report. Water Quality Study Findings*. June 2012. Publication No. 12-03-008.

Washington State Department of Ecology (Ecology). 2015. *Deschutes River, Capitol Lake, and Budd Inlet Total Maximum Daily Load Study: Supplemental Modeling Scenarios*. Ecology Publication 15-03-002. Washington Department of Ecology.