FINAL LICENSE APPLICATION
EXHIBIT H
ECPA FACTORS

SKAGIT RIVER HYDROELECTRIC PROJECT
FERC NO. 553

Seattle City Light

April 2023

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List of Acronyms and Abbreviations

ACHP.....Advisory Council on Historic Preservation
ADA.....Americans with Disabilities Act
ADAS.....automated data acquisition system
ARMMP.....Archaeology Resource Mitigation and Management Plan
BPA.....Bonneville Power Administration
CETA.....Clean Energy Transformation Act
CFR.....Code of Federal Regulations
CIP.....capital improvement project
City Light.....Seattle City Light
CoSD.....City of Seattle datum
D2SI.....Division of Dam Safety and Inspection
DFDS.....Dam Failure Detection System
DSSMP.....Dam Safety Surveillance and Monitoring Plan
DVDS.....Daily Visual Dam Safety
EAP.....Emergency Action Plan
ECC.....Emergency Communications Center
ELC.....Environmental Learning Center
EMA.....Emergency Management Authority
EPRI.....Electric Power Research Institute
FERC.....Federal Energy Regulatory Commission
FIRO.....Forecast-Informed Reservoir Operations
FLA.....Final License Application
FMP.....Flow Management Program
FPA.....Federal Power Act
FSA.....Fisheries Settlement Agreement
HABS.....Historic American Building Survey
HAER.....Historic American Engineering Record
HRMMP.....Historic Resources Mitigation and Management Plan
IRP.....Integrated Resource Plan
L2RA.....Level 2 Risk Analysis
LP.....licensing participant

MHz .....megahertz
MOA .....Memorandum of Agreement
MP.....milepost
MW .....megawatt
MWh .....megawatt hour
NAVD 88 .....North American Vertical Datum of 1988
NCC .....Non-flow Coordinating Committee
NCI.....North Cascades Institute
NERC.....North American Electric Reliability Corporation
NHPA.....National Historic Preservation Act
NPS .....National Park Service
NWRFC .....Northwest River Forecast Center
NWS.....National Weather Service
LP.....licensing participant
OFCN.....Official Flood Control Notice
O&M.....operations and maintenance
PAX.....Private Automatic Exchange
PME .....protection, mitigation, and enhancement
PMF.....Probable Maximum Flood
PFMA.....Potential Failure Modes Analysis
PPE.....personal protective equipment
Project .....Skagit River Hydroelectric Project
PSM.....Power Structure Mechanic
RCW .....Revised Code of Washington
REP .....Skagit River Riverscape Ecosystem Plan
RLNRA.....Ross Lake National Recreation Area
ROW .....right-of-way
SCADA-EMS .....Supervisory Control and Data Acquisition-Emergency Management System
SCC.....System Control Center
SEEC.....Skagit Environmental Endowment Commission
SHA.....seismic hazard analysis
SHPO .....State Historic Preservation Officer

SMA.....strong motion accelerometers

SOC.....System Operating Center

SR.....State Route

STID.....Supporting Technical Information Document

USACE .....U.S. Army Corps of Engineers

USFS.....U.S. Forest Service

WAC .....Washington Administrative Code

WDFW.....Washington Department of Fish and Wildlife

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EXHIBIT H: ECPA FACTORS

1.0 CONTENTS AND PURPOSES OF THIS EXHIBIT

To ensure that the Federal Energy Regulatory Commission (FERC) has sufficient information to issue a new license, it requires all applicants for new licenses to prepare an Exhibit H containing the information described in FERC regulations at 18 Code of Federal Regulations (CFR) § 5.18(c). The regulations divide the required information into three basic sections: information to be provided by all applicants (§ 5.18(c)(i)), information to be provided by an applicant who is an existing licensee (§ 5.18(c)(ii)), and information to be provided by an applicant who is not an existing licensee (§ 5.18(c)(iii)). Because Seattle City Light (City Light) is an existing licensee within the meaning of Federal Power Act (FPA) Section 15, this Exhibit addresses only the information specified in § 5.18(c)(i) and § 5.18(c)(ii).

Comments filed on Exhibit H of the Draft License Application (DLA; filed November 30, 2022) have been addressed herein and responses to all DLA comments are included in Appendix B of Exhibit E of this Final License Application (FLA).

2.0 INFORMATION TO BE SUPPLIED BY ALL APPLICANTS

This section provides information on City Light's plans and abilities to best utilize the resource represented by the Skagit River Hydroelectric Project (Skagit River Project or Project). Included in this section are descriptions of how the Project generation is used by City Light within its electric system, its coordination with other projects in the Skagit River system, the need for the Project generation, City Light's plans for modifications and improvements of the Project, and discussions of measures taken by City Light to ensure the safe and reliable operation of the Project.

2.1 Plans and Ability to Operate the Project, Maintaining Efficient and Reliable Electric Service

2.1.1 Efforts and Plans to Increase Capacity and Generation at the Project

During the initial and current license terms, City Light has made efforts to maximize possible energy and capacity benefits derived from the Project. Major renewals at the Project since it was completed in 1961 with construction of High Gorge Dam have included generator rewinds at the Gorge Development in 1982, 1983, and 1990; at the Diablo Development in 2018 and 2019; and at the Ross Development in 2005, 2006, 2007, and 2009; as well as replacement of transformers at Ross Powerhouse in 2016 and 2017.

Scheduled generator rewinds and turbine runner replacements will occur at all three Project developments over the course of the new license (and are proposed as part of the Proposed Action; see Exhibit C of this FLA for approximate timeframes of implementation after license issuance) but, if and how much, this standard work will impact generation capacity is currently unknown. City Light does not currently have plans for further capacity upgrades at the Project during the new license term.

There are, however, several proposed projects involving dredging that are expected to affect generation capacity at the Diablo and Gorge developments (described in Exhibit B, Section 5.3, of this FLA. As a result of the proposed projects, the estimated total average annual energy produced by the Project may increase approximately 9,500 MWh, or approximately 1 percent.

2.1.2 Plans to Coordinate Project Operation with Upstream and Downstream Projects

There are no projects on the Skagit River upstream or downstream of the Project that necessitate coordination.

2.1.3 Plans to Coordinate Project Operation with the Applicant's and Other Electrical Systems to Minimize Cost of Energy Production

City Light operates the Project in coordination with its Boundary River Project (FERC No. 2144), long-term purchase contracts with the Bonneville Power Administration (BPA), and wholesale purchases. This coordination is highly seasonal in nature and includes periods of net surplus and periods of net deficit to City Light's hydro system, based on water availability and operating constraints related to flood risk mitigation, environmental stewardship, and recreation.

Working within operating constraints, system operators use remaining flexibility in Project generation in a load-following mode to ensure the delivery of least-cost energy to City Light rate payers. This includes optimizing market opportunities that are available from the Project reservoirs and discharge flexibility. City Light plans to continue this practice of load-following with the Project during the new license term.

2.2 Need for the Electricity Generated by the Project[1]

2.2.1 Role of Project Generation in City Light's System

City Light is an integrated electric utility serving nearly 940,000 people in the greater Seattle metropolitan area and approximately 471,000 residential and non-residential customers. City Light's service territory covers 131 square miles. The City of Seattle depends heavily on hydropower, and the Project is a major contributor to Seattle's resource needs. For example, in 2021 hydropower accounted for 86 percent of Seattle's total power resources, with 23.3 percent provided by the Project (Figure 2.2-1).

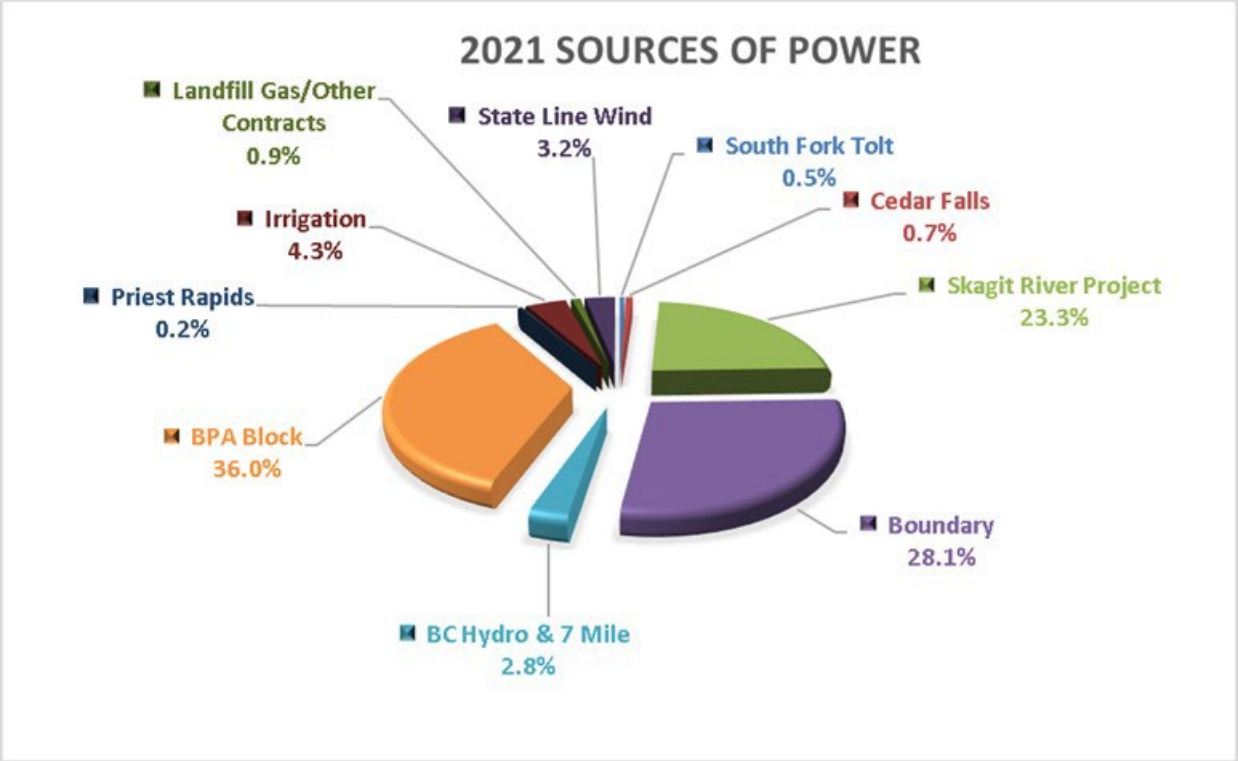

Figure 2.2-1. Sources of City Light's power in calendar year 2021.

As of 2021, City Light had 2,027 megawatts (MW) of installed generation capacity at six power plants (including the Skagit River Project). Additionally, City Light had power supply contracts with the BPA for approximately one-third of City Light's retail needs. Other contracts included hydroelectric output from several irrigation projects, a wind farm, BC Hydro, and other sources. In 2021, City Light's retail sales for the year totaled 8,922,444 megawatt hours (MWh). City Light

[1] Because of the interrelationship between sections (c)(1)(B) and (c)(1)(C) of 18 CFR § 5.18, they are addressed concurrently in this section of Exhibit H.

finished 2021 with total revenues of $1,109 million, expenses of $892 million and net income of $198 million.

The Project is a valuable component of the City Light's generating resources, representing approximately 35 percent of City Light-owned hydroelectric generating capacity and supplying 20 percent (depending on water conditions) of Seattle's power requirements. The Project is also critical for the role it plays as City Light's principal load-following resource. Generation at the Project typically begins in the early morning hours and ramps up to meet peak morning demand. Power is generated throughout the day, rising and falling in response to customer demand, and then increases again to meet peak evening demand.

Much of the Project's value to City Light and the region is due to its flexibility and reliability; that is, its ability to ramp up or down within the hour and in immediate response to customer demand. This flexibility allows the Project to respond to daily fluctuations in customer demand, both in the City of Seattle and the region. This flexibility is possible because of the three-dam system, which allows ramping to occur quickly at the Ross and Diablo plants, with Gorge plant regulating flows downstream to protect anadromous fish. This design is what distinguishes the Project from many other Northwest hydropower facilities with similar generating capacities but only a single dam. Flexible operations at these facilities are typically constrained by ramping regulations for anadromous fish protection downstream.

City Light is proposing the following modifications to Project operations: the Summer Variable Reservoir Operations Zone at Ross Lake; Modifications to Flood Risk Management Operations; Minimum Instream Flows in the Gorge Bypass Reach; and the release of Side and Off-Channel Connectivity and Process Flows as part of the Skagit River Riverscape Ecosystem Plan (REP) Flow Management Program (FMP; see Exhibit B, Section 5.4, of this FLA for additional details about the proposal). Operating the Project as proposed will continue to allow City Light to provide clean, safe, and reliable power to its ratepayers while also protecting anadromous fish in the Skagit River downstream and providing flood risk management benefits. To the extent that a new license imposes constraints on within-hour operations at the Project, City Light and the region will need to replace that power with an alternative resource.

2.2.2 Cost and Value of Project Generation

2.2.2.1 Cost of Project Generation

In 2021, the annual cost of power produced by the Project was $58.4 million, which includes production expenses and an allocated share of debt service. Production expenses were $41.6 million for operations, maintenance, FERC fees, and a share of administrative and general costs based on production costs at the Project. Debt service was $16.8 million, which is allocated based on the Project's share of City Light's net asset value and 2021 debt service payments. This is an average cost of $22.18/MWh. See Exhibit D, Section 6, of this FLA for more details.

2.2.2.2 Value of Project Generation

Replacement Costs of Energy and Capacity

Over the past decade, the regulatory landscape in the Pacific Northwest has changed with the adoption of carbon-free energy laws and policies (Kramer Consulting and Ross Strategic 2022).

The Clean Energy Transformation Act (CETA; Revised Code of Washington [RCW] 19.405) requires all utilities in Washington to provide carbon-neutral electricity by 2030 and 100 percent clean energy by 2045. Because utilities must eliminate coal and gas generation from their portfolios by 2045 or sooner, there has been and will continue to be an increased demand for clean electricity.

The Project generates dispatchable, reliable, and non-emitting hydropower that contributes to the Pacific Northwest region having some of the least carbon-emitting electricity generation in the country (Kramer Consulting and Ross Strategic 2022). The average generation at the Project from 2002 to 2021 was approximately 280 aMW. Within minutes, City Light can ramp up or down production and change the Project's output to meet demand, including during high-load times. The Project can respond to increases in demand resulting from extreme weather events and to energy losses from other sources in the grid.

City Light's ability to ramp up and down the amount of energy generated by the Project due to reservoir storage makes it a reliable source complementary to intermittent resources like wind and solar, which produce variable amounts of energy not by design but because of time of day, weather conditions, and lack of storage. These other renewable energy sources do not have the same ability as the Project to provide variable levels of demand response year-round. Presently, this capability is most needed in winter when energy demand is high and weather extremes are more frequent (Kramer Consulting and Ross Strategic 2022). As climate change progresses, precipitation trends are expected to result in increased water availability during the winter as more precipitation falls as rain rather than snow. Additionally, peak energy demand is shifting because of climate change and peaks can occur in the summer if a heat wave forces residents to use more air conditioning (Kramer Consulting and Ross Strategic 2022). Heat waves most commonly occur in the Pacific Northwest in the late summer, a challenging time for intermittent power sources (Kramer Consulting and Ross Strategic 2022). The Project's non-emitting, dispatchable and flexible energy production characteristics thus are expected to become more valuable to the energy system due to the retirement of thermal generation in the region and as climate change increases variability from historic climate patterns that have been traditionally utilized for forecasting (Kramer Consulting and Ross Strategic 2022).

Nonetheless, replacing the Project's energy production and ancillary services (discussed below) is possible with time, funding, and planning. Replacing the Project's energy production with renewable, carbon-free sources and battery technology to ensure the region's future dispatchable needs are met would add to the challenge, especially because adequate storage options would need to be developed (Kramer Consulting and Ross Strategic 2022). Replacing the energy and capacity from the Project would require constructing or buying output from alternative sources. State permitting regulations and City policies effectively preclude construction of, or contracts with, coal-fired plants and similar restrictions on gas-fired facilities are anticipated in the near future.

Two replacement options for the Project were evaluated using resources identified in City Light's 2022 Integrated Resource Plan (IRP; City Light 2022a):

- 485 MW Southeast Oregon Solar with 194 MW battery; and
- 310 MW Columbia River Gorge Wind.

These two replacement resources would closely match the Project's energy output on an annual basis. There would, however, be significant seasonal differences in output, so these replacement resources would not provide the same level of reliability every month. The replacement projects would provide similar winter reliability but would be less reliable in the summer, with more loss of load events expected.

The cost of the replacement resources, if pursued, is estimated to be a 30-year power purchase agreement costing $149 million per year starting in 2026 with a 3 percent escalation assumption. While the annual energy is expected to be comparable with the Project, the seasonal differences would impact the value of City Light's secondary sales. The value in the change in secondary sales is highly dependent on seasonal wholesale prices. Estimates with current forward prices show the replacement resources increasing Net Wholesale Revenue by approximately $1 million in 2026. Estimates using (lower) prices from a 3rd party fundamental forecast show the replacement resources decreasing Net Wholesale revenue by approximately $7 million in 2026.

Value of Ancillary Services

Ancillary services include the ability of a power plant to respond quickly to changes in load from end-users or changes in supply from intermittent sources such as wind turbines. While the Pacific Northwest does not have an organized market or posted prices for these services, certain proxies are available.

Regional utilities post prices for these services in Open Access Transmission Tariffs and the Northwest Power Planning and Conservation Council estimates and projects these costs into the future. Based on an assessment of growing demand, the price of ancillary services is likely to rise at a rate higher than overall price inflation for the next 20 years.

City Light provides ancillary services from the Skagit River Project, Boundary Project, and through certain contracts as needed by ratepayers and third parties. The ability to provide ancillary services from multiple sources increases City Light's overall ability to respond to changes in load compared to a single-source scenario. Having multiple sources is advantageous to City Light's ratepayers but also complicates the task of estimating ancillary services from a single source, such as the Project.

2.3 Statement of Need for Modifications of the Project Facilities or Operations

2.3.1 Proposal for Facility Enhancements

Scheduled generator rewinds and turbine runner replacements will occur at all three Project developments over the course of the new license (see Exhibit C of this FLA for approximate timeframes of implementation after license issuance). These projects are proposed as part of the Proposed Action. If, and how much, this standard work will impact generation capacity is currently unknown.

There are no specific facility enhancement projects planned that would impact generation capacity at any of the three Skagit River Project developments. There are, however, projects involving dredging proposed as part of the Proposed Action that are expected to affect generation capacity at the Diablo and Gorge developments – the Diablo Tailwater Restoration Project and River

Maintenance, and Upper End of Gorge Lake Grading Project. See Exhibit B, Section 5.3, of this FLA for project details, including conceptual drawings.

2.3.2 Proposed Changes to Project Operations

City Light is proposing the following modifications to Project operations: the Summer Variable Reservoir Operations Zone at Ross Lake; Modifications to Flood Risk Management Operations; Minimum Instream Flows in the Gorge Bypass Reach; and the release of Side and Off-Channel Connectivity and Process Flows as part of the Skagit River REP FMP (see Exhibit B, Section 5.4, of this FLA for additional details about the proposal).

Exhibit E of this FLA includes a list of proposed protection, mitigation, and enhancement (PME) measures to be included in the new license (see Section 3.3.3 for a comprehensive list and Proposed Resource Measures subsections for each resource area in Section 4.2). Many of these PME measures have been developed in coordination with licensing participants (LPs). City Light continues to engage LPs regarding the operations proposal and PME measures that will ultimately be included in the new license. This engagement will continue following submission of this FLA. In the event this engagement results in revisions to the Proposed Action, City Light will supplement its FLA at a later date to incorporate the revisions.

2.4 Conformance with Comprehensive Plan for Development of Waterway

As described in Exhibit E, Section 3.3.3, this FLA includes a list of proposed PME measures to be included in the new license. City Light continues to engage LPs regarding the operations proposal and PME measures that will ultimately be included in the new license to ensure that the Project continues to be compliant with federal and state regional comprehensive plans for developing the waterway and for other beneficial uses in the vicinity of the Project. These plans are listed below and briefly summarized in Exhibit E, Section 7, of this FLA.

- Bureau of Land Management. Forest Service. 1994. Standards and guidelines for management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. Washington, D.C. April 13, 1994.
- Interagency Committee for Outdoor Recreation. 2002. Washington State Comprehensive Outdoor Recreation Planning Document (SCORP): 2002-2007. Olympia, Washington. October 2002. [Updated in 2018 for 2018-2022].
- Interagency Committee for Outdoor Recreation. 1995. Washington State Outdoor Recreation and Habitat: Assessment and Policy Plan 1995-2001. Tumwater, Washington. November 1995.
- Interagency Committee for Outdoor Recreation. 1991. Washington State Trails Plan: Policy and Action Document. Tumwater, Washington. June 1991. [Updated in 2013 for 2013-2018].
- National Park Service. 1988. North Cascades National Park Complex General Management Plan: Lake Chelan National Recreation Area and North Cascades National Park. Department of the Interior, Sedro Woolley, Washington. June 29, 1988.
- National Park Service. 1993. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.

- National Park Service. 2005. North Cascades National Park Complex Fire Management Plan. Sedro-Woolley, Washington. May 2005. [Updated in 2007].
- National Park Service. 2008. North Cascades National Park Complex Mountain Fishery Management Plan. Sedro-Woolley, Washington. June 2008.
- National Park Service. 2011. North Cascades National Park Complex Invasive Non-Native Plant Management Plan. Sedro-Woolley, Washington. November 2011.
- National Park Service. 2011. Ross Lake National Recreation Area General Management Plan. Department of the Interior, Seattle, Washington. 2011.
- National Park Service. 2014. Mount Rainier and North Cascades National Park Complex Fisher Restoration Plan. Ashford and Sedro-Woolly, Washington. 2014.
- National Marine Fisheries Service. Pacific Fishery Management Council. 1978. Fishery management plan for commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California commencing in 1978. March 1978. [Updated in 2021].
- National Marine Fisheries Service. 2006. Final Supplement to the Shared Strategy's Puget Sound Salmon Recovery Plan. Seattle, Washington. November 2006.
- National Marine Fisheries Service. 2008. Recovery Plan for Southern Resident Killer Whales. Seattle, Washington. January 2008.
- National Marine Fisheries Service. 2019. ESA Recovery Plan for the Puget Sound Steelhead Distinct Population Segment (*Oncorhynchus mykiss*). Seattle, Washington. December 2019.
- Pacific Fishery Management Council. 2014. Eighteenth amendment to the fishery management plan for commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California. Portland, Oregon. September 2014.
- Shared Strategy for Puget Sound. 2007. Puget Sound Salmon Recovery Plan. Seattle, Washington. January 2007.
- Skagit River System Cooperative and Washington Department of Fish and Wildlife. 2005. Skagit Chinook Recovery Plan. La Conner, Washington.
- State of Washington. 1977. Statute establishing the State scenic river system, Chapter 79.72 RCW. Olympia, Washington.
- U.S. Fish and Wildlife Service. n.d. Fisheries USA: the Recreational Fisheries Policy of the U.S. Fish and Wildlife Service. Washington, D.C.
- U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American Waterfowl Management Plan. Department of the Interior. Environment Canada. May 1986. [Updated in 2018].
- U.S. Forest Service. 1989. Okanogan National Forest land and resource management plan. Department of Agriculture, Okanogan, Washington.
- U. S. Forest Service. 1990. Mt. Baker-Snoqualmie National Forest Land and Resource Management Plan. Department of Agriculture, Seattle, Washington. June 1990.
- Washington Department of Ecology. 1986. Application of shoreline management to hydroelectric developments. Olympia, Washington. September 1986.

- Washington Department of Fisheries. 1987. Hydroelectric project assessment guidelines. Olympia, Washington.
- Washington Department of Game. 1987. Strategies for Washington's Wildlife. Olympia, Washington. May 1987.
- Washington Department of Natural Resources. 1987. State of Washington Natural Heritage Plan. Olympia, Washington. [Updated in 2018].
- Washington State Parks and Recreation Commission. 1988. Scenic Rivers Program – Report. Olympia, Washington. January 29, 1988.
- Washington State Parks and Recreation Commission. 1988. Washington State Scenic River Assessment. Olympia, Washington. September 1988.
- Washington State Energy Office. 1992. Washington State hydropower development/resource protection plan. Olympia, Washington.
- Washington Department of Ecology. 1994. State wetlands integration strategy. Olympia, Washington. December 1994.
- Washington Department of Fish and Wildlife. 1997. Management Recommendations for Washington's Priority Habitats: Riparian. Olympia, Washington. December 1997. [Updated in 2018].
- Washington Department of Natural Resources. 1997. Final Habitat Conservation Plan. Olympia, Washington. September 1997.
- Washington Department of Fish and Wildlife. 2004. Management recommendations for Washington's priority species, Volume IV: Birds. Olympia, Washington. May 2004.
- Washington Department of Fish and Wildlife. 2005. Washington's Comprehensive Wildlife Conservation Strategy. Olympia, Washington. September 19, 2005.

The existing Project provides beneficial public uses, including recreational opportunities, in addition to its energy generation benefits, and in general conforms with the comprehensive plans and strategies that apply to the waters and lands occupied by the Skagit River Project. City Light believes the Project, including any proposed modifications and measures described in this FLA, will continue to provide beneficial uses as defined in section 10(a)(1) and (2) of the FPA.

2.5 Financial and Personnel Resources for Operations and Maintenance of the Project

2.5.1 Financial Resources

City Light provides electricity to a stable and diverse group of residential, commercial, and industrial customers in Seattle and other jurisdictions extending 3 to 4 miles north or south. The population in City Light's service territory is estimated to be approximately 940,000. Retail revenue was $964 million in 2021 and accounts for around 90 percent of total operating revenue. Retail sales fund both current operations, debt service, and part of the ongoing capital program with no special designation for any specific project(s). City Light's policy is to fund on average at least 40 percent of its net capital program with operating cash and the remainder with revenue bonds. City Light's obligations under a new license would be primarily capital and funded

similarly, part upfront and part over time through debt service. City Light has a strong credit rating and a stable outlook from both Moody's (Aa2) and S&P (AA). The City of Seattle also has a high credit rating (Aaa from Moody's, AAA from S&P).

City Light's financial resources for operations and maintenance (O&M) of the Skagit River Project come from retail revenue and net wholesale revenue. In 2022, these were $1,021 million and $13 million, respectively. These revenues support all City Light activities, with no special designation given to generation projects or distribution services.

2.5.2 Personnel Resources

The Project is a fully staffed facility with a crew of 92 full-time employees on site. Table 2.5-1 identifies the number of employees, by job title, assigned to the facility.

Additionally, 15-20 seasonal employees work at the Skagit River Project. Throughout the course of any given year there are often a large number of temporary City Light employees, consultants, and contractors working at the Project. The regular staff is also complemented with temporary employees during Project maintenance outages.

Table 2.5-1. City Light O&M permanent staff for the Skagit River Project.

O&M Category	Number of Employees
Hydroelectric Maintenance Machinists	9
Iron Workers	3
Engineering Staff (on site)	2
Electrical Constructors	11
Comms Electricians	3
Protection and Control Electricians (PaCE)	2
Generations Operations Staff	15
Boat Operators	2
Grounds Maintenance	10
Warehouse Staff	2
Management and Office Staff (on-site)	11
Archeological & Environmental	2
Painters	4
Carpenters	2
Power Structure Mechanics (PSM)/Truck Driver	4
Auto Mechanics	3
Plumber	1
Camp Service Aides	3
Cook	1
Store Clerk	2

The Hydroelectric Maintenance Machinist Crew is specifically trained on specialized equipment such as governor controls, welding technology, machine tools, rigging, and alignment. Several of

the senior mechanics have reached the AA Serviceman level of competency and are some of the most highly trained personnel at City Light. The PSM Crew is trained to operate heavy machinery and is experienced with the types of equipment typical to remote generation facilities. All employees on crew are licensed by the Washington Department of Transportation to operate large heavy trucks on public roads. The generation operations staff is the most highly trained group on site. Training is performed by members of the hydro support group, and records are maintained for each operator. The Electrical Constructors at the Project are also qualified as wiremen.

To ensure optimum maintenance of all facilities, the Project is fully equipped with a full complement of heavy equipment and multiple shops, including machine, weld repair and fabrication, electrical, PaCE, paint, carpenter, communications, and automotive. The powerhouses are not staffed 24/7 but Generation Supervisors are available 24/7 and are called out by City Light's System Operating Center (SOC) when needed. All other support groups are available during normal working hours with on-call capability as needed and called out by Generation Supervisors. The Project is connected to the SOC and other support groups in Seattle by computer, phone line, radio, and satellite communication.

The on-site personnel are backed up by support groups in Seattle that provide direction in the areas of environmental concerns, FERC requirements, contract questions, and financial and budget requirements, as well as engineering solutions and predictive/preventative maintenance programs. These groups provide on-site services when required.

Technical services and direction are also available from City Light's other hydroelectric facilities and Service Centers in Seattle. These facilities share manpower, expertise, spare parts, and tooling, as well as new ideas, with each other. They are all tied into outside support organizations such as the Electric Power Research Institute (EPRI) and Northwest Power Pool, thereby providing contact with other hydropower peer groups that discuss new designs and innovative repair and maintenance concepts.

2.6 Plans to Include Additional Lands in the Project Boundary

As described in Exhibit G of this FLA, City Light proposes to adjust the Project Boundary around each of the three reservoirs. The buffer zone around Ross Lake will change from 200 horizontal feet to a contour 10 feet from the High Ross normal maximum water surface elevation. The Gorge and Diablo lakes normal maximum water surface elevations were re-generated based on recent LiDAR and bathymetry data, resulting in slight adjustments to the 200 horizontal foot buffer around each. Doing so will require the addition of some new lands within the Project Boundary and the removal of other lands. Other specific proposed changes to the Project Boundary include certain existing Project features (e.g., Environmental Learning Center [ELC] water tank, Babcock Communication Site, Taylor Spawning Channel and Park Slough off-site fish habitat sites, and a portion of the North Mountain Substation) that also requires the addition of some new lands to the Project Boundary. City Light also proposes to expand the Project Boundary to include Project Routes (roads and trails) not already contained within the boundary. City Light has notified, by certified mail, the owners (private and agencies) of all new lands to be included within the Project Boundary of these proposed changes.

2.7 Electric Consumption Efficiency Improvement Programs

2.7.1 Seattle City Light's Record of Conservation Assistance Programs

Seattle has the longest continuously operating municipal energy conservation initiative in the nation. The effort began in 1972 when the "Seattle 2000" Commission identified energy conservation as the priority power source to serve the City's growing electrical load. City Light developed its first energy conservation programs in 1977 when Seattle's elected officials, working with an appointed citizen committee, determined that Seattle's load growth would be met with energy conservation. In subsequent legislation, the City designated conservation (and renewable energy) as the priority energy resources.

This policy direction of energy conservation continues today. The City and City Light have stayed committed to energy efficiency because it is clean, green, low cost, local, and provides high value to the utility's customer-owners. With incentives for purchasing more efficient equipment, City Light customers use less energy. Energy resource investments therefore remain local – spurring green jobs and economic development – and the utility can sell more clean energy to the real-time energy market.

City Light initially provided weatherization services (e.g., windows, wall insulation, and water heater tank wraps) in the homes of low-income elderly customers. Over time, the utility expanded these services to the commercial and industrial sectors and eventually increased the efficiency of lighting, motors, and heating and cooling equipment. City Light also worked with these sectors to develop custom energy management solutions. These interventions continue today. City Light programs help customers maximize the performance of their existing buildings (with capital, O&M, and behavioral improvements), advance the design of new construction projects (to exceed energy code requirements), and purchase more efficient products through distributor and retail channels. These incentives help to "buy-down" the higher first cost of premium efficiency products and improve the economics and financial returns over the life of the product or project.

In 2021, City Light supported customers' projects with more than $12.2 million in energy efficiency incentives. This support came in different forms: rebates; direct installations where City Light provides and puts in place energy saving measures for free; midstream interventions where City Light provides financial and behavioral nudges to retailers and distributors; and market transformation investments, which remove barriers to drive permanent change throughout the supply chain. City Light helps customers save energy in a myriad of ways: by providing incentives to retailers to stock more efficient appliances like water heaters, by paying and training contract staff who provide outreach to low-income multifamily buildings and who install energy efficient showerheads and lights, and by supplying custom expertise and incentives to large and small customers alike.

A summary of electricity savings, by sector, from conservation efforts is provided in Table 2.7-1.

Table 2.7-1. Annual program electricity savings.[1]

Year	Residential Programs (MWh)	Commercial Programs (MWh)	NEEA (MWh)	Industrial-Government Programs (MWh)	Total Savings (MWh)
1977	116	0	0	0	116
1978	1,680	0	0	0	1,680
1979	4,591	2,592	0	0	7,183
1980	5,940	1,784	0	917	8,641
1981	5,103	5,539	0	1,434	12,076
1982	39,022	8,415	0	2,152	49,589
1983	28,855	13,113	0	10,044	52,012
1984	12,843	9,689	0	5,686	28,218
1985	9,092	8,497	0	5,532	23,121
1986	9,887	7,455	0	5,843	23,185
1987	8,426	3,848	0	2,744	15,018
1988	8,671	10,021	0	955	19,647
1989	6,955	4,029	0	3,387	14,371
1990	6,864	8,953	0	2,779	18,596
1991	6,168	20,056	0	686	26,910
1992	34,788	21,358	0	5,734	61,880
1993	18,980	35,215	0	5,071	59,266
1994	18,941	45,604	0	3,840	68,385
1995	16,247	36,340	0	14,718	67,305
1996	8,836	39,350	0	9,732	57,918
1997	11,696	23,568	0	4,575	39,839
1998	10,649	53,566	0	2,617	66,832
1999	14,748	34,315	0	13,470	62,533
2000	12,700	33,280	0	1,779	47,759
2001	38,647	49,604	0	2,954	91,205
2002	27,527	38,097	0	9,287	74,911
2003	12,086	33,047	0	5,985	51,118
2004	9,252	35,554	0	16,915	61,721
2005	12,548	33,238	0	9,391	55,177
2006	9,289	37,383	0	10,940	57,612
2007	21,254	35,909	0	0	57,163
2008	62,969	32,189	0	3,500	98,658
2009	50,837	52,973	0	3,538	107,348
2010	64,577	56,166	0	10,808	131,551
2011	66,027	34,374	0	15,509	115,909
2012	48,821	39,489	26,788	10,822	125,921
2013	49,942	35,646	31,888	9,291	126,766
2014	44,473	48,526	40,999	18,925	152,924

Year	Residential Programs (MWh)	Commercial Programs (MWh)	NEEA (MWh)	Industrial-Government Programs (MWh)	Total Savings (MWh)
2015	43,686	50,314	40,253	4,648	138,901
2016	52,327	57,241	7,625	6,235	123,427
2017	50,040	47,614	16,214	31,294	145,162
2018	38,478	57,317	26,613	16,314	138,722
2019	36,147	51,826	25,688	14,741	128,402
2020	26,780	38,908	32,383	10,935	109,006
2021	32,661	42,181	34,993	6,885	116,720
Total	1,100,166	1,334,182	283,445	322,611	3,040,404

1 Savings are aggregated from individual conservation programs. Source: Energy Conservation Accomplishments (1977-2006) and Energy Independence Act Report Archives (2007-2021) (City Light 2007 and 2022b, respectively).

In 1978, City Light conservation programs saved approximately 1,700 MWh annually; by 2021, the combined residential, commercial, market transformation, and industrial programs saved 116,720 MWh annually, or the equivalent annual electricity use of 15,240 average Seattle homes. From 1977 through 2021, conservation programs saved over 3.04 terawatt hours. These savings, accrued since the start of all programs, would be enough to provide electricity to approximately 400,000 homes for one year (almost the same number of homes in City Light's entire service area). Energy savings in 2021 from participants with active measures totaled approximately 1,240,200 MWh, enough to power almost 162,000 average Seattle homes (over a third of City Light's residential service).

2.7.2 Seattle City Light's Plans and Capabilities to Promote Future Conservation

City Light's commitment to energy efficiency remains strong. A continued investment in energy efficiency programs will help City Light meet state regulatory requirements (such as RCW 19.285.040), maintain its status as a greenhouse gas neutral utility, and support the City's environmental and climate change policy goals. A focus on energy efficiency also helps City Light balance anticipated load growth from building and transportation electrification. The 2022 IRP notably demonstrates a future need for new resources and projects that by 2027-2028, City Light will need additional resources to meet the new electrification loads. Energy efficiency is a cost-effective tool that will help keep rates low for City Light's customers (City Light 2022a).

City Light prepares a Conservation Potential Assessment every two years to produce rigorous estimates of the magnitude, timing, and costs of conservation resources within the City Light service territory. The assessment sets two-, four-, ten-, and twenty-year savings targets, as required by Washington Administrative Code (WAC) 194-37-070 (Development of conservation potential and biennial conservation targets), RCW 19.280.030 (Development of a resource plan), and WAC 194-40-200 (Clean energy implementation plan).

The most recent Conservation Potential Assessment specified that City Light's future energy conservation targets will be largely based on the commercial sector (Table 2.7-2). The remaining thirty percent is split between residential and industrial sectors.

Table 2.7-2. 2022 Conservation Potential Assessment: achievable economic potential by sector (MWh).

Sector	2-Year (2022-2023)	4-Year (2022-2025)	10-Year (2022-2031)	20-Year (2022-2041)
Residential	25,404	45,727	97,762	156,892
Commercial	121,326	227,585	500,021	678,725
Industrial	17,432	35,303	75,774	91,454
Total	**164,162**	**308,615**	**673,556**	**927,071**

City Light is committed to providing energy efficiency products and services for residential, low income, commercial, and industrial customers. However, as technologies and customer expectations shift, the form of these offerings will also evolve. In the coming years, City Light will invest less in lighting-based savings (reflecting less opportunity resulting from more stringent codes and standards) and will invest more in whole-building approaches that bundle conservation with demand response and electrification technologies. There will also be continued robust support of low-income programs and the development of more social equity-focused offerings to address the communities and individuals who might otherwise be left behind by the statewide transition to a clean energy economy. Lastly, and most importantly, City Light will more actively incorporate customer and community preferences and perspectives into program design to ensure that conservation offerings meet customer energy needs now – and for the next fifty years.

2.8 Comparison of the Impact on the Operations and Planning of the Applicant's Transmission System of Receiving or not Receiving the Project License

(1) Analysis of the effects of any resulting redistribution of power flows on line loading (with respect to applicable thermal, voltage, or stability limits), line losses, and necessary new construction of transmission facilities or upgrading of existing facilities, together with the cost impact of these effects:

The Project includes 312.93 circuit miles of dedicated transmission lines that can carry the entire load from the Project to Seattle. The lines terminate at the Bothell Substation just north of Seattle. A second substation near Darrington, North Mountain, is jointly owned by City Light and Snohomish Public Utility District. This substation gives City Light the ability to interconnect with other utilities to balance regional supply and demand, if needed. Since the existing facilities are capable of handling the maximum capacity of the Project, no impacts to line loading, line losses, new construction of transmission facilities, or upgrading of existing facilities would be necessary whether or not a new license is issued.

(2) Analysis of the advantage that the Applicant's transmission system would provide in the distribution of the project's power:

The Project's transmission system is necessary to the delivery of the Project's power to customers. If the Project was operated by another entity, the new licensee would be required to either wheel the power through the existing transmission system or construct additional facilities. In the absence of a new licensee, the dedicated transmission lines would not be required.

(3) Detailed single-line diagrams, including existing system facilities identified by name and circuit number that show system transmission elements in relation to the project and other principal interconnected system elements. Power flow and loss data that represent system operating conditions may be appended if Applicants believe such data would be useful to show that the operating impacts described would be beneficial.

A single-line diagram of the various components of this system is provided with the Project design drawings in Exhibit F of this FLA (F-14 through F-19).

2.9 Names and Mailing Addresses of Indian Tribes and Other Native Organizations Consulted

Early in the relicensing process, City Light identified and contacted the following Indian Tribes and Canadian First Nations for the purpose of consultation pursuant to Section 106 of the National Historic Preservation Act (NHPA), and has consulted with these organizations, adding to the list as appropriate, throughout the relicensing process:

Confederated Tribes of the Colville Reservation
P.O. Box 150
Nespelem, WA 99155

Lummi Nation
2665 Kwina Road
Bellingham, WA 98226-9298

Muckleshoot Indian Tribe
39015 172nd Avenue Southeast
Auburn, WA 98092

Nlaka'pamux Nation Bands Coalition
P.O. Box 130
Spences Bridge, British Columbia, V0K 2L0

Nlaka'pamux Nation Tribal Council
P.O. Box 430
Lytton, British Columbia, V0K 1Z0

Nooksack Indian Tribe
P.O. Box 157
Deming, WA 98244

Samish Indian Nation
Summit Park Campus
Chelángen Department
8327 Summit Park Road
Anacortes, WA 98221

Sauk-Suiattle Indian Tribe
5318 Chief Brown Lane
Darrington, WA 98241

Snoqualmie Indian Tribe
P.O. Box 969
Snoqualmie, WA 98065

S'ólh Téméxw Stewardship Alliance
7201 Vedder Road, Bldg #10
Chilliwack, British Columbia V2R 4G5

Stillaguamish Tribe of Indians
P.O. Box 277
Arlington, WA 98223

Suquamish Tribe
P.O. Box 498
Suquamish, WA 98392-0498

Swinomish Indian Tribal Community
11430 Moorage Way
La Conner, WA 98257-8707

Tulalip Tribes of Washington
6406 Marine Drive
Tulalip, WA 98271

Upper Skagit Indian Tribe
25944 Community Plaza
Sedro-Woolley, WA 98284

3.0 INFORMATION TO BE PROVIDED BY THE APPLICANT WHO IS AN EXISTING LICENSEE

3.1 Measures Taken or Planned by the Applicant to Ensure Safe-Management, Operation, and Maintenance of the Project

3.1.1 Overview

The Skagit River Project is normally staffed with a crew of 92 full-time employees. The dayshift includes a full complement of superintendents, technicians, mechanics, electricians, and others necessary to carry out routine operations, inspections, and maintenance activities. City Light employees follow established procedures and guidelines to ensure safe management, operation, and maintenance of the Project. Dam Safety Surveillance and Monitoring Plan (DSSMP) documents provide direction on monitoring and evaluating the safety of the dams and appurtenant structures. The scope and frequency of the various required inspection and monitoring activities are based on the identified potential failure modes at each dam. Other documents such as the Emergency Action Plan (EAP) and Public Safety Plan are also developed and maintained to ensure Project and public safety.

3.1.2 Existing and Planned Operation of the Project During Flood Conditions

Under existing operations, Ross Lake is drawn down on a yearly basis during winter to capture flows from spring runoff and to provide for downstream flood risk management. The drawdown typically begins the Tuesday after Labor Day and continues until the lake reaches its lowest level in late March or early April. Article 301 of the current Project license requires City Light to draw down Ross Lake to a level that provides 60,000 acre-feet of storage for flood risk management by November 15 and 120,000 acre-feet by December 1, and to maintain this available storage through March 15. City Light must also comply with Details of Regulation for Use of Storage Allocated for Flood Control in Ross Reservoir, Skagit River, WA (U.S. Army Corps of Engineers [USACE] 1967), which is incorporated into the Project license by reference. This document was updated in 2002 and provides the current guidance for Project operations for flood risk management (USACE 2002).

Flood risk management operations are initiated by the Seattle District, USACE, Reservoir Control Center whenever it receives a flood forecast from the National Weather Service (NWS), Northwest River Forecast Center (NWRFC), or a flood forecast prepared internally indicating that natural flows at Concrete will reach 90,000 cfs in 8 hours on a rising flood. The Reservoir Control Center notifies City Light and initiates an official flood risk management operation at that time. This flood notification is referred to as an "Official Flood Control Notice (OFCN)." The OFCN is logged by the Reservoir Control Center and City Light at the time it is issued/received. The Reservoir Control Center also notifies the System Control Center (SCC) and cancels the OFCN when the flood risk management operation is ended. During the flood period through which the Reservoir Control Center controls operations of the Project, City Light retains the right to discharge up to 5,000 cfs from Ross (plus or minus 20 percent allowances for operational latitude) as such flows are necessary for normal generation at the other two Project developments. Additionally, Ross Lake may be surcharged if the water surface elevation reaches 1,608.76 feet North American Vertical

Datum of 1988 (NAVD 88; 1,602.5 feet City of Seattle datum [CoSD])[2] before flood recession occurs to provide the additional reduction of release downstream.

The Skagit River Project Water Control Manual (USACE 2002) describes the USACE water control plan for the Skagit River Project, which is the maximum beneficial use of flood risk management storage at Ross to reduce flooding in the lower Skagit Valley during the October-March flood season. During flood events, both Ross and Upper Baker are coordinated concurrently by the Reservoir Control Center to optimize their combined flood risk management storage. See Section 2.3.3 of Exhibit B of this FLA for additional details about the current flood risk management procedure during a flood event.

City Light is proposing the following modifications to Project operations: the Summer Variable Reservoir Operations Zone at Ross Lake; Modifications to Flood Risk Management Operations; Minimum Instream Flows in the Gorge Bypass Reach; and the release of Side and Off-Channel Connectivity and Process Flows as part of the Skagit River REP FMP (see Exhibit B, Section 5.4, of this Exhibit E for additional details about the proposal).

Specific to planned operations during flood conditions, and as described in Section 3.3.1 of Exhibit E of this FLA, City Light is proposing to develop a Flood Risk Management Implementation Plan, for FERC approval, in consultation with the USACE and other LPs.

3.1.3 Measures Taken to Evaluate Seismicity and Related Hazards that Could Affect the Project

3.1.3.1 Seismic Hazard Potential

The Project is in an area of low seismicity. The most notable past earthquake to occur was the February 28, 2001, Nisqually, Washington earthquake. This magnitude 6.8 earthquake at an epicentral distance of 210 kilometers (130 miles) was felt in nearby communities and at the Project; however, the seismographs at Ross Dam did not record the event. City Light, as a component of its existing operations, inspects the Project following the occurrence of any earthquake that is felt at the site using the Daily Visual Dam Safety (DVDS) inspection checklist, which is expanded to include an assessment of rock fall or debris on access roads. Dam safety engineers are dispatched following seismic events to take instrumentation readings and assist with visual inspections. There are two strong motion accelerometers (SMA), located in the upper gallery and the right abutment at Ross Dam, which have a trigger acceleration of 0.05g.

Additional seismic stations associated with the Pacific Northwest Seismic Network are located southwest of the Project at Marblemount and to the northwest of the Project at Mt. Shuksan (HDR 2022a). The Project site-specific probabilistic and deterministic seismic hazard analyses (SHA) was recently completed and approved by FERC (GeoEngineers 2022).

[2] City Light is in the process of converting Project information from its older vertical elevation datum (CoSD) to the more current and standardized elevation datum (NAVD 88). As such, elevations are provided relative to both data throughout this FLA. The conversion factor between CoSD and NAVD 88 varies depending on location. A table converting elevation values of common benchmarks, staff gages, and key Project features from CoSD to NAVD 88 and a map of the same features are appended to this FLA (Appendix C in Exhibit E), both of which have been updated since first being provided in the PAD.

3.1.3.2 Integrity of the Dam under Seismic Loading

The Supporting Technical Information Documents (STID) – one for each development – contain a detailed discussion concerning the suitability of existing structures under various seismic loading events. City Light plans to perform new structural analysis of the dams using the recently updated seismic loading. The current STIDs (from December 2017) are on file with FERC, Accession Number 20180108-0196 (City Light 2017a, 2017b, and 2017c).

3.1.3.3 Existing Geological Hazards

The Project is periodically reviewed for seismic and other geologic hazards that might impact dam safety through the required Part 12 dam safety inspections under FERC's authority. If a potential geologic hazard requires further investigation, City Light and its consultants perform the recommended investigation at their discretion to better characterize and assess the hazard. All three developments are sited in the Skagit gneiss complex, which creates a robust foundation, both geologically and structurally.

Although the geologic setting provides robust foundations for the dams, the three Project developments are in an area prone to geologic hazards. Rockfalls occur frequently along SR 20, the major access route to and through the Project vicinity. The primary geologic hazards associated with the developments from a dam safety and operations perspective are rockfalls from cut slopes behind the powerhouses and along access roads. Examples include:

- Two rockfall events occurred in October 2021 at the Diablo Development, on the slope behind the powerhouse. One rockfall resulted in a 2-foot diameter hole in the roof of the powerhouse and damage to equipment inside. The other incident involved a 20-foot slide, which flooded the powerhouse and caused a temporary outage. On the day of the Part 12 inspection, the slope showed no signs of potential instability; however, the slope may still be prone to slope movement (HDR 2022b). Work was initiated in 2022 to stabilize the slope and install additional rock containment.
- In March 2010, a large rockslide occurred at the Ross Development, burying the road between the powerhouse and the dam and cutting off access between these two facilities. It also destroyed or damaged two barge landings required to transport materials and equipment to Ross Powerhouse, as well as two docks owned by the National Park Service (NPS). Despite rock scaling, bolting and blasting, this slope remains unstable and there is a catchment trench and a rock fence to prevent debris sloughing off the slope from reaching the road.

3.1.4 Warning Devices Used to Ensure Downstream Public Safety

City Light has prepared and filed with FERC an EAP (City Light 2022g) for the Project that provides a detailed action plan and notification procedure in the event of a major discharge from any of the Project dams or spillways.

The powerhouses at the Project are staffed from 6:00 a.m. to 4:30 p.m. seven days a week, and a Generation Supervisor is on-call 24 hours per day, seven days a week. Various procedures and systems are in place for surveillance and detection of a dam safety emergency, should one occur. These range from daily dam inspections by operations staff, periodic inspection, monitoring, and evaluation by City Light's engineers, consultants, and FERC engineers to Dam Failure Detection

System (DFDS). Activation of DFDS will trip an alarm both at the power plant control room and at the City Light SOC in Seattle. In the event of an alarm, surveillance cameras at each dam provide a visual confirmation of current conditions and can be viewed from each dam's respective powerhouse and the SOC. A Hydro operator and/or SOC dispatcher will respond to any unusual dam safety-related observations/reports or DFDS alarms by following the emergency response process outlined in the EAP. The emergency response process includes inspecting, verifying, and evaluating the dam condition, determining the emergency level, and activating the appropriate EAP notification chart, if necessary. Three separate DFDSs are installed at each dam, except where otherwise noted, and are identified as follows:

- Hardwire Dam Failure Alarm – An electric current transmitted through a wire looped across the dam crest and through the dam gallery will activate an alarm if severed.
- Reservoir Rapid Level Change Alarm – A software package built into the Supervisory Control and Data Acquisition-Emergency Management System (SCADA-EMS) monitors water surface elevation data and trips an alarm in response to a rapid change in reservoir elevation.
- Tailwater Elevation Alarm – A water level sensor at the Gorge plunge pool detects elevated tailwater and sends an alarm if the measured level exceeds a preset value.
- Gallery High Inflow Alarm – Float switches mounted in the drainage gutter in the dam gallery will trip an alarm if inflow to the dam exceeds preset limits (installed only at Ross and Gorge dams).
- Video Monitoring System – Video cameras are located throughout the Project at all the dams. Real-time images from the surveillance cameras are accessible on City Light's computer network including the SOC, the Skagit River Project office, Project powerhouses, and security. A video monitoring station is also located downstream of each Skagit River Project dam for visual verification of a failure alarm. For each dam, a camera is focused on a water level gage within the flood plain immediately downstream of the dam.

The purpose of the Gallery High-Inflow Alarm is to detect development of a potentially hazardous situation, whereas the other three alarms are primarily intended to detect a sudden dam failure.

When the EAP is activated for a given emergency condition, an SOC dispatcher immediately contacts the Emergency Management Authorities (EMA) and local, state, and federal entities in the Project vicinity, as well as the City Light leadership team and additional personnel responsible for notifying resource agencies, Indian Tribes, and other parties as outlined in the appropriate notification chart for various emergency conditions. When activating the EAP for an *Imminent Failure* emergency condition, the SOC Dispatcher or powerhouse Operator will activate the Newhalem and/or Diablo evacuation sirens.

The primary means of voice communication for Project personnel is via telephone circuits. Means of contacting the City Light SOC in Seattle include:

(1) Two landlines, one available 24 hours a day;

(2) Two Private Automatic Exchange (PAX) lines (City Light telephone system) connect the Project to the SOC, with one available 24 hours a day; and

(3) Satellite phones at the Project and SOC.

There is also a 2-way radio call alert system in place between the SOC and the Project for use in the event of an imminent failure.

The Skagit River Project data and voice communication system is a complex network of microwave radios, fiber optics, automatic telephone switching equipment, and two-way radios.

- Microwave/Fiber-optic Network for Voice and Data Communication

  The primary system for communication from Seattle to the Project is the microwave/fiber-optic system. This system is designed to provide protection against the failure of a single component. circuits reach the Project through the fiber-optic system and then go through automatic telephone switching equipment for the City Light (PAX) and the SL1 system. Terminal equipment at the Project is located in the floodplain. Communication through this system would be lost in the event of a dam failure.

  Babcock Creek is not in the floodplain. This is a site with an 800-megahertz (MHz) radio repeater. It does not communicate directly with Seattle and would only function as a local repeater in the event of flooding. The 37-MHz radio at Babcock only has one control point at Gorge Powerhouse, which is in the floodplain.

  Radio communication within the Project is via an 800-MHz simulcast radio system. Supervisors, crew chiefs, and critical personnel can be paged with this system. Vehicles are also equipped with 800-MHz radios. All Project locations from Newhalem to Ross Dam can be reached by this system. Any City Light phone in Seattle can access the Skagit 800-MHz radio system. The City Light SOC can broadcast on the Skagit 800-MHz system using the microwave/fiber-optic link to the Project.

  Most Project radio base stations are located in the floodplain. In the event of a dam failure, vehicles with mobile radios could be driven to higher elevations and used as manual repeater stations within areas of the Project.

- Satellite

  A satellite phone system is in service at the Project for emergency back-up communications. This system provides voice communications between satellite units and to phone subscribers serviced by commercial carriers. Each powerhouse and both fire stations in Newhalem have been assigned a satellite phone for emergency use.

- Skagit County Fire Infrastructure

  Another means of communication is through the Skagit County Fire One radio communication system. This system allows direct communication between Newhalem or Diablo and the Skagit County 9-1-1 Emergency Communications Center (ECC).

- Whatcom County Sheriff's Radio

  As a backup communication link, contact with the City Light SOC can be accomplished through the Whatcom County Sheriff's radio at Newhalem to Bellingham, then by landline to the SOC.

3.1.4.1 Proposed Capital Improvement Projects for New License

Physical Security and Surveillance Improvements

Physical security measures and surveillance devices of Project facilities are crucial components of City Light's physical security, public safety, and dam safety programs. City Light must comply with North American Electric Reliability Corporation (NERC) and FERC requirements throughout the Project to detect security threats quickly, prevent unauthorized access to critical energy infrastructure facilities, ensure unauthorized individuals do not enter potentially hazardous areas, and for both local and remote operations staff to confirm Project facilities and physical security measures are operating as intended.

City Light must regularly replace, modify, or add physical security measures or surveillance devices to Project facilities for NERC and FERC compliance, to address potential vulnerabilities, and to confirm safe project operations. Improvements may consist of but are not limited to cameras, fences and other barriers, gates, and illumination (visible light and/or infrared). Improvements may require new or replaced power and communication infrastructure to the site.

Early Warning System Improvements for Public Safety

Early warning systems are a key element for dam safety programs and public safety. City Light maintains a system of early outdoor warning sirens (sirens) at the Skagit River Project, primarily around the Diablo and Newhalem townsites, and near the Diablo boathouse. Having early notification is paramount to public safety in the unlikely event of a dam failure or other uncontrolled release of water, incident, or controlled release in which evacuation of populated areas downstream of a dam may be required. Further, wireless emergency alerts to mobile phones/devices are another effective tool to provide early warning to the public about evacuations or other matters of public safety and are also included in these facility enhancements. Lastly, improved cellular coverage to Project personnel provides additional redundancy for communications and potential ability to improve early warning times in the unlikely event of a dam failure or incident.

City Light maintains and implements a robust Public Safety Plan at the Project, which includes the sirens and cellular hardware. City Light plans to install additional sirens and cellular hardware at other frequently populated areas or improve coverage to alert members of the public, non-Project personnel, and/or Project personnel to evacuate. Ideally, this effort is coupled with a public education campaign including information posted around publicly accessible sites in collaboration with partner agencies. The cellular coverage improvements to population centers further improve public safety by expanding access to 911 and allowing members of the public to receive emergency alerts on mobile devices.

To install a siren or cellular antenna, they must have a place to be mounted, with power, and communication infrastructure. Typically, a siren is mounted on a pole or other tall structure/building in a location that will provide audible warning for an extended distance. Also, the siren must have a reliable power supply and a communication link to City Light's communications infrastructure. Like sirens, cellular antennas need an appropriate structure for mounting to provide coverage and to be supplied with power and communications lines.

The following locations with low or no coverage are identified within the inundation zone and require additional siren and cellular infrastructure to improve public safety and early warning capabilities. However, this is not an exhaustive list of locations for the duration of the new license. Should other areas within the potential inundation area become populated or become a frequent site for recreation during the new license term, City Light may need to install or work with partner agencies to facilitate the installation of a siren and/or cellular coverage. These locations may include populated areas beyond the Project Boundary but within the potential inundation areas.

Colonial Creek Campgrounds: New Siren and Communication Infrastructure

NPS owns and operates two (north and south) campgrounds on the south side of Diablo Lake along the Thunder Creek tributary arm, divided by SR 20 at approximately mile marker 130. These campgrounds are typically completely full during peak recreation season. Should a failure or large uncontrolled release of water occur from Ross Dam, these campgrounds are potentially located within the inundation area. City Light proposes to work with the NPS to install a siren and a communication link from the south side of Diablo Lake. The siren would be pole-mounted and able to be heard throughout both campgrounds and the boat launch. City Light plans to collaborate with NPS to display information at the campgrounds to educate the public on the siren system.

For the communications link, City Light proposes to install a fiberoptic submarine communications cable that would require excavations at the north and south shores to adequately protect the cable from foot and boat traffic. From the shore, the cable could be buried or spanned aerially to the siren location and other locations as needed.

While other communications links may be feasible, such as line-of-sight devices, they are less reliable and have other drawbacks compared to a fiberoptic line. The submarine fiberoptic cable would be very reliable such as during times of dense fog or heavy rain/snow, and would allow for additional public safety improvements, including cellular coverage at the campgrounds. With the fiberoptic connection, the Park Ranger stationed at the campground could be provided with phone and high-speed internet access. The campground could also be provided with cellular and landline telephone coverage and/or wireless internet access to the public. These items would allow for improved 911 coverage and faster notification to first responders for emergencies at the campgrounds.

Gorge Bypass Reach: Three New Sirens

While public access to the Gorge bypass reach is prohibited with signage indicating such, City Light frequently observes members of the public recreating in the Gorge bypass reach area. City Light intends to cover this area with sirens to alert members of the public of a rapid increase in water flow (i.e., spill event) and dam failure evacuation siren.

The coverage is preliminarily proposed to be completed with three new sirens. The first proposed location is one at or near Gorge Dam or Gorge Dam Access Road, connected to existing electrical and communication infrastructure. The second proposed location is at or near the downstream end of SR 20 Highway Tunnel and the river crossing of City Light's 7-kV electrical lines, approximately midway between Gorge Dam and Powerhouse. The final location would be at or near the Gorge Powerhouse. The coverage of these three sirens would alert individuals in the Gorge bypass reach for significant changes in river flow and would also alert individuals along SR 20

should the siren be activated. For all three locations, electrical communication infrastructure is available in the vicinity and could easily be connected to the new siren with minimal impacts. Cellular coverage may also be added at or near these siren locations where not already available.

Dam Failure Evacuation Route Updates

City Light has identified the need to make adjustments to the current dam failure evacuation routes and establish additional routes around the Project. These changes will improve public and personnel safety in the unlikely event of a dam failure. In 2019, City Light collected a full inventory of public safety features and created a new Public Safety Plan for the Skagit River Project. As part of this project City Light found that many routes have insufficient or misplaced signage, including routes that do not continue to a high enough elevation to be out of the inundation zone. Additionally, there are very limited options for evacuees to reach safety quickly and new routes will help alleviate congestion on those routes and provide closer options for evacuees to access.

Relocated and added signage include:

- The Diablo vehicle evacuation route muster point along SR 20 will be relocated to Gorge Overlook. Both Gorge Overlook parking areas are outside of the inundation zone and provide improved parking and accessibility for evacuees. This will require moving the "SAFE FROM FLOODING AREA" sign from the transition tower on SR 20 to the Gorge Overlook parking lot. Additional signage may be added to the new muster point, if necessary.
- The current muster point for the Ladder Creek Falls pedestrian evacuation route is located at an elevation of 640 feet and is within the inundation zone. The new location is located north of the current muster point at an elevation of 740 feet. This new muster point will reestablish a trail that leads to the new location from either side of Ladder Creek Falls. This will require rebuilding the old trail that leads to the upper Ladder Creak Falls bridge, moving the "SAFE FROM FLOODING AREA" sign from the gate at the top of the current Ladder Creek Falls Trail to the new muster point, and posting additional signage leading evacuees up the route.
- The muster point for the Newhalem vehicle evacuation route is located within the inundation zone at an elevation of 640 feet. This point will be moved to an elevation of 840 feet, which will allow room above the inundation zone for multiple vehicles to park safely. This will require moving the "SAFE FROM FLOODING AREA" sign from its location at 640 feet to the new location with a new signpost at 840 feet.
- A new "FLOOD EVACUATION ROUTE" sign with arrow will be installed at the Diablo Lake Trail trailhead to guide evacuees from the boathouse and ELC parking area. This is an established evacuation route but is not properly signed to guide the public to safety.
- The existing "THIS AREA SAFE FROM FLOODING" sign on Diablo Lake Trail above the ELC is tied to a tree at the approximate muster point for that pedestrian evacuation route. This sign will be properly affixed to a permanent post at the appropriate muster point location.
- Currently there is no sign indicating the "FLOOD EVACUATION ROUTE" for pedestrian evacuees from Newhalem to proceed up the Trail of the Cedars. A new sign and arrow will be installed at the suspension bridge leading pedestrians to the evacuation route behind Newhalem powerhouse.

- There is no "FLOOD EVACUATION ROUTE" sign and arrow on the north side of SR 20 directing westbound drivers to turn left at the intersection of SR 20 and North Cascades National Park Visitor Center Road. A new sign and arrow will be installed at an appropriate location for that intersection.
- The "FLOOD EVACUATION ROUTE" sign located at the intersection of Newhalem Intake Road and North Cascades Visitor Center Road is covered by vegetation and will be moved closer to the road to provide better visibility of the sign for drivers.

New Evacuation Routes:

Two additional evacuation routes will be established, one for vehicle traffic and one for pedestrians.

- The new vehicle evacuation route will be along the Thornton Lakes Road and will provide an alternative for evacuees if the bridge to the Newhalem Intake Road is congested or blocked. This will require installing a "FLOOD EVACUATION ROUTE" sign and arrow along SR 20 signaling traffic up the Thornton Lakes Road and a "THIS AREA SAFE FROM FLOODING" sign installed at the appropriate elevation to allow multiple cars to park safely above the inundation zone. Other signage may be necessary to properly mark the evacuation route.
- The new pedestrian evacuation route will be established along the Diablo Dam Trail and will provide the town of Diablo and Diablo Powerhouse with a shorter, more direct route that leads to a suitable open muster location along the road to the old incline building. A "FLOOD EVACUATION ROUTE" sign with arrow will be installed at the bottom of the trail directing people to the intersection of the trail and the Old Incline Road. A "THIS AREA SAFE FROM FLOODING" sign will be installed at the end of the trail. Both locations have an existing post that the new signs can be affixed to.

3.1.5 Any Proposed Changes to the Operation of the Project that Might Affect the Existing Emergency Action Plan on File with the Commission

The Project's EAP is available at the City Light SOC dispatchers' console and at the control rooms of the Ross, Diablo, and Gorge powerhouses, and it is current with the most recent update issued December 2022 (City Light 2022g). Inundation mapping was current as of February 2013 for both the sunny day and Probable Maximum Flood (PMF) failure scenarios at each development individually. The PMF failure scenario is based on the peak inflow from a 100-year flood. The 2013 inundation mapping for the PMF failure scenario at Ross Dam involved a peak release at Newhalem (10.6 miles downstream of the Ross Development) of 10,009,000 cfs fifty minutes after the dam failure (Northwest Hydraulic Consultants 2013).

City Light is proposing the following modifications to Project operations: the Summer Variable Reservoir Operations Zone at Ross Lake; Modifications to Flood Risk Management Operations; Minimum Instream Flows in the Gorge Bypass Reach; and the release of Side and Off-Channel Connectivity and Process Flows as part of the Skagit River REP FMP (see Exhibit B, Section 5.4, of this FLA for additional details about the proposal).

The proposed changes to operations are not expected to impact the existing EAP.

3.1.6 Existing and Planned Monitoring Devices to Detect Structural Movements or Stress, Seepage, Uplift, Equipment Failure, or Water Conduit Failure, Including a Description of the Maintenance and Monitoring Programs Used or Planned in Conjunction with the Devices

The Project has implemented an Operator Surveillance Program, through which operators are trained to observe each of the principal Project features with a view toward detecting any change that might suggest unsatisfactory performance. Operators also are instructed to thoroughly inspect and check functionality of important systems, such as gate operability, following any felt earthquake or after a major flood. In addition, active instrumentation and measurements at all dams, unless otherwise noted, include:

- Headwater and tailwater elevation sensors;
- Precise survey of crest monuments (collimation);
- Drain flows measurement;
- Piezometers;
- Crack meters (at Diablo Dam only);
- Quarterly photographic documentation;
- Air temperature sensors (at Diablo Dam only); and
- Strong motion accelerometers (at Ross Dam only).

Of these, some are integrated into an evolving automated data acquisition system (ADAS), allowing for real-time monitoring of dam behavior. These instruments have a regular system of inspection, which is described in the Project's existing DSSMP (City Light 2022c, 2022d, and 2022e). In addition to completing routine planned maintenance and unplanned repairs on all instruments, City Light maintains safe access to monitoring locations and calibrates instruments per manufacturers' recommendations. Maintenance and calibration are also scheduled for instruments when erratic readings cannot be resolved with normal field trouble shooting.

It is likely that there will be necessary updates to and/or replacement of monitoring devices in the new license term.

3.1.7 The Project's Employee Safety and Public Safety Record, Including the Number of Lost-Time Accidents Involving Employees and the Record of Injury or Death to the Public Within the Project Boundary

3.1.7.1 Project Employee Safety Record

City Light has a rigorous worker safety program that includes providing employees with appropriate personal protective equipment (PPE) and training and conducting preventative maintenance of equipment and facilities. Additionally, City Light maintains and regularly reviews and updates its Public Safety Plan for the Skagit River Project. The Public Safety Plan identifies and evaluates the inherent hazards associated with operating hydropower facilities that are accessible to the public and documents the public safety devices installed in coordination with the NPS to mitigate these hazards. The Skagit Public Safety Plan was recently updated in December 2019.

Nonetheless, accidents and injuries do occur. These are recorded and tracked by City Light's Safety Division, with follow-up as needed to prevent reoccurrence. Over the last five years (2018-2022), there have been 19 accidents/injuries at the Project that resulted in lost work time. (Table 3.1-1). An additional 35 work-related, lost time accidents/injuries are documented in City Light's Safety Division reporting system for the seven years between 2011 and 2017.

Table 3.1-1. Record of employee accidents at the Skagit River Project resulting in lost work time (2018-2022).

Date	Reported Injury
05/05/2018	Lower back injury from putting away a piece of heavy-duty hydraulic conduit bender into its box.
09/11/2018	Eye injury from acid splash during routine battery maintenance at the Gorge Switchyard Substation Building.
01/23/2019	Injured back from pulling manhole covers to check flow to the Diablo Wastewater Treatment Plant.
04/22/2019	Hit and injured knee on edge of deck plate on top of Gen. 21.
06/18/2019	Over extended right knee from working in landscape bed.
12/04/2019	Rolled ankle walking down a flight of stairs.
03/03/2020	Eye irrigation from a small piece of aluminum that made its way behind safety glasses during filing work on aluminum conduit.
03/17/2020 (one accident, 3 staff injured)	Multiple injuries from boating accident on Diablo Lake; watercraft ran aground at speed while transporting staff to Ross Powerhouse.
03/17/2020	Multiple injuries from boating accident on Diablo Lake; watercraft ran aground at speed while transporting staff to Ross Powerhouse.
03/17/2020	Multiple injuries from boating accident on Diablo Lake; watercraft ran aground at speed while transporting staff to Ross Powerhouse.
12/16/2020	Wrist pain from work-related painting aggravated an old injury.
01/25/2021	Knee pain and pop while walking down a flight of stairs.
03/08/2021	Slip and fall on stairs.
06/28/2021	Sharp pain in abdomen and lower back strain from repeated lifting of hoses and equipment from back of vehicle and dragging irrigation hoses to place.
11/29/2021	Twisted knee from slip and fall while servicing unit 32 thrust bearing cooling water regulating valve.
02/26/2022	Jammed head into a bar in boat engine compartment resulting in sharp pains in neck and the back of head for several weeks.
03/22/2022	Respiratory illness possibly caused by entering the Diablo Powerhouse Surge Tank.

3.1.7.2 Record of Public Injuries and Deaths at the Project

The Project is within the Ross Lake National Recreation Area (RLNRA), and most public recreation facilities and activities are managed by the NPS. The NPS is responsible for safety at campgrounds and trails and for boating on the reservoirs and responds to accidents and other incidents involving injuries or missing persons. A major east-west highway, SR 20, runs through portions of the Project Boundary and is patrolled by NPS, Whatcom County sheriff officers, and the highway patrol. Accidents along the highway occur often and trained City Light personnel

from Newhalem and Diablo frequently assist as first responders. NPS responds to and tracks public safety incidents occurring in the RLNRA, some of which are within the Project Boundary. Table 3.1-2 provides the dates of the 97 injuries and deaths recorded for the five years between 2017 and 2021. Of the 11 recorded deaths, 6 were vehicle-related, most on SR 20. There were 27 injuries from vehicle accidents on SR 20, but most injuries occurred at NPS-managed recreation areas and facilities, including camp areas, overlooks and on trails. While none of the incidents listed in Table 3.1-2 was the result of Project operations, the NPS did respond to 12 injuries reported at City Light facilities.

City Light records, and reports to FERC, any incidents resulting in death or serious injury that occur at the Project developments or are associated with Project operations. City Light is unaware of deaths or serious injuries occurring within the Project Boundary over the last five to ten years.

Table 3.1-2. Summary of public injuries and deaths at the Skagit River Project (2017-2021).[1]

Date	Location	Reported Incident
2017		
1/9/2017	SR 20 milepost (MP) 113	Death
5/20/2017	Goodell Creek Trail	Injury
6/18/2017	Perry Creek	Injury
6/21/2017	SR 20 MP 135	Injury
7/1/2017	**Gorge Lake**	**Injury**
8/7/2017	SR 20 MP 146	Death
8/19/2017	SR 20 MP 127	Death
8/3/2017	Hozomeen	Injury
8/5/2017	SR 20 MP 133.5	Injury
8/6/2017	SR 20, Diablo Overlook	Injury
8/12/2017	Newhalem Campground Host Site	Injury
8/16/2017	Hozomeen	Injury
8/22/17	Pierce Creek Falls	Death
9/1/2017	**Ross Dam**	**Injury**
9/4/2017	SR 20 MP	Injury
9/6/2017	SR 20 MP 129	Injury
2018		
5/13/2018	SR 20 MP 127	Death
5/24/2018	SR 20 MP 124	Injury
5/26/2018	Thunder Creek	Injury
5/26/2018	Rainbow Point	Injury
5/26/2018	Colonial Creek Campground	Injury
5/31/2018	Pumpkin Mountain	Injury
6/3/2018	SR 20 MP 126	Injury
6/16/2018	Colonial Creek Campground	Death
6/20/2018	Devil's Boat-in Site	Injury
7/6/2018	Desolation Trail/Peak	Injury
7/6/2018	Panther Creek Trail	Injury

Date	Location	Reported Incident
7/9/2018	Hozomeen	Injury
7/12/2018	Redoubt Glacier/Mox Peak	Injury
7/14/2018	Roland Point	Injury
7/14/2018	**Newhalem Store**	**Injury**
7/14/2018	**Newhalem Store**	**Injury**
7/23/2018	Desolation Trail/Peak	Injury
7/23/2018	Hozomeen - Winnebago Flats Campground	Injury
7/23/2018	Hozomeen - Winnebago Flats Campground	Injury
7/26/2018	Ross Lake Resort	Injury
7/30/2018	Ruby Pasture	Injury
8/1/2018	Rainbow Point	Injury
8/9/2018	Desolation Trail	Injury
8/19/2018	SR 20 MP 132	Injury
8/20/2018	SR 20 MP 115	Injury
8/25/2018	Newhalem Visitor Center	Injury
8/31/2018	SR 20 MP 143	Injury
8/31/2018	SR 20 MP 143	Injury
2019		
4/30/2019	Colonial Creek Campground	Death
5/26/2019	Goodell Campground Area	Injury
5/20/2019	SR 20 MP 126	Injury
5/11/2019	SR 20 MP 130	Injury
6/9/2019	SR 20 MP 134	Injury
7/14/2019	**Ross Dam Trail/Haul Road**	**Injury**
08/09/2019	Newhalem Campground Kiosk	Injury
8/17/2019	Newhalem Campground Site 125	Injury
8/23/2019	SR 20 MP 123	Injury
8/31/2019	SR 20 MP124	Injury
9/7/2019	Newhalem Campground Site 70	Injury
9/7/2019	SR 20	Injury
2020		
5/26/2020	SR 20 MP135	Injury
5/28/2020	SR 20	Injury
5/29/2020	SR 20 MP147	Injury
7/5/2020	Hozomeen Mountain	Injury
7/5/2020	SR 20 MP 137	Injury
7/7/2020	Skagit River Adjacent to MP 115	Death
7/11/2020	Newhalem Visitor Center	Injury
7/11/2020	**Diablo Town**	**Injury**
7/18/2020	Diablo Overlook	Injury

Date	Location	Reported Incident
7/18/20	Thunder Knob Trail	Injury
7/19/2020	SR 20 MP 110	Injury
7/19/2020	SR 20 MP 121	Injury
7/25/2020	Ross Lake Resort	Injury
8/1/2020	Diablo Lake Trailhead	Injury
8/1/2020	**Environmental Learning Center**	**Injury**
8/17/2020	**Environmental Learning Center**	**Injury**
8/1/2020	Ross Lake Resort	Injury
8/1/2020	Ross Lake Resort	Injury
8/22/20	SR 20 MP 155	Injury
8/22/2020	SR 20 MP 155	Injury
8/23/2020	SR 20 MP 143	Injury
8/23/2020	SR 20 MP 146	Death
10/3/2020	**City Light Boat Launch**	**Injury**
10/8/2020	Thunder Knob	Death
2021		
1/13/2021	Thornton Lake Road	Death
3/13/2021	Diablo Overlook	Injury
5/14/2021	Hidden Hand	Injury
5/29/2021	Goodell Boat Launch	Injury
6/12/2021	Thunder Creek	Injury
6/15/2021	Diablo Overlook	Injury
6/18/2021	Colonial / SR 20	Injury
6/27/2021	**Diablo Boathouse**	**Injury**
6/29/2021	Ross Dam Trail	Injury
7/1/2021	Newhalem Visitor Center	Injury
7/6/2021	Thunder Knob	Injury
7/22/2021	SR 20 MP 129	Injury
7/25/2021	Lightning Creek Boat Camp	Injury
8/2/2021	Diablo Overlook	Injury
8/12/2021	**Newhalem, Ladder Creek Trail**	**Injury**
8/14/2021	**Newhalem Store**	**Injury**

1 Bold line items are incidents reported at City Light facilities.

3.2 Description of the Current Operation of the Project, Including any Constraints that Might Affect the Manner in which the Project is Operated

Ross Lake is the primary storage for the Project and is drawn down in winter to capture water from spring runoff and for downstream flood risk management. Ross Lake also provides instream flows to protect anadromous fishery resources downstream of the Gorge Powerhouse, recreation, and

hydropower generation. Reservoir operations include a number of compliance requirements that are outlined in detail in the current Project license and also described in Exhibit E of this FLA.

Diablo Lake provides generation flexibility and reregulates flows between the Ross and Gorge developments. The lake typically fluctuates 4-5 feet daily, although drawdowns of 10-12 feet occur occasionally as needed for construction projects or maintenance.

The main purpose of Gorge Lake is to regulate downstream flows for fish protection. Flows from the Gorge Development are critical for fish protection in the Skagit River. To comply with the license requirements that incorporate the Revised Fisheries Settlement Agreement (FSA; City Light 2011) Flow Plan, City Light operates Gorge Lake and Powerhouse in coordination with Ross and Diablo lakes to provide a continuous, stable flow regime in the upper Skagit River with minimum and maximum flows into the mainstem Skagit River downstream of Gorge Powerhouse as outlined in the FSA.

Flows in the mainstem Skagit River downstream of Gorge Powerhouse are defined in the current Project license issued by FERC in 1995,[3] which fully incorporated the measures included in the Flow Plan of the original FSA (City Light 1991). The intent of the Flow Plan was to minimize the effects of Project operations on salmon and steelhead. The Project license was amended in 2013[4] to incorporate a Revised Flow Plan (City Light 2011), which included four additional measures City Light had been implementing voluntarily since 1995 to further reduce Project effects on steelhead and salmon. The specific flow measures and ramping rate restrictions included in the current Project license as amended and Revised FSA Flow Plan (City Light 2011) are described in Exhibit B, Section 2.6, of this FLA.

Output from the Project is currently scheduled by staff at City Light's SOC and Power Management Division in Seattle on an hourly basis. The schedule seeks to provide peaking capacity as required by the system load and to optimize the use of the available water within the constraints of inflows, reservoir storage changes and pool level fluctuations, equipment operating limits, scheduled maintenance, and downstream discharge limits as required for flood risk mitigation and anadromous fish protection. Throughout any given day, short-term system load adjustments are made as necessary and as described above.

3.3 Discussion of the History of the Project and Record of Program to Upgrade the Operations and Maintenance of the Project

The history and chronology of development and construction of the original Project facilities are described in Exhibit C of this FLA. The record of subsequent major upgrades to the O&M of the Project is summarized in Table 3.3-1. Generators and other Project equipment undergo frequent inspections and routine maintenance and repairs.

[3] Order Accepting Settlement Agreement, Issuing New License and Terminating Proceeding, 71 FERC ¶ 61,159 (1995).

[4] Order Amending License and Revising Annual Charges, 144 FERC ¶ 62,044 (2013).

Table 3.3-1. Summary of upgrades to the operations and maintenance of the Skagit River Project.

	Ross Development	Diablo Development	Gorge Development
Generator rewinds / rehabilitation	2005 (Unit 42) 2006 (Unit 43) 2007 (Unit 44) 2009 (Unit 41)	2008 (Unit 36) 2018 (Unit 31) 2019 (Unit 32) 2021 (Unit 35)	1982 (Unit 21) 1982 (Unit 22) 1983 (Unit 23) 1990 (Unit 24)
Generator disassembly, inspection, repairs		2020 (Unit 34) 2022 (Unit 36)	
Turbine runner replacement	1996 (Unit 42) 1997 (Unit 43)	1994 (Unit 31) 1995 (Unit 32)	1990 (Unit 23) 1991 (Unit 22) 1992 (Unit 21) 2004 (Unit 24)
Transformer bank replacements	2016-2017	1995	2004-2005 2015
Powerhouse rockfall / landslide / erosion mitigation and abatement	2011-2014 – rock scaling, blasting, and bolting to stabilize cliff near powerhouse following a major slide in 2010; also involved rebuilding part of the road to the dam.	2009 and 2022 – scaling, bolting and installation of wire mesh to minimize rockfall from the cliff behind the powerhouse; also included repairs to powerhouse roof and back wall.	2009 – repairs to a washout of a portion of the crib wall at the tailrace for Unit 24.
Dam electrical upgrades	2022-2024 – upgrades to electrical and communication infrastructure in the tunnel between the powerhouse and dam (Ongoing)		

3.4 Summary of Any Generation Lost at the Project Since 2017 Because of Unscheduled Outages, Including the Cause, Duration, and Corrective Actions Taken

City Light's comprehensive maintenance program has allowed the Project to operate with relatively little lost generation during the current license term. A summary of all unplanned outages that have occurred at the Project over the last five years is provided in Table 3.4-1. A summary of percentage plant availability for the period 2017-2021 is shown in Table 3.4-2.

Table 3.4-1. Unplanned outages at the Skagit River Project for the period 2017-2021 that resulted in lost power generation.

Date(s)		Development / Unit	Duration (units-hours)	MWh Loss	Comment
Start	End				
1/15/2017 10:47	1/15/2017 11:14	Gorge, Unit 24	0.450	36.0	Relay crew tripped unit installing a test block that was connected to test equipment
1/25/2017 4:44	1/25/2017 6:43	Ross, Unit 44	1.983	223.1	Unit was run above its max load, at low head causing tunnel surge and trip off line

Date(s)		Development / Unit	Duration (units-hours)	MWh Loss	Comment
Start	End				
3/8/2017 15:35	3/8/2017 15:47	Diablo, Unit 36	0.200	0.2	Personnel working on Gen 35 tripped Gen 36 Exciter
3/13/2017 19:52	3/14/2017 14:59	Ross, Unit 41	19.117	1,806.5	Exciter field ground alarm. Constructors found 2 (out of 3) Failed Metal Oxide Varistor
5/2/2017 14:53	5/2/2017 19:11	Gorge, Unit 24	4.300	344.0	Brushes worn down earlier than expected, needed to be replaced immediately
5/12/2017 16:21	5/12/2017 19:12	Diablo, Unit 32	2.850	236.6	Exciter backup core fault codes 495 & 711. GE rep left pt wires disconnected.
6/6/2017 11:23	6/6/2017 14:17	Ross, Unit 43	2.900	326.3	Governor no load speed too low for synchronizer to close breaker before timing out
6/22/2017 21:25	6/23/2017 15:40	Gorge, Unit 24	18.250	1,460.0	Failed gov. card caused loss of wicket gate control, replaced the bad card
6/28/2017 12:56	6/28/2017 14:08	Ross, Unit 44	1.200	135.0	Shear pin # 9 Cracked --- Replaced with new.
7/20/2017 11:15	7/20/2017 18:35	Diablo, Unit 32	7.333	608.7	DCFB exciter control power supply card failure.
8/22/2017 12:01	8/22/2017 13:55	Gorge, Unit 21	1.900	60.8	Wickets failed to close all the way unit started to over speed, closed TSV to stop it
8/31/2017 6:06	8/31/2017 10:09	Gorge, Unit 21	4.050	129.6	Wicket gates failed to close all the way and unit timed out on stop and tripped 86M
9/8/2017 10:51	9/8/2017 12:36	Ross, Unit 43	1.750	196.9	Stop Cycle Initiated from induced voltage to PLC input. Corrected, unit back on line.
11/13/2017 4:00	11/13/2017 9:29	Ross, Unit 44	5.483	616.9	Shear Pin # 9 Cracked
11/20/2017 11:33	11/21/2017 13:02	Diablo, Unit 35	25.483	30.6	Exciter Field ground due to carbon buildup in slip ring area.
11/22/2017 8:39	12/1/2017 13:18	Ross, Unit 44	220.650	24,823.1	Gen 44 Shut down as RS, during shutdown Exciter would not Shut Down (Stop)
11/30/2017 7:53	11/30/2017 8:00	Ross, Unit 43	0.117	13.1	Machinist Specialist started work on running unit without checking with Operator.
12/4/2017 7:20	12/4/2017 15:23	Gorge, Unit 21	8.050	257.6	stator slot 53 rtd failed and was bypassed
12/7/2017 10:10	12/7/2017 15:35	Ross, Unit 44	5.417	609.4	Governor operating erratically suspect mechanical and electrical problem
12/14/2017 13:53	12/14/2017 18:33	Diablo, Unit 35	4.67	5.6	Speed Signal Generator brush failure
1/10/2018 13:40	1/26/2018 11:57	Ross, Unit 42	382.28	43,006.9	Downstream shift ring crack repaired. Governor Mech/Elect tune-up performed.
1/21/2018 8:22	1/22/2018 15:57	Diablo, Unit 32	31.58	2,621.4	Unit 31 oil spill; unit 32 offline to reduce tailrace water and sump inflows

Date(s)		Development / Unit	Duration (units-hours)	MWh Loss	Comment
Start	End				
1/21/2018 8:40	1/22/2018 10:53	Diablo, Unit 36	26.22	31.5	Oil spill unit 31; reduced load on unit 36 to reduce tailrace water and sump inflows
1/21/2018 9:07	1/22/2018 10:53	Diablo, Unit 35	25.77	30.9	Unit 31 oil spill; unit 35 offline to reduce tailrace water and sump inflows
1/26/2018 12:54	1/26/2018 13:28	Ross, Unit 42	0.57	63.8	Shutdown for minor governor adj to assure remote start capability
3/12/2018 5:12	3/12/2018 7:50	Ross, Unit 44	2.63	296.3	Stuffing box low flow trip
3/12/2018 14:03	3/12/2018 16:01	Ross, Unit 44	1.97	221.3	Stuffing box low flow trip
3/13/2018 3:36	3/13/2018 5:10	Ross, Unit 44	1.57	176.3	Stuffing box low flow trip
3/16/2018 8:35	3/16/2018 16:23	Gorge, Unit 22	7.80	249.6	Wickets 2+3 sheared on shut down, manually tripped breaker
3/19/2018 0:40	3/19/2018 2:07	Ross, Unit 44	1.45	163.1	Stuffing box low flow trip
3/24/2018 16:56	3/24/2018 19:45	Ross, Unit 42	2.82	316.9	Shear pin 13 alarmed and the unit was taken off-line and the shear pin replaced
3/30/2018 18:23	3/30/2018 20:43	Diablo, Unit 35	2.33	2.8	Reduced tailrace water for divers to release tangled stop log cables
3/30/2018 18:24	3/30/2018 20:53	Diablo, Unit 36	2.48	3.0	Reduced tailrace water for divers to release tangled stop log cables
3/30/2018 18:52	3/30/2018 20:25	Diablo, Unit 32	1.55	128.7	Reduced tailrace water for divers to release tangled stop log cables
4/6/2018 16:17	4/6/2018 16:35	Diablo, Unit 31	0.30	27.0	Unplanned 86M trip packing box water low pressure
4/9/2018 8:40	4/9/2018 17:05	Diablo, Unit 35	8.42	10.1	Field ground alarm; exciter brushes and commutator dirty and in need of cleaning
4/25/2018 11:09	4/25/2018 11:14	Gorge, Unit 22	0.08	2.7	Lube oil 43 switch aux contacts for start permissive indication failed.
5/30/2018 8:19	5/30/2018 15:13	Gorge, Unit 22	6.90	220.8	A mounting bolt for the pos. slip ring brush holder assy. was found to be running hot
6/15/2018 14:52	6/15/2018 16:38	Diablo, Unit 31	1.77	159.0	Turbine bearing lubricating oil leak
6/20/2018 16:00	6/20/2018 16:45	Ross, Unit 41	0.75	84.4	Lightning
6/20/2018 16:00	6/20/2018 16:42	Ross, Unit 42	0.70	78.8	Lightning
6/20/2018 16:00	6/20/2018 16:22	Ross, Unit 43	0.37	41.3	Lightning
7/4/2018 10:15	1/1/2019 0:00	Gorge, Unit 20	4333.75	9,969.9	At full load BK20 core temp 230C = 60C over Max temp 170C. Inadequate cooling system
7/10/2018 12:15	7/10/2018 15:39	Diablo, Unit 36	3.40	4.1	Inspection of commutator and brushes for abnormal wear

Date(s)		Development / Unit	Duration (units-hours)	MWh Loss	Comment
Start	End				
7/20/2018 16:01	7/20/2018 18:01	Gorge, Unit 22	2.00	64.0	Main cooling water valve failed to show open in the start permissive string
7/21/2018 9:37	7/21/2018 13:48	Gorge, Unit 22	4.18	133.9	Lower slip ring has too much runout, stopped to check
7/27/2018 19:15	8/7/2018 14:56	Ross, Unit 42	259.68	29,214.4	TB Metal High Temp during shutdown, awaiting oil sample results unit under KEEP OPEN
8/16/2018 17:11	1/1/2019 0:00	Gorge, Unit 22	3294.82	105,466.1	Metal slag clogged Lube Oil Line, wiped Thrust Bearing
8/22/2018 7:58	8/22/2018 8:02	Gorge, Unit 21	0.07	2.1	Inadvertent trip of generator while changing out exciter vent filters
9/29/2018 6:53	9/29/2018 11:01	Gorge, Unit 23	4.13	132.3	Replaced Short commutator brushes
10/3/2018 18:38	10/3/2018 19:05	Ross, Unit 44	0.45	50.6	Tunnel surge caused machine outage >relay-initiated shutdown. Unit restored quickly.
10/4/2018 7:47	10/4/2018 10:18	Ross, Unit 42	2.52	283.1	carbon deposits in brush rigging area causing high chance of repeated field ground
11/4/2018 10:38	11/4/2018 11:26	Ross, Unit 43	0.80	90.0	Dispatcher hit shutdown button; system restored
11/4/2018 13:12	11/4/2018 16:33	Diablo, Unit 31	3.35	301.5	Loss of Bentley automation monitoring of generator
11/5/2018 13:10	11/5/2018 15:17	Gorge, Unit 23	2.12	67.7	The cooling water flow switch did not make up causing a start fail started in hand
11/17/2018 9:57	11/17/2018 12:18	Ross, Unit 42	2.35	264.4	Low oil level Gov oil sump shutdown, oil level restored and unit back on-line
11/29/2018 14:28	11/29/2018 15:23	Ross, Unit 44	0.92	103.1	Replace Broken Shearpin # 9
12/7/2018 10:24	12/7/2018 13:49	Gorge, Unit 21	3.42	109.3	The gov. was not following the set point; had to replace a card in the gov.
1/1/2019 0:00	1/1/2020 0:00	Gorge, Unit 20	8760.00	20,148.0	At full load BK20 core temp 230C = 60C over Max temp 170C. Inadequate cooling system
1/1/2019 0:00	5/23/2019 18:37	Gorge, Unit 22	3426.62	109,619.7	Metal slag clogged Lube Oil Line, wiped Thrust Bearing
1/24/2019 10:17	1/24/2019 14:58	Gorge, Unit 23	4.68	149.9	Unit forced out to change out short exciter commutator brushes
2/19/2019 6:45	3/1/2019 15:17	Diablo, Unit 36	248.53	298.2	Exciter ground due to carbon/oil buildup. Unit Shutdown for cleaning and inspection.
2/19/2019 14:39	2/19/2019 14:53	Ross, Unit 42	0.23	26.3	Relay Crew needed unit offline to safely lift wires for testing Gen 41
2/22/2019 9:38	2/22/2019 13:43	Gorge, Unit 24	4.08	396.1	Forced out to change out short commutator brushes

Date(s)		Development / Unit	Duration (units-hours)	MWh Loss	Comment
Start	End				
2/22/2019 14:08	2/22/2019 14:24	Ross, Unit 42	0.27	30.0	Relay Crew needed unit offline to safely replace wires after testing Gen 41
3/18/2019 12:07	3/19/2019 15:35	Ross, Unit 43	27.47	3,090.0	Restoring linkage cable snapped
3/20/2019 10:09	3/20/2019 10:18	Ross, Unit 43	0.15	16.9	Relay Crew needed unit 43 offline to safely replace wires after testing Gen 44
5/23/2019 19:19	6/12/2019 9:22	Gorge, Unit 22	470.05	0.0	Testing and heat run in on the new thrust bearing
5/25/2019 10:43	5/25/2019 14:10	Ross, Unit 43	3.45	388.1	Shaft packing low flow trip
6/30/2019 17:11	6/30/2019 19:18	Diablo, Unit 32	2.12	190.5	Insufficient packing box pressure/flow tripped the 86M. Pressure/flow/unit restored
7/9/2019 23:42	7/10/2019 9:10	Ross, Unit 41	9.47	1,065.0	Shear Pin 22 alarm
8/3/2019 10:47	8/3/2019 12:56	Gorge, Unit 22	2.15	68.8	Gate 2 sheared on shut down.
8/13/2019 13:59	8/13/2019 14:09	Gorge, Unit 23	0.17	5.3	Had to shut down to replace plugged lube oil sump heat exchanger cooling water line
8/18/2019 19:28	8/18/2019 21:40	Diablo, Unit 32	2.20	198.0	Packing box low cooling water flow. 86M trip
8/19/2019 13:02	8/19/2019 13:20	Gorge, Unit 22	0.30	9.6	Tripped off line by improper switching of bkr 7 bk 10
8/19/2019 13:02	8/19/2019 13:21	Gorge, Unit 23	0.32	10.1	Caused by improper operation of bkr 7 bk 10
9/1/2019 0:16	9/1/2019 2:26	Gorge, Unit 22	2.17	69.3	Auto synch would not raise voltage so it timed out on incomplete synch
9/11/2019 16:02	9/12/2019 14:41	Diablo, Unit 32	22.65	2,038.5	Installed packing incorrect and caused erratic flow and indications, replaced with correct
12/20/2019 1:31	12/20/2019 6:20	Ross, Unit 41	4.82	541.9	Wet snow fall from tree through the line.
12/20/2019 1:32	12/20/2019 9:45	Diablo, Unit 32	8.22	739.5	Snows/rain = tree into 26KV line = trip = loss of DPH station power & auxiliaries = S/D U32
12/22/2019 9:39	1/1/2020 0:00	Gorge, Unit 21	230.35	7,371.2	Thrust bearing oil cooler leaking water into the oil
12/22/2019 12:59	12/24/2019 16:11	Gorge, Unit 22	51.20	1,638.4	Required to shut down due to oil leak on gen 21
12/22/2019 13:06	12/24/2019 16:11	Gorge, Unit 23	51.08	1,634.7	Required to shut down due to oil leak on gen 21
1/1/2020 0:00	1/1/2021 0:00	Gorge, Unit 20	8784.00	20,203.2	At full load BK20 core temp 230C = 60C over Max temp 170C. Inadequate cooling system

Date(s)		Development / Unit	Duration (units-hours)	MWh Loss	Comment
Start	End				
1/1/2020 0:00	1/22/2020 15:33	Gorge, Unit 21	519.55	16,625.6	Thrust bearing oil cooler leaking water into the oil
1/5/2020 8:30	3/24/2020 12:47	Gorge, Unit 22	1900.28	60,777.1	Unit would not load up due to wicket gate binding
1/23/2020 22:54	1/24/2020 13:07	Gorge, Unit 21	14.22	454.9	Failed to synch due to the brakes not dropping
1/24/2020 13:07	1/27/2020 10:27	Gorge, Unit 21	69.33	2,218.7	Failed to synch. due to wicket gate not closing
1/27/2020 10:27	1/27/2020 13:45	Gorge, Unit 21	3.30	105.6	Failed to synch. due to wicket gate not closing
1/29/2020 13:47	1/30/2020 14:24	Gorge, Unit 21	24.62	787.7	Speed signal generator drive plate miss alignment
1/30/2020 14:42	1/31/2020 15:15	Gorge, Unit 21	24.55	785.6	Speed signal generator drive plate still has a lot of runout
2/13/2020 6:53	2/13/2020 7:06	Ross, Unit 44	0.22	24.4	Low packing box water flow
3/12/2020 13:13	3/12/2020 13:22	Diablo, Unit 36	0.15	0.2	Voltage regulator was switched from auto to manual control.
3/23/2020 12:59	3/23/2020 16:31	Ross, Unit 44	3.53	397.5	The duplex strainer was plugged and could not be cleaned with the unit online
5/3/2020 15:58	5/3/2020 18:34	Ross, Unit 44	2.60	292.5	Cooling water strainers plugged with debris.
5/4/2020 16:17	5/5/2020 9:01	Ross, Unit 43	16.73	1,882.5	Brakes failed to engage
5/7/2020 11:03	5/7/2020 11:38	Ross, Unit 44	0.58	65.6	Cooling water strainers plugged with debris.
5/26/2020 23:59	6/2/2020 9:41	Ross, Unit 42	153.70	17,291.3	Governor shutdown solinoid rapidly dropping out and picking up; SOC unstable load.
6/17/2020 11:20	6/18/2020 8:55	Gorge, Unit 24	21.58	2,093.6	Shear pins 4,7,8 were found to be leaking and were changed out
6/18/2020 9:22	6/18/2020 13:45	Gorge, Unit 21	4.38	140.3	Friction plate # 7 sheared and needed to be reset
6/24/2020 9:46	6/25/2020 11:21	Ross, Unit 44	25.58	2,878.1	Governor oil high. Governor accumulator blowdown not functioning.
6/25/2020 21:21	6/25/2020 23:18	Ross, Unit 41	1.95	219.4	B/o 38v/15v power supply
7/2/2020 14:47	7/20/2020 6:00	Gorge, Unit 21	423.22	13,542.9	Oil leaking out of the guide bearings into the air housing and turbine pit
7/4/2020 4:44	7/6/2020 10:08	Ross, Unit 41	53.40	6,007.5	Found problem to be Joint voltage Controller
7/4/2020 4:44	7/6/2020 9:45	Ross, Unit 43	53.02	5,964.4	Found problem to be Joint voltage Controller
7/4/2020 4:45	7/6/2020 10:31	Ross, Unit 42	53.77	6,048.8	Found problem to be Joint voltage Controller

Date(s)		Development / Unit	Duration (units-hours)	MWh Loss	Comment
Start	End				
7/4/2020 4:45	7/6/2020 11:37	Ross, Unit 44	54.87	6,172.5	Found problem to be Joint voltage Controller
7/9/2020 17:08	7/9/2020 18:47	Diablo, Unit 32	1.65	148.5	Shutdown solenoid dropped out causing it to drop to -5MW
7/9/2020 19:46	7/9/2020 22:13	Diablo, Unit 32	2.45	220.5	Shutdown solenoid dropped out causing it to drop to -5MW
7/9/2020 22:39	7/13/2020 9:52	Diablo, Unit 32	83.22	7,489.5	Shutdown solenoid dropped out causing it to drop to -5MW
7/11/2020 6:50	7/11/2020 14:59	Ross, Unit 41	8.15	916.9	Governor control power supply trouble
7/13/2020 11:59	7/13/2020 14:42	Ross, Unit 41	2.72	305.6	Governor control power supply trouble (yes once again)
7/21/2020 15:55	7/29/2020 10:00	Ross, Unit 42	186.08	20,934.4	Excessive Vibration
7/28/2020 13:28	7/28/2020 13:55	Ross, Unit 44	0.45	50.6	During air injection testing unit tripped due to excessive vibration.
7/31/2020 15:15	9/10/2020 10:14	Gorge, Unit 21	978.98	31,327.5	Oil still leaking out of the guide bearings
9/11/2020 7:18	10/5/2020 8:42	Gorge, Unit 21	577.40	18,476.8	Oil leaking from the bearings
9/30/2020 17:08	9/30/2020 18:31	Diablo, Unit 32	1.38	124.5	False start, synchronizer out of calibration.
10/5/2020 9:54	12/8/2020 8:52	Gorge, Unit 21	1534.97	49,150.9	Shut down due to oil leak
11/16/2020 10:03	11/16/2020 12:34	Diablo, Unit 31	2.52	226.5	Replaced exciter cooling fan motor that was failing on #2 bridge. Bearing failure.
11/18/2020 8:48	11/18/2020 11:47	Gorge, Unit 24	2.98	289.4	The duplex strainer for the cooling water was plugged and stuck
12/4/2020 22:11	12/5/2020 0:54	Gorge, Unit 22	2.72	86.9	Friction plate miss alignment on #4
12/14/2020 14:26	12/14/2020 18:18	Diablo, Unit 31	3.87	348.0	Governor failed to open wicket gates in auto start.
1/1/2021 0:00	1/1/2022 0:00	Gorge, Unit 20	8,760.00	20,148.0	At full load BK20 core temp 230C = 60C over Max temp 170C. Inadequate cooling system
1/13/2021 5:41	1/13/2021 14:24	Ross, Unit 43	8.72	980.6	Windstorm caused R-1 to Trip
1/13/2021 5:41	1/13/2021 13:49	Ross, Unit 44	8.13	915.0	Windstorm caused R-1 to Trip
1/13/2021 7:34	1/13/2021 14:02	Ross, Unit 42	6.47	727.5	Windstorm caused R-2 to Trip
1/28/2021 12:45	1/28/2021 13:09	Diablo, Unit 36	0.40	0.5	Tripped due to 2-way radio being used to close to the temperature monitor.
2/3/2021 20:56	2/4/2021 9:13	Diablo, Unit 35	12.28	14.7	Vibration sensor failed on turbine guide bearing

Date(s)		Development / Unit	Duration (units-hours)	MWh Loss	Comment
Start	End				
3/22/2021 8:33	3/22/2021 9:04	Ross, Unit 44	0.52	58.1	Unit 44 tripped: low packing box flow: stuck flow switch. System adjusted and restored
3/28/2021 10:07	3/28/2021 15:59	Ross, Unit 44	5.87	660.0	Use of radio caused card failure
4/6/2021 12:05	4/7/2021 10:32	Ross, Unit 42	22.45	2,525.6	Communication between PLC and HMI has failed
4/23/2021 15:08	4/23/2021 15:50	Ross, Unit 41	0.70	78.8	Upper guide bearing high temp, 86M relay actuated
5/22/2021 10:00	5/24/2021 11:00	Diablo, Unit 31	49.00	4,410.0	Generator packing water low flow
5/24/2021 17:13	5/26/2021 9:19	Diablo, Unit 31	40.10	3,609.0	Gen 31 packing box water low flow
5/27/2021 14:37	5/27/2021 15:38	Diablo, Unit 32	1.02	91.5	Fire protection system technician (outside vendor) bumped relay inside fire protection
6/2/2021 22:25	6/7/2021 14:03	Diablo, Unit 31	111.63	10,047.0	Gen 31 packing box water low flow
6/11/2021 14:10	6/11/2021 16:22	Diablo, Unit 31	2.20	198.0	Power supply failure indication, possible bad connection in cable plug
6/12/2021 7:57	6/14/2021 15:32	Diablo, Unit 31	55.58	5,002.5	Low packing box flow, Seal misaligned.
6/22/2021 17:18	6/24/2021 13:02	Diablo, Unit 36	43.73	52.5	Governor oil low level trip. Stuck blowdown solenoid.
6/25/2021 14:53	6/25/2021 15:16	Gorge, Unit 24	0.38	37.2	Unit tripped due to high exciter air temp
6/27/2021 14:51	6/27/2021 22:47	Diablo, Unit 31	7.93	714.0	BKR 240-30 C Phase to ground internal fault. Lost SF6 gas
6/27/2021 14:51	6/27/2021 16:31	Gorge, Unit 22	1.67	53.3	C phase fault to ground on GO-NM line caused unit to trip
6/27/2021 14:51	6/27/2021 16:11	Gorge, Unit 23	1.33	42.7	C phase fault to ground on GO-NM line caused unit to trip
6/27/2021 14:51	6/27/2021 15:26	Gorge, Unit 24	0.58	56.6	C phase fault to ground on GO-NM line caused unit to trip
6/27/2021 14:51	6/27/2021 16:20	Ross, Unit 41	1.48	166.9	Diablo Bkr 240-30 phase - ground fault caused R2 transfer trip of Bkr 13 Gen 41
8/1/2021 23:52	8/2/2021 0:40	Gorge, Unit 22	0.80	25.6	Unit failed to start due to not meeting the start permissives
8/21/2021 9:06	9/27/2021 13:27	Gorge, Unit 22	892.35	28,555.2	Found water in the lube oil system unit taken off-line ASAP
10/6/2021 10:02	10/6/2021 13:46	Gorge, Unit 21	3.73	119.5	Shear on #4 on start up
10/7/2021 2:01	10/14/2021 9:56	Diablo, Unit 31	175.92	15,832.5	Slip ring brushes failed and damaged the slipring.
10/14/2021 10:43	10/14/2021 16:38	Diablo, Unit 32	5.92	532.5	Failing slipring brushes and brush holders

Date(s)		Development / Unit	Duration (units-hours)	MWh Loss	Comment
Start	End				
10/28/2021 14:30	11/1/2021 14:43	Diablo, Unit 32	96.22	8,659.5	Rockfall damaged powerhouse, rain water runoff infiltrate building
10/28/2021 14:42	11/1/2021 14:31	Diablo, Unit 31	95.82	8,623.5	Rockfall damaged powerhouse, rain water runoff infiltrate building
10/28/2021 15:36	11/28/2021 8:26	Diablo, Unit 36	736.83	885.4	Rockfall damaged powerhouse, rain water runoff infiltrate building
11/4/2021 19:03	11/8/2021 11:00	Ross, Unit 44	87.95	10,006.9	Testing incomplete will resume 11/08/21 Testing completed 1100 - Reserve shutdown
11/30/2021 15:28	12/1/2021 7:45	Ross, Unit 43	16.28	1,831.9	Testing incomplete resume 12/1/21 Testing Completed 12/1/21 1331 - Reserve Shutdown
12/1/2021 7:43	12/1/2021 9:34	Ross, Unit 41	1.85	208.1	Bad trip relay in governor control cabinet, relay replaced unit restored
12/27/2021 0:02	12/27/2021 7:50	Ross, Unit 43	7.80	877.5	Bearing cooling water failure alarm and Gen 43 actuator oil press low alarm
12/27/2021 0:02	12/27/2021 7:44	Ross, Unit 44	7.70	866.3	Bearing cooling water failure alarm and sync incomplete sequence alarm
12/29/2021 11:16	12/29/2021 12:17	Diablo, Unit 36	1.02	1.2	Upper guide bearing oil leak

Table 3.4-2. Summary of percentage plant availability for the Skagit River Project, 2017-2021.

Year	Percent
2017	81.3
2018	82.5
2019	85.4
2020	79.7
2021	81.9

3.5 Record of Compliance with the Terms and Conditions of the Current License

FERC's Division of Dam Safety and Inspection (D2SI) regional office, located in Portland, Oregon, conducts an annual operation inspection with City Light's Dam Safety engineers and Project personnel. In addition, a Part 12 Independent Consultant Safety Inspection is also mandated every five years. The last Part 12 inspection was performed on August 2022, concurrently with the latest FERC annual operations inspection and followed by a series of comprehensive Potential Failure Modes Analysis (PFMA) and Level 2 Risk Analysis (L2RA) workshops held on September through December 2021. The 2022 Part 12 Safety Inspection Report presented the results of the twelfth five-year inspection in compliance with Part 12, Subpart D of FERC's regulations (HDR 2022a, 2022b, 2022c).

The field inspection and subsequent evaluations found that the dams, appurtenant structures, and power plants were in satisfactory condition, adequately maintained and operated, and capable of performing with adequate margins of safety over the range of conditions that can be reasonably expected. No problems were noted that required immediate action.

To address recommendations made within the 2022 Part 12 Safety Inspection Report (HDR 2022a, 2022b, and 2022c), City Light has developed a risk-informed plan and schedule encompassing a range of activities from performing engineering studies, additional dam safety surveillance and monitoring, to O&M and capital improvement projects (CIP).

Other inspections required by FERC D2SI have also been conducted in response to specific and unique events, such as the 2017 spillway focused inspections at the three Skagit dams in response to the Oroville Dam spillway failure in California.

EAP Functional and Tabletop Exercises are conducted every five years, as are complete EAP reprints that encompass all revisions and updates made during this time. The Skagit EAP Functional exercise was recently performed in 2021 and the EAP document was reprinted in 2022.

City Light is aware of no compliance violations or recurring non-compliance incidents under the current Project license. City Light has self-reported to FERC, agencies, and tribes the following deviations from license conditions:

August 19, 1997 – Lower than minimum flows, excessive down ramping, and amplitude fluctuations. This incident occurred during a transition from planned spill to generation at Gorge Development that was complicated by difficulties loading Unit 24. Formal letter report to the agencies, tribes, and FERC on August 29, 1997, followed by After-Action Report on September 9, 1997 that detailed future preventative actions.

August 10, 2013 – Dewatering event downstream of Gorge Powerhouse. This event occurred during a severe and prolonged lightning storm that disabled all communications and control systems at Gorge Powerhouse, caused the generators to shut down, and damaged the USGS stream gage at Newhalem. It is believed that flow was completely interrupted at the powerhouse and fell below the required August minimum of 2,000 cfs for at least 90 minutes. This incident, well outside City Light's control, was formally reported to FERC, agencies, and tribes on August 16, 2013; an After-Action Report was filed on September 26, 2013.

There have been two years (2015 and 2019) when City Light was unable to fill Ross Lake by July 31 and maintain normal maximum water surface elevation through Labor Day. These events were due to inadequate runoff and the need to maintain anadromous fish protection flows downstream of the Project. The license allows for low water surface elevation under these circumstances, among others. City Light informed FERC and worked with NPS to mitigate impacts on recreation.

Skagit Tours – The Skagit Tours have been cancelled in four years: 2002 for security reasons following the events of September 11, 2001; 2010 for budgetary reasons; 2020 in compliance with state and federal COVID-19 protocols; and 2022 due to construction on SR 20 and staffing constraints. City Light notified FERC and NPS in each year this occurred. In 2020 and 2022 City Light developed alternative programs, including on-line videos in 2020 and extra ferry runs on Diablo Lake in 2022 with a tour guide to provide narration.

A review of compliance with the license articles and associated Settlement Agreement elements is provided in Table 3.5-1.

Table 3.5-1. License compliance summary.

Article	Article Summary and Compliance Status
201	Pay annual fees. Article revised by the July 17, 2013 Order Amending the License and Revising Annual Charges and subsequently, by February 2, 2021 Order Amending License, Approving Revised Exhibits K and M, and Revising Annual Charges. Ongoing – Paid annually.
202	Grant permission for certain types of use and occupancy of Project lands and waters and to convey certain types of use and occupancy. Continuing – Occurs rarely as Project is nearly all on federal land.
301	Maintain storage requirements and flood control operations for Ross Reservoir. Ongoing – Meet annual flood control storage of 60,000 acre-feet by November 15 and 120,000 acre-feet by December 1.
302	Comply with requests for flood control operational changes by USACE. Ongoing – Upon request.
303	File Exhibit M, Project as-builts, with FERC within 90 days of license issuance. Complete – Filed as scheduled (see FERC Order, July 23, 1997).
401	File a Project Fishery Resources Plan within 180 days of license issuance. Complete – Filed as scheduled (see FERC Order, July 30, 1996) and revised in 2014 (see FERC Order, April 24, 2014).
402	Host an annual meeting of agencies, tribes, interested parties, and FERC staff. Ongoing – Annual meetings of agencies, tribes, and interested parties took place through 2004. FERC staff did not participate and agency/tribal involvement was limited. Beginning in 2005, meetings are held at least annually with interested agencies and tribes for the fisheries, wildlife, and cultural resources programs. Coordination, but not formal meetings, occurs annually with NPS and the U.S. Forest Service (USFS) for the recreation program and with NPS for the erosion program.
403	Fill Ross Lake as early and as full as possible after April 15; achieve full pool by July 31 and maintain through Labor Day. Ongoing – Ross typically fills in early July. Unable to maintain pool in 2015 and fill in 2019 due to inadequate run off and fish protection requirements.
404	Maintain flows for protecting anadromous fish resources in the mainstem river downstream of Gorge Powerhouse. Ongoing – Monitoring, tracking, and compliance.
405	Release water from the Gorge Development to provide suitable habitat conditions for salmon and steelhead in the river during years or seasons of exceptionally low flows. Ongoing – When needed.

Article	Article Summary and Compliance Status
406	File Project power planning reports and scheduling procedures. Report malfunctions of instruments affecting fish flow requirements for a period longer than 24 hours immediately to the FSA signatories and within 10 days to FERC. Ongoing – Power planning and scheduling reports supplied monthly to the fisheries agencies and tribes. Instrument malfunctions reported as needed.
407	Verify the Effective Spawning Habitat Model and the Temperature Unit; conduct compliance monitoring; and file semi-annual flow reports. Complete – Effective Spawning Habitat Model and temperature unit verification. Ongoing – Compliance monitoring and semi-annual flow reporting ongoing.
408	Implement non-flow measures identified in FSA Section 7 to address residual impacts and habitat losses for fishery resources due to operation of the Project. File an annual report for each non-flow program. Complete – Off-channel chum habitat development; Newhalem and County Line ponds habitat improvements; and sediment reduction in tributaries to Skagit and Sauk rivers. Ongoing – Chinook research; off-channel habitat maintenance; resident trout production; tributary barrier removal; and annual reporting. Steelhead smolt production funds reprogrammed, with Non-flow Coordinating Committee (NCC) approval, to steelhead and Chinook research (letter to FERC March 7, 2002).
409	File a Project Soil Erosion Control Plan with FERC within 180 days of license issuance. Implement plan for the 37 project-related recreation sites and 18 project-related roads. Complete – Erosion Control Plan filed as scheduled (see FERC Order, May 15, 1996) and amended in 1997 and 1998. Erosion control at the originally identified sites. Ongoing – Erosion control measures at newly identified project-related recreation sites and roads; plant propagation; seed collection and greenhouse maintenance; and erosion site monitoring.
410	File a Wildlife Habitat Protection and Management Plan within 180 days of license issuance and implement mitigation and enactment measures. Complete – Wildlife Habitat Protection and Management Plan filed as scheduled (see FERC Order, April 2, 1996) and amended in 1997. Conversion of City Light building in Newhalem to NPS Wildlife Research Center (1999); greenhouse construction (constructed in Marblemount by NPS with City Light funds); and wildlife lands acquisition. Ongoing – Payments to North Cascades Institute (NCI) for wildlife education; annual wildlife research grants; payments to NPS for annual wildlife monitoring in RLNRA; payments to USFS for bald eagle inventory and planning in the Wild and Scenic River corridor; wildlife habitat enhancement and restoration; and cultural resource evaluation as needed.
411	File a Project Aviation Marker Plan with FERC within 180 days of license issuance to install powerline` identifiers to protect bald eagles at the Project. Complete – Filed as scheduled (see FERC Order, July 13, 1998). Transmission line markers installed at Corkindale Creek crossing in 1999; monitoring finished in 2001.

Article	Article Summary and Compliance Status
412	File a Project Recreation Plan with FERC within 180 days of license issuance and implement continuing, mitigative, and enhancement measures. Complete – Filed as scheduled (see FERC Order, November 19, 1996). Amended in 1997, 2008, and 2018 (see FERC Orders, October 23, 1997, March 28, 2008; and October 17, 2018). *NCI* – Environmental Learning Center (ELC) design, construction, landscaping, furnishings, start-up; trail development, landscaping, and endowment (1996-2006). *NPS* – Americans with Disabilities Act (ADA)-accessible fishing facility (2003); Colonial Creek boat ramp (2004); Damnation Creek boat-in picnic facility (2000); Desolation-Hozomeen Trail (Alternatives); Goodell raft access (1999); Gorge Creek Overlook (1999); Gorge Lake boat ramp (2007); Happy Flats Panther Creek Trail (2005); Hozomeen boat ramp (2001); Hozomeen water distribution system (2001); renovation of Ross Lake shoreline campgrounds and docks (2007); Thunder Knob Trail (2001); ELC plant propagation (2006); interpretive signage at various overlooks and trailheads; future needs assessment funding as per license. *USFS* – Black Peak Overlook Alternatives (reprogrammed to upgrade trailhead facilities along State Route (SR) 20 in Okanogan and Wenatchee National Forest (2010); Lower Sauk Boat Access Site (2006); Marblemount Boat Access (2000); Skagit River Trail (aka Rockport State Park ADA Trail (2008); Sauk-Suiattle River Boat Access (2002); Copper Creek boat ramp (2009); various other capital improvement projects (i.e. Old Sauk River Trail) and interpretive signage design/installation projects; future needs assessment funding as per license. *City Light* – Bicycle facilities needs assessment (2003); Newhalem Visitor Contact Station (aka Skagit Information Center) construction (2002); Colonial Creek Campground electric supply cable replacement; ELC construction (2006). Ongoing – Funding for vehicles, wildlife programming, electricity and O&M at the ELC; various interpretive and capital projects for NPS and USFS as identified in the Settlement Agreement and subsequent modifications to the Recreation Resources Management Plan; O&M at NPS facilities within RLNRA and USFS facilities along the Skagit Wild and Scenic River and SR 20; Skagit Tours; annual contributions to the Skagit Environmental Endowment Commission (SEEC); Diablo Lake ferry service; Newhalem Playground and picnic facility maintenance.

Article	Article Summary and Compliance Status
413	File a Project Visual Quality Plan with FERC within 180 days of license issuance and implement provisions of the Settlement Agreement on Recreation and Aesthetics and the Report on Aesthetics filed on April 30, 1991. Complete – Filed as scheduled (see FERC Order, December 10, 1996); amended in 2021 (see FERC Order July 9, 2021). Landscape improvements and painting in Newhalem and Diablo; vegetation plantings for screening seven target sites in the transmission line right-of-way (ROW) identified in the Settlement Agreement; Gorge Dam access bridge painting (1997); Diablo surge tank painting (2001); Ross Dam broome gate painting (2005); removal of Diablo Person Lift (2000); shielding of exterior lights; removal of three storage buildings at the western edge of Newhalem revegetating the area, and adding a barrier-free pathway (late 1990s); replacement of roofs and siding with more visually compatible materials (1996-2007); removal of invasive species from, and replanting in, the Reflector Bar riparian area (2015-2017); vegetation screening of the Newhalem Maintenance Yard (2021); renovation of planting beds associated with Newhalem area RV and Ladder Creek parking lots and along SR 20 (2021). Ongoing – Maintenance of screening vegetation in the seven target sites within RLNRA; maintenance of vegetation in the transmission line ROW on City Light, state and federal lands according to the prescriptions in the Transmission ROW Vegetation Management Plan as modified to meet current NERC standards; consultation with NPS on appearance of new facilities and major maintenance projects; maintenance of planting beds in RV and Ladder Creek parking areas and along SR 20 (2021); invasive tree control in Newhalem. Ongoing – Transmission tower painting (to be done when scheduled maintenance requires painting of transmission towers); Ladder Creek Gardens replanting (scheduled for 2022-2023); restoration of native habitats in Reflector Bar residential area in Diablo (scheduled for 2022-2023) following removal of houses.
414	Implement provisions of the Memorandum of Agreement (MOA) By and Among FERC, Washington State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP), Sauk-Suiattle Tribe, Swinomish Tribal Community, and Upper Skagit Tribe, Nlaka'pamux Nation, and City of Seattle regarding the Skagit River Hydroelectric Project. Provide $1,817,000 to the three U.S. tribes and the Nlaka'pamux Nation as per the Settlement Agreements with these parties. The MOA requires that City Light fulfill the terms of the Settlement Agreement for Cultural Resources. Complete – All payments to the tribes and Nlaka'pamux Nation as per the Settlement Agreements. Accomplishments under the Settlement Agreement for Cultural Resources include: development of an Archaeology Resource Mitigation and Management Plan (ARMMP) for the Ross Lake National Archaeological District, a Historic Resources Mitigation and Management Plan (HRMMP), Newhalem Walking Tour brochure, Historic Structures Report for Gorge Inn and Cambridge House, an interpretive exhibit assessment, Skagit Maintenance Guidelines, and a computerized system for historic resources record keeping. Other completed measures: survey and testing in the Ross Lake drawdown area, Historic American Building Survey (HABS)/Historic American Engineering Record (HAER) documentation and publication, historic photograph conservation, an inventory of trees in the Newhalem Historic District and maintenance guidelines, an update to the National Historic Register (NHR 2010). Ongoing – Implementation of the provisions in the MOA between FERC, Washington SHPO, ACHP, tribes, and Nlaka'pamux Nation and the ARMMP on protection of cultural resources; ongoing maintenance and revitalization of interpretive exhibits; and updates to the Newhalem Walking Tour brochure as needed. Next update to the NHR is scheduled for 2020.

Article	Article Summary and Compliance Status
415	File an Annual Project Expenditures Plan for FERC approval on or before October 1 of each year that shows the amount of funding provided for expenditures under the license for the following year. File an annual Project Expenditures Statement with FERC by April 1 of each year reporting funds expended under the License for the previous year. Ongoing – On an annual basis.
416	File revised Exhibits F and K within 90 days of license issuance for FERC approval; include acreage of federal lands within the Project boundary and any off-site Project islands. FERC eLibrary indicates that City Light responded to requirements of License Article 416 on September 24, 1996.

As incorporated into the license by reference to the Settlement Agreement, City Light is required to submit periodic reports on implementation progress for the various resource programs (Table 3.5-2). These have been filed with FERC as scheduled and provided to the settlement agreement parties. In addition, as required by 18 CFR § 8.11, City Light submitted Form 80 reports for Project recreation facilities in 1997, 2003, 2009, and 2015. Effective March 2019, FERC Form 80 is no longer required.

Table 3.5-2. Resource program reporting requirements.

License Article	Report	Frequency and Due Date	
407	Flow Compliance Report	Semi-annually	4/30, 10/31
408	Non-Flow Program Report	Annually	7/15
409	Erosion Control Report	Every 2 years	5/15
410	Wildlife Report	Annually for 5 years, then every 5 years thereafter	4/31
411	Eagle/Transmission Line Action Plan	Complete, no further submittals	
414	Archaeological Report	Every 2 years for 10 years, then every 5 years thereafter	5/15
414	Historical Report	Every 2 years for 10 years, then every 5 years thereafter	5/15

FERC environmental compliance inspections occurred in 1997, 2005, 2012, and 2019. The 1997 and 2005 inspections did not identify any required corrective actions. The only item needing corrective action from the 2012 inspection was the absence of Part 8 signs for the Project. City Light subsequently installed signs at two sites – at the Skagit Information Center in Newhalem and at the tour dock on Diablo Lake. Following the 2019 inspection, FERC provided a letter (dated September 18, 2019) listing eight items needing corrective action at the Project. City Light completed all identified corrective actions and submitted the required documentation in 2019 and 2020 (Table 3.5-3).

Table 3.5-3. Action items from 2019 FERC environmental compliance inspection.

Action Items Identified in 2019 FERC Inspection	City Light Submittal to FERC
Provide description of any land acquisitions/exchanges that have occurred over the term of the license	Submitted description and maps 11/17/2019
Repair or replace the Newhalem gauge	Replaced gage on 8/23/2019; submitted documentation 10/17/19
Provide a plan and schedule to update signage on access road to upper end of inclined lift	Completed 10/16/2019; submitted documentation 10/17/2019
Provide a plan and schedule to update Part 8 signage and consider additional sign locations	Submitted plan and schedule to update existing Part 8 signs and add new Part 8 signs to Colonial Creek and Hozomeen boat launches, 04/29/2020
Provide a status report of the 17 measures included in the Visual Quality Plan and a plan and schedule to address any incomplete measures	Status review and schedule submitted 03/16/20; Visual Quality Plan revised and submitted 04/29/2020
Provide a detailed description of emergency response and feasibility assessment of secondary containment for hydraulic hoists at Ross Dam Intake Gate House	Completed description of emergency response and submitted 11/17/2019; submitted results of feasibility assessment for secondary containment and initial upgrades implemented at Ross Dam Intake Gate House, 09/15/2020.
Provide a detailed description of emergency response and feasibility assessment of secondary containment for the hydraulic hoists at Gorge Dam Power Intake Building	Completed description of emergency response and submitted 11/17/19; submitted results of feasibility assessment for secondary containment and initial upgrades implemented at Gorge Dam Power Intake Building, 09/15/2020
Provide a plan and schedule to empty and remove the two Hozomeen fuel storage tanks	Removed tanks on 10/31/2019; submitted documentation 11/17/2019

3.6 Actions Taken by Existing Licensee Related to the Project which Affect the Public

Throughout the term of the current license, City Light has been an integral part of the community in which it operates and has consistently gone beyond the requirements of the license. The relicensing process itself is perhaps the most widely visible and contemporary example of City Light's long history of commitment to open communications and environmental stewardship. Other specific examples of City Light's actions related to the Project that have involved public outreach and environmental stewardship are briefly described below.

Economic Support

The Skagit River Project employs 92 people, most of whom live and shop in the Skagit Valley in the communities of Marblemount, Rockport, Concrete, Sedro Woolley, Burlington, and Mt. Vernon. Additional economic support from the Project includes:

Compensatory Payments – City Light provides an annual payment to Whatcom County based on the rate of taxation imposed under state law on the output of generation facilities of Public Utility Districts. The payment in 2022 was $1,206,391; between 2009 and 2023 payments will total $15,849,406.

Fire Protection and Control – City Light has its own fire chief, volunteer fire brigade and two fire

stations, one in Diablo and one in Newhalem. In addition to providing fire protection for Project generation facilities and for the townsites, the City Light fire brigade coordinates with the NPS to respond to fires in nearby areas.

Emergency Response – City Light's fire brigade provides emergency response to accidents and other incidents along SR 20 in coordination with the Whatcom County Sheriff's Office, Washington State Patrol and NPS.

In-kind Participation in Local Events – City Light supports a number of local events (e.g., the Bald Eagle Festival) with staff time.

Training – City Light provides joint training sponsorship for local First Responders and Volunteer rescue operations (part of fire district support – in-kind contributions through use of employees).

Law Enforcement – City Light pays the Whatcom County Sheriff's Office for law enforcement services on lands and roads outside the RLNRA.

Recreational Opportunities

Because of its location in the RLNRA, most of the recreation facilities within the Project Boundary are managed by NPS, not City Light. These include multiple campgrounds and trailheads along Diablo and Ross lakes. The current Project license provides capital funding for NPS to construct and upgrade a variety of recreational facilities in the RLNRA. Funding is also provided to USFS to develop and improve multiple recreational sites within the Skagit River Wild and Scenic River System and along SR 20. City Light does, however, provide several recreational opportunities to the public in the Project vicinity:

Recreation Facilities – City Light's recreational opportunities at the Project are focused on interpretation and education. Under the current license, City Light built the North Cascades ELC on Diablo Lake. This facility is operated for City Light by NCI and offers environmental education programs to children, teenagers and adults. It has served more than 50,000 people between 2004 and 2019.

Other recreational facilities provided by City Light at the Project include the Gorge Inn Museum, the Gorge Powerhouse Visitor Gallery, the Skagit Information Center, Ladder Creek Falls Trail and Trail of the Cedars. The Skagit Information Center, which is located just off SR 20 on Main Street in Newhalem, includes restrooms, a breezeway with cases for maps and other information, and a large room with interpretive exhibits. In addition, there are numerous interpretive signs in Newhalem and along the Ladder Creek Trail and Trail of the Cedars that convey information on Project history and operations. City Light also provides picnic tables in both Newhalem and Diablo, a picnic shelter in Diablo, and an ADA-compliant playground in Newhalem.

Reservoir Summer Pool Levels – During the summer recreation season (Memorial Day through Labor Day) City Light makes best efforts to maintain Diablo and Gorge reservoirs at close to full pool to facilitate boat access and related recreational activities. The Project license requires Ross Reservoir to be at full pool (1,608.76 feet NAVD 88 [1,602.5 feet CoSD]) from July 31 through Labor Day. City Light fills Ross Lake as soon as possible after April 15 and attempts to be close to full pool by July 1, Canada Day to provide access to the boat ramp at Hozomeen.

Tours – City Light has offered guided group tours of the Project annually since 1928, with relatively few interruptions. While tour focus and format has changed over the years, the core of

the Skagit Tour Program involves a boat trip on Diablo Lake with narration on the history and operation of the Project and the North Cascades ecosystem provided by guides. The tour boat has a capacity of 49 and is ADA accessible. In recent years, the Diablo Lake boat tours have been run twice daily, five days per week, from the first week of July through the end of September. In addition to the boat tours, City Light offers guided tours of Newhalem and Gorge Powerhouse and a night-time guided walk to Ladder Creek Falls combined with dinner at Gorge Inn. The tours are conducted through a partnership with NPS and NCI and in a normal year serve over 4,500 people.

Ferry Service – City Light provides ferry service for the public to access Ross Lake. The ferry runs twice daily from mid-June through mid-October, dates that align with operation of Ross Lake Resort. The ferry runs from a dock on the west end of Diablo Lake to the east end, where a shuttle from the Resort is available for transport to Ross Lake. In addition to Ross Lake Resort patrons, the ferry is also used by hikers.

Fish Stocking – Under the current license, City Light funds a resident rainbow trout production program at the Marblemount Fish Hatchery, which is run by the Washington Department of Fish and Wildlife (WDFW), to enhance the recreational fishery in Gorge and Diablo lakes. In 2020 there were 108,280 juvenile rainbow trout released into Gorge Lake and 249,097 into Diablo Lake; about 4,000 were retained as broodstock.

Hunting and Fishing – City Light owns and manages over 10,000 acres of fish and wildlife habitat lands. These lands are open for hunting and fishing subject to all applicable laws and regulations. They also provide opportunities for hiking, cross-country skiing, picnicking, and collection of berries and mushrooms for non-commercial use.

Regional Tourism Promotion

Skagit Tour Promotion – City Light promotes the tours through advertising in local publications such as the Concrete Herald, the Skagit Valley Herald and the Cascade Loop Travel Guide. In some years the tours are advertised in regional publications, such as Sunset Magazine and Alaska Airlines Magazine. Advertising inserts are also added to customer bills to promote the tours. City Light also develops brochures and other promotional materials about Skagit Tours that are displayed by local businesses and in public spaces

Video Production – City Light worked with NCI to create virtual video tours during the pandemic to promote the region and the North Cascades National Park. In 2018, City Light created the film "Escape from Diablo" and hosted community events to share the film and its message about how to evacuate the Project vicinity in the event of an emergency such as a wildfire. There have been multiple video productions over the years on the Skagit Tour program and other local recreational opportunities.

Tourism Development – City Light partners with the Cascade Loop Foundation to promote tourism along the Cascade Scenic Highway. Participation includes media tours for photographers and journalists representing Everett Herald, the Seattle Channel and other tourism businesses from Bellingham and local communities. City Light provides funding to the USFS to support the Eagle Watchers Program that promotes bald eagle viewing and stewardship along the Skagit River.

Social Media – City Light shares news of local events such as festivals with postings to Twitter, Facebook and Instagram accounts. The City Light website describes current events and activities available in the Project vicinity.

Skagit General Store – City Light runs a general store in Newhalem that is open to the public and supports regional tourism by providing goods to people camping nearby or travelling through the area on SR 20. With a bulletin board out front and knowledgeable staff, the store also serves as an informal information provider for travelers when the Skagit Information Center and Newhalem Visitor Center are closed.

Environmental Stewardship

The current Skagit River Project license includes many measures that promote environmental stewardship. These measures and their effectiveness are described in detail in the Effectiveness Assessment of the Existing License Measures (City Light 2022f, appended to Exhibit E of this FLA) and summarized below.

Fish Protection Flows – Flows from the Project are managed year-round with the goal of protecting 100 percent of the salmon and steelhead spawning and rearing in the Skagit River downstream.

Fish and Wildlife Habitat Protection – City Lights owns and manages 10,804 acres of fish and wildlife habitat land in the Skagit and Nooksack river drainages. These lands include wetlands and riparian and upland forests and provide habitat for native salmonids, waterfowl, migratory birds, carnivores, and big game. Additional lands have been purchased in the Skagit River drainage with funds from City Light's Endangered Species Early Action Program. This is a separate utility-wide program focused on protecting and improving habitat for federally listed fish species in the river basins where City Light operates hydroelectric projects.

Fish and Wildlife Habitat Restoration and Development – City Light has decommissioned roads, removed bridges, riprap, culverts and other abandoned infrastructure, and replanted disturbed areas on its fish and wildlife lands. In addition, City Light developed 17 acres of elk forest habitat on a parcel in the South Fork Nooksack drainage and has created and maintains five new off-channel fish habitat sites, totaling nearly 5 acres.

Fish and Wildlife Research Support – Over the last 25 years, City Light has supported 18 major research studies on Chinook and Chum salmon, steelhead, and Bull Trout in the Skagit River. These studies have been led and conducted by the Indian Tribes and federal and state agencies in collaboration with the University of Washington and other research institutes. Additional funding for some studies has been provided by City Light's Early Action Program.

In addition, the license includes annual grant funding for research focused on wildlife, plants, and ecosystem processes in the North Cascades and the Skagit River basin. To date, over 60 studies have been funded by these grants and conducted by universities, resource agencies, independent researchers, Indian Tribes, and non-profits.

City Light also developed a research support facility by remodeling a historic building in Newhalem. The facility is for the sole use of the NPS while conducting research in the RLNRA.

Ecological Monitoring Support – Funds from the license have been provided annually to the NPS for ongoing long-term ecological monitoring in the RLNRA to guide resource management activities and identify long-term trends. Recent monitoring efforts have focused on reed canarygrass infestations along Ross Lake; peregrine falcon and bald eagle nest sites; gray wolves; fishers; and marmot and pika distribution and abundance. In addition, funding was provided to the USFS to conduct boat-based bald eagle foraging/roosting surveys every five years up to 2010, synthesize the data from both survey types, and prepare a report on bald eagle use along the Skagit

and Sauk rivers.

Wildlife Education – City Light provides annual funding to NCI to support wildlife education programming at the ELC.

Erosion Control – City Light provides annual funding to the NPS to monitor and implement erosion control measures at sites along the Project reservoirs. Since 1995, erosion control structures have been installed and maintained at 25 recreation sites along the reservoirs. Additional funding is provided to maintain a greenhouse and to collect seeds and propagate plants for erosion control purposes. City Light also addresses erosion along Project-related roads by installing water bars, culverts, bridges, berms, dikes and ditches, and by planting vegetation along exposed steep slopes.

Noxious Weed Control – The Project license did not include any measures for noxious weed control. However, City Light and NPS biologists identified multiple invasive plant species in parts of the Project vicinity in periodic surveys conducted over the years. Since about 2013, City Light has contracted annually with several entities to reduce the prevalence of high-priority noxious weed species from the riparian area adjacent to Newhalem, portions of the transmission line ROW, and Ladder Creek Gardens. This work is focused on treating infestations of sycamore maple and other invasive tree species, as well as English ivy, Scotch broom and clematis. Where appropriate, treated sites are replanted with native species.

3.7 Summary of the Ownership and Operating Expenses that Would be Reduced if the Project Licensee Were Transferred from the Existing Licensee

If the Project license were transferred from City Light, then City Light will no longer be responsible for operating and maintaining the Project or paying the associated taxes, land use, and administrative fees. Costs related to operations, maintenance, and FERC fees related to the Project will be reduced by approximately $41.6 million annually as described in Exhibit D, Section 6, of this FLA.

In the future, these expenses will likely increase either with general price inflation or due to factors specific to the category. Furthermore, future expenses at the Project include terms and conditions to be incorporated into the new license. If the Project license were transferred from City Light, then City Light will avoid these future expenses.

3.8 Annual FERC Fees Paid Under Part 1 of the Federal Power Act

Since the initial construction of the Project, City Light has paid annual FERC administrative charges and significant fees under Section 10(e) of the FPA. FERC fees include Water for Power (FERC Account 536), and use of federal lands managed by USFS and NPS (FERC Account 540). Table 3.8-1 shows the total FERC fees paid by City Light for the period 2017-2021. In 2021, charges for the Project totaled $4,878,999.

Table 3.8-1. FERC fees for the Skagit River Project, 2017-2021.

Year	Total
2017	$4,237,959
2018	$4,646,422
2019	$4,208,389
2020	$3,735,987
2021	$4,878,999

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