Evaluation of the Historic Built Environment for the Newhalem Creek Hydroelectric Project Decommissioning, Newhalem, Whatcom County, Washington

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January 2024

Lentz, Corey, and January Tavel. 2024. *Evaluation of the Historic Built Environment for the Newhalem Creek Hydroelectric Project Decommissioning, Newhalem, Whatcom County, Washington*. January. (ICF 103729.0.003.01). Prepared by ICF, Seattle, WA. Prepared for Seattle City Light, Seattle, WA.

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Acronyms and Abbreviations

AC	alternating current
APPA	American Public Power Association
APE	area of potential effects
BPA	Bonneville Power Administration
CFR	Code of Federal Regulations
City Light	Seattle City Light
CCFC	Coast Culvert & Flume Company
DAHP	Washington State Department of Archaeology and Historic Preservation
DC	direct current
DPDC	Diablo Powerhouse and Dam Complex
EA	Environmental Assessment
EAP	Skagit Emergency Action Plan
EEICSF	Edison Electric Illuminating Company of Spokane Falls
FERC	Federal Energy Regulatory Commission
FPC	Federal Power Commission
GIS	geographic information system
GPDC	Gorge Powerhouse and Dam Complex
HPIF	Historic Property Inventory Form
kVA	kilovolt ampere
NCHP	Newhalem Creek Hydroelectric Project
NCPDC	Newhalem Creek Powerhouse and Dam Complex
NCSHA	North Cross-State Highway Association
NCVC	North Cascades Visitor Center
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLPC	Northwest Light & Power Company
NPA	Northwest Power Act
NPP	Northwest Power Pool
NPS	National Park Service
NRHP	National Register of Historic Places
PNPSI	Pacific Northwest-Pacific Southwest Intertie
PPLC	Pacific Power & Light Company
PSPLC	Puget Sound Power & Light Company
PUD	public utility district
PUHCA	Public Utility Holding Company Act of 1935
PWWC	Pelton Water Wheel Company
RCW	Revised Code of Washington
REA	Rural Electrification Administration
RLNRA	Ross Lake National Recreation Area

RPDC	Ross Powerhouse and Dam Complex
SCPLC	Stevens County Power and Light Company
SEC	Seattle Electric Company
SEPA	State Environmental Policy Act
SRHP	Skagit River Hydroelectric Project
SRNCHP	Skagit River and Newhalem Creek Hydroelectric Projects
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USFS	U.S. Forest Service
USGS	United States Geological Survey
USIT	Upper Skagit Indian Tribe
WHR	Washington Heritage Register
WISAARD	Washington Information System for Architectural and Archaeological Records Data
WPUDA	Washington Public Utility District Association
WSG	Washington State Grange
WWPC	Washington Water Power Company

Chapter 1
Introduction

Seattle City Light (City Light) proposes to surrender the agency's Federal Energy Regulatory Commission (FERC) license (FERC No. 2705) for the Newhalem Creek Hydroelectric Project[1] (NCHP) and decommission the NCHP. The NCHP license surrender and decommissioning (the Project) is a federal undertaking. As a result, the project must comply with Section 106 of the National Historic Preservation Act (NHPA), in which FERC has designated City Light as the nonfederal lead agency.

As part of this process, City Light has undertaken the following actions: provided a draft application for license surrender to the National Park Service (NPS) in November 2021, addressed NPS comments to the draft application in December 2021, and filed an Application for Surrender of License with FERC in January 2022. FERC provided a notice of City Light's application for public review for a period of 30 days in April 2022 (FERC 2021). Upcoming actions to be taken by City Light and FERC as part of the license surrender and decommissioning process include FERC's issuance of a draft National Environmental Policy Act (NEPA) Environmental Assessment (EA) anticipated in June 2023, FERC's issuance of a final NEPA EA in winter 2023, and FERC's issuance of an order to decommission the facilities in 2024 or 2025. Decommissioning of the NCHP is anticipated in 2025.

To support compliance with Section 106 of the NHPA, City Light retained ICF to assist with review of historic built environment resources within the area of potential effects (APE). This technical report describes the methods, results, and technical recommendations for identification, evaluation, and assessment of effects on built environment historic properties, including the Skagit River and Newhalem Creek Hydroelectric Projects historic district (SRNCHP (DT 66)), consisting of the discontiguous Skagit River Hydroelectric Project[2] (SRHP) and the NCHP, as well as other contributing and individually eligible built environment historic properties. Identification and evaluation of other historic properties, including archaeological sites and traditional cultural properties will be conducted under separate studies at a later date.

A historic built environment survey identified nine historic built environment resources in the project boundary. Of these nine resources, none were recommended individually eligible for listing in the National Register of Historic Places (NRHP). Six properties were recommended eligible for listing in the NRHP as contributors to the SRNCHP (DT 66) historic district: the powerhouse, headworks, power tunnel, penstock, Newhalem Creek Bridge, and trail network. The remaining

[1] For the purposes of this technical report, the term *Newhalem Creek Hydroelectric Project* refers to the Newhalem Creek Hydroelectric Project licensed by FERC as FERC No. 2705 and the term *Newhalem Creek Powerhouse and Dam Complex* refers to the buildings, structures, and sites that comprise this hydroelectric project.

[2] For the purposes of this technical report, the term *Skagit River Hydroelectric Project* refers to the Gorge, Diablo, and Ross hydroelectric projects that are collectively licensed by FERC as FERC No. 553 and the terms *Gorge Powerhouse and Dam Complex*, *Diablo Powerhouse and Dam Complex*, and *Ross Powerhouse and Dam Complex* refer to buildings, structures, and sites that respectively comprise those three hydroelectric projects. Additionally, individual properties associated with these complexes identified in the 2010 NRHP nomination for the SRHP are identified by those names in this report (i.e., the Gorge Powerhouse). Components of the GPDC, DPDC, and RPDC that are not individually identified properties are referred to with the name of the complex and component in this report (i.e., the GPDC power tunnel).

three properties (the tailrace, transmission line, and access roads) were recommended not eligible for listing in the NRHP as contributors to the SRNCHP (DT 66).

This technical report assesses the effects of two Decommissioning Action Alternatives—Full Removal/Abandonment of Project Features (Full Removal Alternative) and Partial Removal/Abandonment of Project Features (Preferred Alternative)—to the NRHP-eligible historic built environment resources identified in the APE. The specific activities of the two alternatives are described in the following section, *Project Description.* The Preferred Alternative would have an adverse effect on two properties evaluated as eligible contributors to the SRNCHP (DT 66): the headworks and power tunnel. However, the Preferred Alternative would not have an adverse effect on any of the four other properties evaluated as eligible contributors to the SRNCHP (DT 66): the powerhouse, penstock, Newhalem Creek Bridge, and trail network. The Full Removal Alternative would have an adverse effect on five of the six properties evaluated as eligible contributors to the SRNCHP (DT 66)—the powerhouse, headworks, power tunnel, penstock, and trail network—but would not have an adverse effect on the Newhalem Creek Bridge.

1.1 Project Description

The two Decommissioning Action Alternatives analyzed in this report include the Preferred Alternative and the Full Removal Alternative. The following project descriptions are excerpted from City Light's 2022 *Newhalem Creek Hydroelectric Project (FERC No. 2705) Application for Surrender of License* (City Light 2022c:E-2–E-4).

1.1.1 Full Removal Alternative

The Full Removal Alternative would include the following.

> [The Full Removal Alternative] would completely remove all aboveground buildings, structures, and equipment associated with the Project, including the powerhouse, powerhouse equipment, tailrace fish barrier, penstock, penstock saddles, dam, sluiceway/intake, gatehouse, and pedestrian bridge. The only remaining aboveground features would be the tailrace, since it is part of an intermittent stream, and the Skagit Emergency Action Plan (EAP) emergency evacuation routes, which include the diversion dam access road to elevation 840 feet and the trail leading to the lower end of the rock tunnel [the Tunnel Portal Trail]. The power tunnel and buried power lines through Newhalem, both of which are underground features, would be abandoned in place.
>
> The diversion dam and headworks would be removed by first installing supersacks to divert the flow of water and enable working in the dry, then demolishing the concrete with an excavator-mounted jackhammer. Concrete would be disposed of at an off-site location, although it may be possible to use the rock shaft for disposal of a small amount of material. Work would require some road repair and stabilization to allow access by equipment and trucks. Helicopters could also be used for all or some of the work, which would reduce the number of truck trips and possibly decrease the amount of necessary road work. The gatehouse and pedestrian bridge would be removed after work on the diversion dam and sluiceway/intake is complete. The road would be decommissioned above the Skagit EAP evacuation muster site once the dam and other headworks structures are removed.
>
> The power tunnel would be abandoned and sealed at the upper end. The penstock would be cut from the concrete plug separating the power tunnel from the penstock and removed from the rock tunnel. The opening of the rock tunnel would be gated to allow for the drainage of ground water that enters the tunnel through cracks in the rock. Depending on the drainage volume of water, a pipe may be needed to convey water to a different location once the penstock is removed, or the tunnel could be sealed to allow water to infiltrate into the cracks present in the tunnel.

The penstock and saddles would be removed with a conventional excavator or an articulated excavator, the former of which would require constructing a new route partially up the slope to the lower thrust block above the powerhouse. The excavator would remove material along the alignment as allowed by the slope. Upper portions of the penstock would be taken down using cables to control movement or potentially with helicopter assist. The penstock would be separated at the expansion joints and pulled or lowered down the hill using an excavator. The 54 concrete saddles (plus 2 wooden saddles) situated every 20 ft up the hillside would also be removed. The saddles are 6 ft wide, 10 inches (in) thick, range from 4.3 to 6 ft tall, and are either buried approximately 3 ft deep or embedded onto bedrock with four rock anchors. The six concrete thrust blocks range in size from 5 ft long by 5 ft wide to 10 ft long by 7 ft wide, with heights between 5 and 8-ft and varying depths. The saddles and the thrust blocks would be broken apart with an excavator or hand tools and cut and chipped from the bedrock with a jackhammer and moved off the slope. Trucks would be used to remove material to an off-site disposal area.

The transmission and electrical service lines across the river would be removed, along with the power poles. The underground lines between the river and the powerhouse would be excavated and removed. The powerhouse and its foundation would be demolished with an excavator and/or other conventional equipment. Equipment inside the powerhouse and the transformer would be salvaged or disposed of offsite. The powerhouse site and the cleared area adjacent to the powerhouse, which includes a section of road, the transmission line right-of-way, parking, and storage, would be restored.

The tailrace would be retained because it is part of an intermittent stream. The tailrace fish barrier would be demolished with an excavator-mounted jackhammer, assisted by a non-explosive cracking agent, concrete saw, and/or waterjet cutter. Additionally, the riprap associated with the tailrace barrier and the spur trail and viewing area would be removed. The former road used to install the tailrace barrier is still evident and would be re-commissioned for this work. (City Light 2022c:E-2–E-4)

1.1.2 Preferred Alternative

The Preferred Alternative would include the following.

[The Preferred Alternative] is similar to [The Full Removal Alternative], but the powerhouse and penstock would remain and be interpreted as historic resources. The equipment in the powerhouse would be deactivated but retained in place. The electrical service line to the powerhouse and associated poles would also remain for heating and to illuminate the equipment inside for interpretive purposes. The existing interpretive panels along the front windows of the powerhouse would be updated, and other interpretive elements would be added. City Light would continue to maintain these historic properties and interpretive features in perpetuity. Additional opportunities for interpretation, including signage displaying tribal, NPS, and City Light history along the trails in the vicinity, may also be considered.

Most of the cleared area adjacent to the powerhouse would be revegetated except for a small site for parking up to three vehicles at the road's edge, south of the powerhouse. Routine vegetation maintenance outside the immediate footprint of the penstock would cease, which would result in the restoration of the adjacent corridor to forested habitat. Vegetation would be removed only as necessary to repair or repaint the penstock. Painting would occur approximately every 10 to 20 years. The penstock would continue to convey groundwater intrusion from the power tunnel to the tailrace. The access road above elevation 840 ft and the trail along the penstock would continue to be maintained by City Light as emergency evacuation routes, as part of the Skagit EAP (City Light 2022c:E-4).

1.2 Project Location

The NCHP is in the vicinity of Newhalem, Whatcom County, Washington, in the Ross Lake National Recreation Area (RLNRA), a subunit of the NPS North Cascades National Park Complex. The NCHP is in Sections 20, 21, 28, and 29; Township 37 North; Range 12 East; in the Diablo Dam, Washington, and Mount Triumph, Washington, Quadrangles. See the project boundary shown in **Figure 1**.

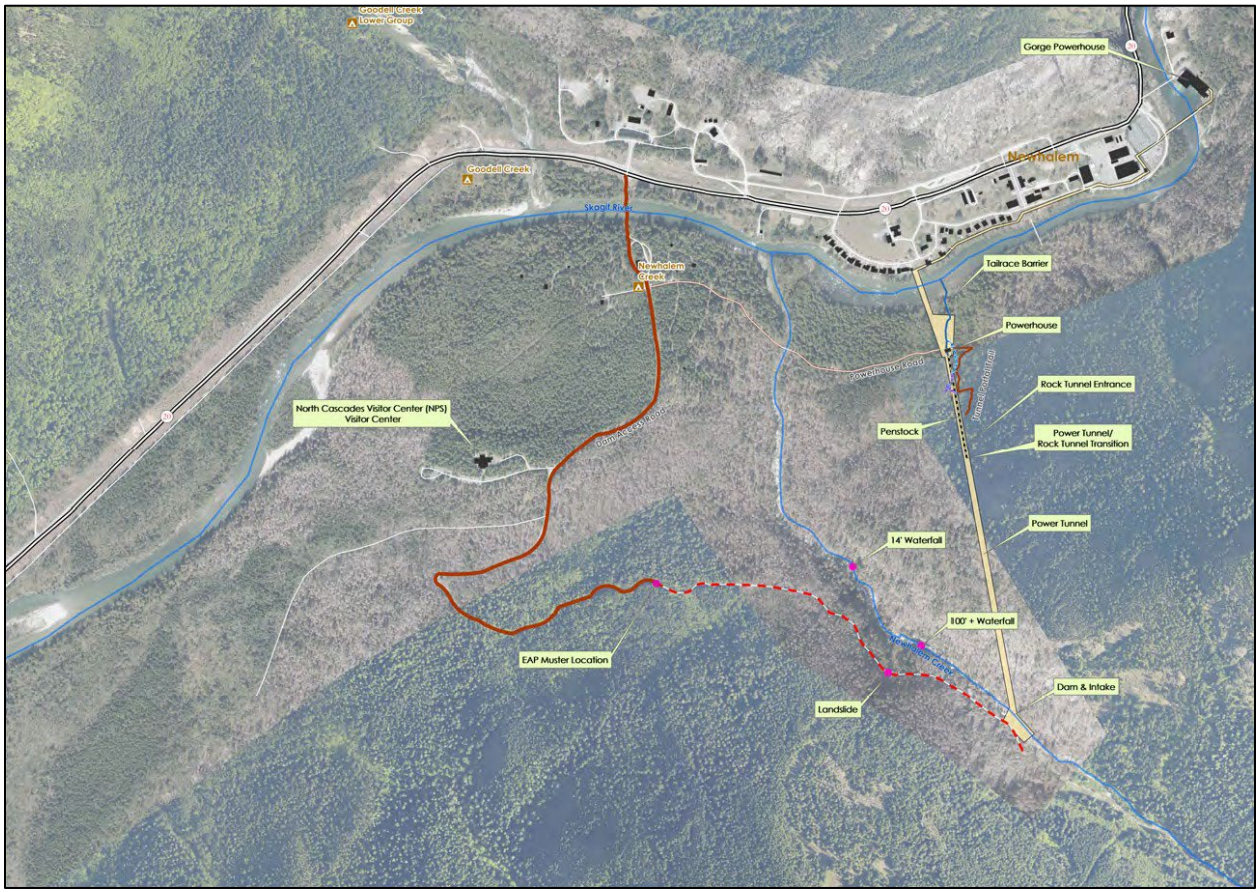
1.3 Area of Potential Effects

The area of potential effects (APE) is defined as the geographic area or areas within which the Project may directly or indirectly cause a change to the character or use of historic properties (36 Code of Federal Regulations [CFR] 800.16.d). The APE is 2,010.6 acres, including the smaller project boundary and a buffer area to ensure assessment of potential visual, auditory, or atmospheric effects that may occur from the project beyond the limits of construction. The project boundary consists of locations where project construction activities would occur, including demolition, abandonment, or retention of NCHP components. The APE has been delineated considering the horizontal and vertical extent of project activities. However, for the purposes of the current study, only potential effects on historic built environment resources are assessed. Archaeological resources are not analyzed in this document, and will be identified and evaluated in a future document. The extent of the APE is shown in **Figure 2**.

1.4 Section 106 Consultation

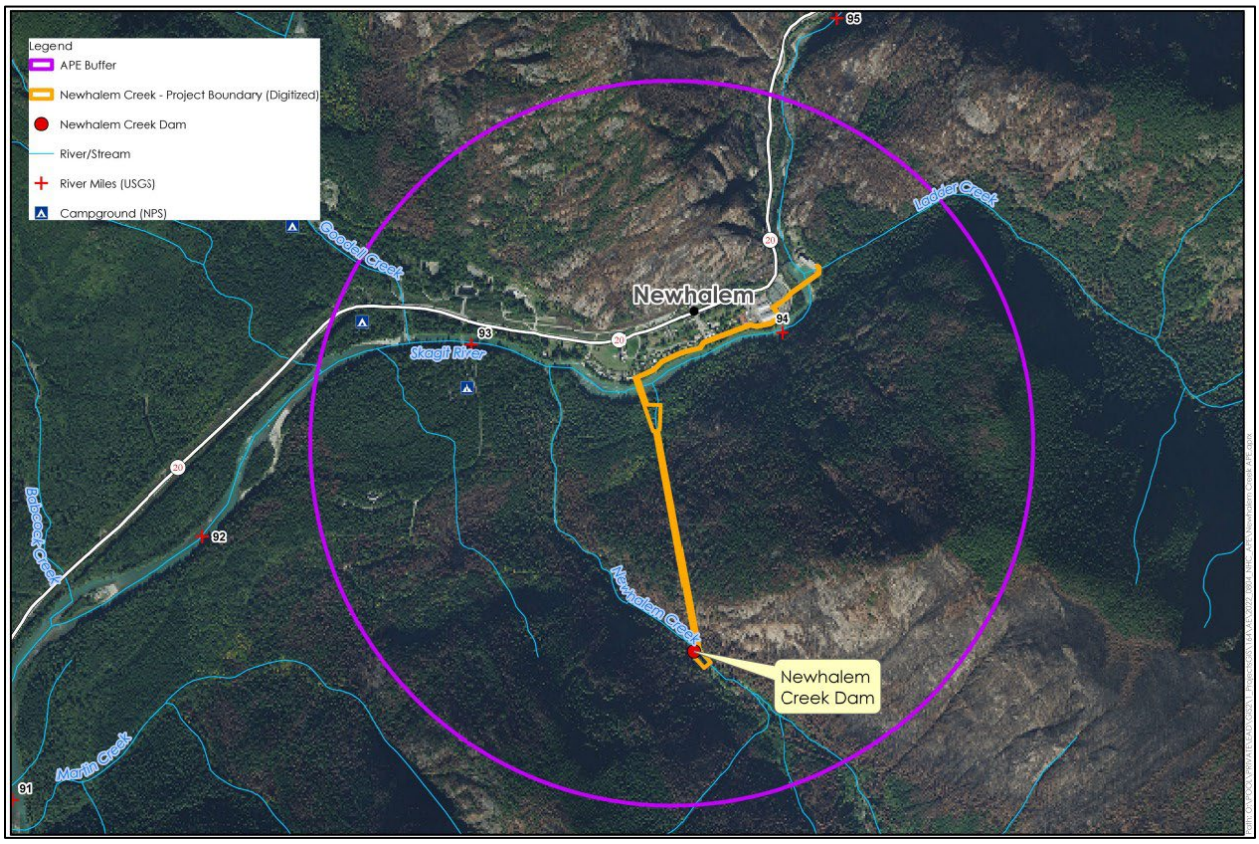
As FERC's designated nonfederal lead agency, City Light initiated Section 106 consultation with the Washington Department of Archaeology and Historic Preservation (DAHP) on August 11, 2022. City Light also conducted consultation with the NPS, which manages the RLNRA where the Project is located, and Tribes whose ancestors traditionally inhabited the project vicinity, including the Sauk-Suiattle Indian Tribe, Swinomish Indian Tribal Community, and Upper Skagit Indian Tribe (USIT). NPS and USIT accepted this invitation with specific interest to consult on the Project's historic built environment assessment.

Figure 1. Newhalem Creek Hydroelectric Project location map



Source: City Light 2022c:A-2

Figure 2. Area of Potential Effects



Source: City Light 2022a:8.

1.5 Personnel

Secretary of the Interior-qualified professional architectural historian, January Tavel, MHP provided senior review of this technical report. This report was co-authored by key personnel: January Tavel, and Secretary of the Interior-qualified professional architectural historian, Corey Lentz, MS. Geographic information system (GIS) analysis and figure preparation was conducted by William Linder, MA. Corey Lentz and William Linder performed the field survey of built environment resources.

1.6 Regulatory Context

Federal, state, and local regulations recognize the public's interest in historic built environment resources and the public benefit of preserving them. These laws and regulations require project proponents to consider how a project might affect the historic built environment and to take steps to avoid or reduce potential damage to them.

1.6.1 Federal

This document has been prepared to satisfy federal, state, and city cultural resources regulatory requirements. The key applicable federal and state laws and regulations are described below.

1.6.2 National Historic Preservation Act

The project requires City Light to complete a FERC license surrender application prior to the decommissioning of the NCHP. As FERC is a federal agency, this application and the subsequent decommissioning of the facility is therefore considered a federal undertaking. As a federal undertaking, the project must comply with Section 106 of the NHPA. The NHPA is the primary mandate governing projects under federal jurisdiction that might affect cultural resources. Specifically, Section 106 requires federal agencies to consider the effects of approved undertakings having the potential to affect any district, site, building, structure, or object that is listed in, or eligible for listing in, the NRHP. An undertaking is defined as a "project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval" (36 CFR 800.16.y). Under Section 106, the lead federal agency must provide an opportunity for the State Historic Preservation Officer, affected Tribes, and other stakeholders to comment. The Section 106 process is codified in 36 CFR 800.

1.6.2.1 National Register of Historic Places

The NRHP was established by the NHPA in 1966 as "an authoritative guide to be used by federal, state, and local governments; private groups; and citizens to identify the nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment." The NRHP recognizes properties that are significant at the national, state, and local levels. According to NRHP guidelines, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that meet at least one of four NRHP criteria.

Districts, sites, buildings, structures, and objects are defined as follows per NPS (1995:4-5).

- **District.** A significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.
- **Site.** The location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archeological value regardless of the value of any existing structure.
- **Building.** A building is created principally to shelter any form of human activity and may also be used to refer to a historically and functionally related unit.
- **Structure.** Distinguishes from buildings those functional constructions made usually for purposes other than creating human shelter.
- **Object.** Distinguishes from buildings and structures those constructions that are primarily artistic in nature or are relatively small in scale and simply constructed. Although it may be, by nature or design, movable, an object is associated with a specific setting or environment.

The seven aspects of integrity are defined as follows per NPS (1995:44-45).

- **Location.** The place where the historic property was constructed or the place where the historic event occurred.
- **Setting.** The physical environment of a historic property.
- **Design.** The combination of elements that create the form, plan, space, structure, and style of a property.
- **Materials.** The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- **Workmanship.** The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
- **Feeling.** A property's expression of the aesthetic or historic sense of a particular period of time.
- **Association.** The direct link between an important historic event or person and a historic property.

The four NRHP criteria are defined as follows per NPS (1995:11).

- **Criterion A**. Associated with events that have made a significant contribution to the broad patterns of our history.
- **Criterion B**. Associated with the lives of persons significant in our past.
- **Criterion C**. Embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.
- **Criterion D**. Yields, or may be likely to yield, information important in prehistory or history.

The NRHP requires that a resource not only meet one of these criteria but must also possess integrity. Integrity is the ability of a property to convey historical significance. The evaluation of a resource's integrity must be grounded in an understanding of that resource's physical

characteristics and how those characteristics convey its significance. Those resources that are listed in or eligible for listing in the NRHP are called *historic properties*, regardless of age.

1.6.3 State

1.6.3.1 State Environmental Policy Act

Washington's State Environmental Policy Act (SEPA) requires that all major actions sponsored, funded, permitted, or approved by state and/or local agencies be planned so that environmental considerations—such as impacts on historic and cultural resources—are considered when state agency-enabled projects affect properties of historic, archaeological, scientific, or cultural importance (Revised Code of Washington [RCW] 43.21). Similar to NEPA, SEPA considers cultural resources to be properties listed in or eligible for listing in national, state, or local historic registers.

1.6.4 Local

Whatcom County, Washington, does not have a historic preservation ordinance. However, the county's current comprehensive plan addressed cultural resources in Chapter 2, Land Use, Goal 2RR, which provides for the conservation or enhancement of important cultural resources through Policy 2RR-7, and Goal 2AAA. Policy 2RR-7 and Goal 2AAA encourage the recognition and preservation of the county's historical and archaeological attributes and the identification of lands, sites, and structures that have historical archaeological significance through Policies 2AAA-1–2-AAA-11 (WCPDSD 2016:2-92, 2-110–2-111). However, because the Project is on federal land in Whatcom County, the comprehensive plan goals related to cultural resources would not apply to the APE.

The City of Seattle, King County, Washington has a historic preservation ordinance. Although the Project involves properties owned and operated by City Light, a City of Seattle department, the Project APE is outside the jurisdictional boundaries of the City's historic preservation ordinance (City of Seattle Municipal Code, Chapters 25.12) and does not apply to the APE.

Chapter 2
Methods

This chapter summarizes the methods ICF used to conduct research for preparation of the historic context, conduct records review, complete the field survey, evaluate NRHP eligibility, and assess effects on historic properties.

2.1 Research

Research conducted to prepare Chapter 3, *Historic Context*, and to support property identification and NRHP eligibility evaluation included the following records collections, repositories, and websites.

- University of Washington Special Collections
- Washington Information System for Architectural and Archaeological Records Data (WISAARD)
- Washington State Archives, Puget Sound Branch
- Nationwide Environmental Title Research Online
- Seattle Municipal Archives
- NRHP Database
- Archival materials provided by City Light, including historic construction drawings and specifications, and photographs of NCHP components, as well as historic newspaper articles and Federal Register entries related to the NCHP.

2.2 Records Search

ICF architectural historians conducted a record search on September 23, 2022, using WISAARD to identify previously documented historic built resources within a 0.25-mile radius of the APE. WISAARD includes completed cultural resources survey reports, properties listed in (or determined eligible for listing in) the NRHP, Washington Heritage Register (WHR)-listed properties, archaeological sites, cemeteries, and inventoried historic built resources. For the purposes of this study, the WISAARD records review was limited to historic built environment resources.

The records review also included NPS NRHP records available via the NPS Gallery Digital Asset database. A records search was conducted to identify known NRHP-listed historic districts in the APE and within a 0.25-mile radius of the APE. The NPS Gallery Digital Asset database includes all digitized NRHP records on file with the National Archives and Records Administration. The results of the records review are summarized in Chapter 4, *Records Review Findings*.

2.3 Historic Built Environment Resources Survey

ICF performed an intensive historic built environment resources survey of the APE, with a focus on the project boundary on September 26, 2022. Two cultural resources staff were present for the survey, which included photographic documentation and preparation of field notes. The historic built environment resources survey identified and documented nine properties within the project boundary portion of the APE that are 45 years of age or older (built prior to 1978) to determine eligibility for listing in the NRHP. All nine properties surveyed were previously unevaluated for individual NRHP eligibility; however, some had been previously evaluated and determined to contribute to the district (**Table 1**).

This survey sought to identify historic built environment resources associated with the NCHP. **Table 1** summarizes details for the nine properties in the APE identified for the historic built resources survey and documentation. **Figure 3** provides the location of these resources based on Map ID assignments in **Table 1**. Survey results, including evaluations of these resources for both individual eligibility for listing in the NRHP and as contributors to the SRNCHP (DT 66) historic district, are included in Chapter 5, *Survey Results*.

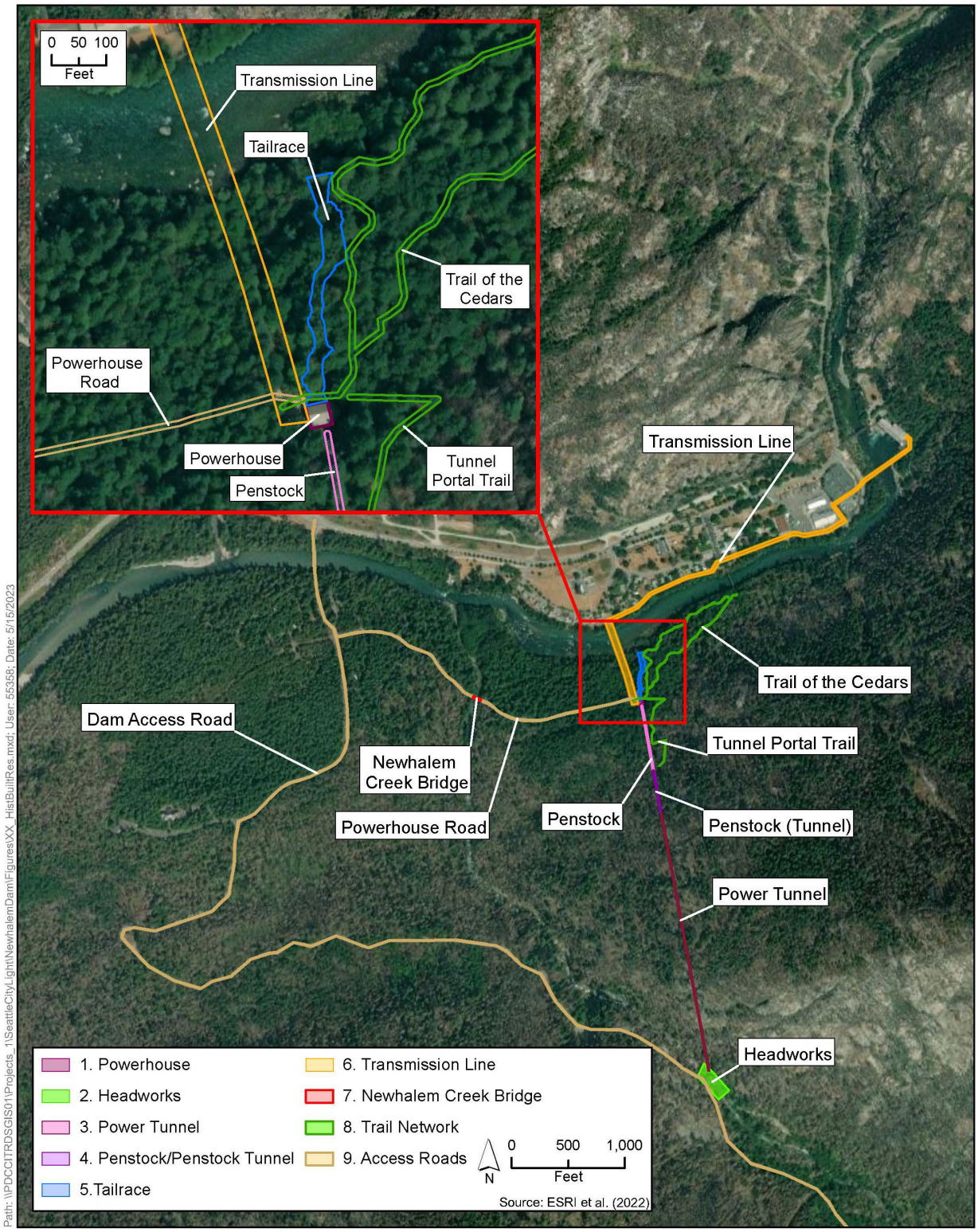
Table 1. Historic Built Resources Identified for Survey

Map ID	HPI Property ID	Property Name, Address	Property Type	Year Built	NRHP Status
1	729310	Powerhouse, Vicinity Newhalem, Whatcom County, WA	Building	1969	Previously individually unevaluated. Contributing to SRNCHP (DT 66) in 2010 NRHP Nomination update.
2	729311	Headworks, Vicinity Newhalem, Whatcom County, WA	Structure	1969	Previously individually unevaluated-dam only. Contributing to SRNCHP (DT 66) in 2010 NRHP Nomination update.
3	729312	Power tunnel, Vicinity Newhalem, Whatcom County, WA	Structure	1921	Previously individually unevaluated. Contributing to SRNCHP (DT 66) in 2010 NRHP Nomination update.
4	729313	Penstock, Vicinity Newhalem, Whatcom County, WA	Structure	1921	Previously individually unevaluated. Contributing to SRNCHP (DT 66) in 2010 NRHP Nomination update.
5	729314	Tailrace, Vicinity Newhalem, Whatcom County, WA	Structure	1921	Previously unevaluated.
6	729315	Transmission line, Vicinity Newhalem, Whatcom County, WA	Site	1965	Previously unevaluated.

Map ID	HPI Property ID	Property Name, Address	Property Type	Year Built	NRHP Status
7	729316	Newhalem Creek Bridge Vicinity Newhalem, Whatcom County, WA	Structure	1968	Previously unevaluated.
8	730063	Trail Network, Vicinity Newhalem, Whatcom County, WA	Site	c. 1920–1987	Previously unevaluated.
9	730064	Access Roads, Vicinity Newhalem, Whatcom County, WA	Site	c. 1919–c. 1969	Previously unevaluated.

HPI = Historic Property Inventory; WA = Washington; c. = circa; NRHP = National Register of Historic Places; SRNCHP (DT 66) = Skagit River and Newhalem Creek Hydroelectric Projects historic district

Figure 3. Locations of historic built environment resources in the APE



Chapter 3
Historic Context

This chapter provides a historic context for the APE and vicinity, which includes early 20th century trends in the development of hydroelectric power in Washington, the development of hydropower by City Light in the Skagit River watershed, the planning and construction of the Newhalem Creek Hydroelectric Project, and a comparison of similar hydroelectric power facilities in Washington.

3.1 Hydroelectric Power Facilities—What They Are and What They Do

3.1.1 Foundational Technological Advances

Technological advances in electric power in the late 19th century were foundational to the development of hydroelectric power. Key technological developments in power generation and infrastructure developed in the 1870s elevated electric power to rival existing forms of power production in the United States, including natural fuels and fossil fuels, such as wood, coal, oil, gas, and manufactured/refined fuels, such as kerosene and manufactured gas (Allen et al. 2020:3-2–3-3, 3-7–3-10). These advancements included the widespread commercialization of arc lamp lighting, first developed by Humphry Davy in the early 19th century, Thomas Edison's successful commercial development of the incandescent light bulb in 1879, and the development of power-generating turbines developed by Charles F. Brush in 1878, which produced direct current (DC) power that could be distributed via conductors to load centers (Allen et al. 2020:3-7).

By the mid-1880s, over 400 private electrical plants were in operation across the country. However, these plants were almost all steam powered, produced DC power within a limited distribution range, and were typically located in towns and cities no more than 10 miles from consumption centers (Soderberg 1988a:E-1). The earliest uses of water for electrical generation were likewise constrained by the technological limitations of Brush turbines and DC transmission. Typically consisting of single turbines, these early facilities provided power at a small scale to individual sites and their vicinity. Early examples include a water-driven turbine developed by the Excelsior Water and Mining Company in Nevada County, California in 1879 that powered three 3,000-candlepower arc lamps; the use of a Brush dynamo driven by a water turbine in Grand Rapids, Michigan in 1880 to provide theater and storefront illumination; a Brush dynamo connected to a flour mill at Niagara Falls, New York in 1880 that powered city street lamps; and the Vulcan Street Plant in Appleton, Wisconsin in 1882, the first hydroelectric plant to use Edison's DC system (Allen et al. 2020:3-11; USBR 2016).

Long-range transmission of electric power remained a key obstacle for the widespread adoption of electric power, as DC transmission was limited to short distances (Allen et al. 2020:3-7). However, the advent of alternating current (AC) systems in Europe in the 1870s and its further refinement in the United States in the 1880s, coupled with the invention of the transformer, solved the problem of long-range transmission (Allen et al. 2020:3-2–3-11; Soderberg 1988a:E-1) The AC system allowed for the increase of transmission voltage, while reducing the line current and size of conductors with

a minimum of power loss from line resistance (Soderberg 1988a:E-2). The invention of the transformer was likewise critical, as this technology stepped up voltage between the power site and load center, and then stepped it down prior to distribution (Soderberg 1988a:E-2). Taken together, these technologies made it possible to phase and step power along transmission corridors to maintain voltage levels over increasingly long distances, while reducing power loss in transmission and the costs of transmission infrastructure (Allen et al. 2020:3-2–3-11; Soderberg 1988a:E-2).

The first AC hydroelectric power plant in the United States was constructed in 1889 on the Willamette River in Oregon City, Oregon, by the Willamette Falls Company (later Portland General Electric) and successfully transmitted single-phase power 13 miles to Portland at 4,000 volts, stepped down to 50 volts for transmission (USBR 2016). Several two- and three-phase AC hydroelectric plants were constructed in Colorado and California in the early 1890s, the voltage produced by these plants ranged from 3,000 to 11,000 volts, comparatively low to the large-capacity plants that would follow (USBR 2016). The development of high efficiency, large-capacity polyphase hydro turbogenerator units allowed for the scaling of hydroelectric power (Soderberg 1988a:E-1–E-2). This technology was first implemented and proven at Niagara Falls in 1895, where a plant with three 5,000-horsepower (approximately 3,729 kilovolt amperes [kVA]) generators were installed (Soderberg 1988a:E-1–E-2). When coupled with the improved range of AC distribution, the Niagara Falls plant demonstrated the economic advantages of locating power plants at the source site, miles from consumption centers (Soderberg 1988a:E-2). This proof of concept had immense implications for hydroelectric power generation in the West, where hydroelectric facilities could now take advantage of the region's mountainous river systems and transmit power over longer distances to consumption centers.

3.1.2 Characteristics of Hydroelectric Power Facilities

Hydroelectric power is a type of electric power generation that is characterized by the use of moving water to propel a turbine. The mechanical energy produced by the rotating turbine powers an electrical generator. Generated energy is then transmitted to a central load center and distributed out to consumers.

Hydroelectric power facilities typically have the following components.

- Reservoir
- Dam
- Intake structure
- Water conveyance system, such as canals, pipeline, penstocks, and power tunnels
- Pressure regulators, such as standpipes and surge tanks
- Powerhouse and generating equipment
- Tailrace
- Transmission system, including transmission lines, transformers, and substations

Though separate components, reservoirs, dams, and intake structures work together to contain and introduce water into a hydroelectric system. Reservoirs for early hydroelectric facilities were located either at the beginning or end of a water conveyance system, depending on the water source and intervening terrain between it and the powerhouse, with smaller reservoirs located

immediately upstream of a powerhouse referred to as forebays (Soderberg 1988a:F-6). Though the construction of reservoirs can require their own engineered components, in most cases the engineering involved is primarily the survey, soil testing, and hydraulic studies of a watershed, and tree removal is the only physical construction activity to occur. In these cases, the construction of a dam allows for the natural topography upstream of the dam to fill with water (Johnson 2010:7-2–7-3).

Dams related to hydroelectric facilities were constructed with a variety of materials and in various forms over the course of the late 19th and 20th centuries. In the early period of hydroelectrical development dams were commonly timber structures, consisting of stacked wood logs or log cribs filled with rock and earth, with sluices (openings) between the logs that allowed excess water to flow through, or embankment dams composed of compacted layers of soil or rockfill (Soderberg 1988a:F-6). Embankment dams are not commonly associated with hydroelectric power in the western United States, because they are usually constructed in wide valleys abutted by flat slopes but are adaptable to other sites where the force of water is not exceedingly high (CivilDigital.com 2017). By the 1920s, the construction of masonry and concrete dams, later reinforced with steel, became prevalent (Soderberg 1988a:F-6). These new materials allowed for more highly engineered dams optimized for their specific site conditions. Common types of these dams include gravity dams, which are designed to hold large volumes of water and well suited for blocking rivers as the weight of water is transferred to dam foundation and the abutting bedrock; arch dams, which deflect the water pressure to the abutments and are ideal for narrow canyons where the abutting bedrock is strong; and buttress or hollow dams, which have an impervious upstream side supported by a series of buttresses or supports downstream to further support the dam where site foundations are weaker (CivilDigital.com 2017). The headworks of the Newhalem Creek Powerhouse and Dam Complex (NCPDC) consists in part of a simple curved concrete diversion dam, while the Gorge High Dam and Diablo Dam are examples of combination constant-angle arch and gravity dams, and the Ross Dam is a variable arch dam (Johnson 2010:7-32; 7-40; 7-44; 7-51).

Intake structures introduce water into the hydroelectric system (Soderberg 1988a:F-6). Intakes may be a component of a dam (in which case the combined dam and intake structure is referred to as a headworks) but can also be constructed on a reservoir separate from a dam. The design and components of intake structures can vary greatly depending on the water source, the difference in elevation and distance between a water source and the point of power generation, and the type and engineering of associated water conveyance components (Bratko and Doko 2013:983–996). All intake designs will include a trash rack, which prevents debris from entering the system, and may include secondary components, such as a sluiceway, which diverts water from a river or creek, service gates that regulate water flows and prevent hydraulic loss, or an air vent that regulates air and water pressure within the intake (Bratko and Doko 2013:988).

Water conveyance systems transport water from the intake to the powerhouse. Late 19th century and early 20th century water conveyance systems typically consisted of timber flumes for shorter distance systems, though canals were also used in conjunction with flumes for particularly long conveyance systems. By the early 1900s, metal pipelines became the primary method of conveying water over long distances, with short distance pipelines referred to as penstocks. The advent of electrical drill equipment in the 1920s and directional boring in the 1930s made it economically and technically feasible to build increasingly larger and longer power tunnels through solid rock, rather than constructing circuitous conveyance systems. However, the need for some form of water conveyance required certain design precautions to prevent velocity surge in power tunnels and

pipelines. Pressure regulators, such as standpipes and surge tanks helped to alleviate high pressure within these closed water conveyance structures. Tailraces—the canal, channel, or pipeline that carries water out of the hydroelectric system, either away from a powerhouse or dam—could be considered a type of water conveyance infrastructure. However, they are typically considered separate components because of their function and location at the end of hydroelectric facilities (Soderberg 1988a:F-2, F-5–F-6).

Powerhouses contain the equipment that generates power from the water brought through hydroelectric facilities. Water moves through the turbine unit(s), creating mechanical energy that is transferred to a generator unit. Water then exits the turbine through a discharge chute and flows out into the tailrace. During the early period of hydroelectric development, the scale of powerhouse buildings was typically larger for facilities constructed by private utility companies than municipal utilities, as these companies had the capital available to invest in high initial capacity. Publicly developed facilities were often added on to as a facility's capacity was increased in response to public demand for expansion and further investment. The earliest powerhouses were smaller wood-framed structures, while later larger powerhouses were built of brick, steel, or reinforced concrete. Larger powerhouses became more prevalent as the scale of hydroelectric projects increased in the early 20th century and often displayed architectural influences of the periods in which they were built. While the architecture of early 20th century powerhouses was commonly more restrained, befitting the buildings' utilitarian function, examples from the 1920s onward more fully express their style and include more elaborate details, reflecting changing attitudes toward the public benefit of investment in large-scale hydroelectric projects (Soderberg 1988a:F-3).

The NCPDC powerhouse, and Gorge, Diablo, and Ross powerhouses reflect these evolving trends in powerhouse architecture. The original 1921 NCPDC powerhouse was a rustic wood-framed building with board-and-batten siding, a corrugated metal roof, and a series of wood windows along its north façade, reflecting its purely utilitarian nature and forested environment (City Light 1919a). The NCPDC powerhouse, as well as the design of some other City Light buildings throughout the SRHP were influenced by U.S. Forest Service (USFS) and NPS variations on rustic-style architecture, which was deemed most compatible with the remote settings of these agency buildings (Johnson 2010:7-57). The design of the current NCPDC powerhouse, built in 1969, was meant to evoke the 1921 powerhouse's design, matching the 1921 building's general design elements in its fenestration pattern and exterior cladding, though it doubled down on its use of wood materials for added decorative effect in its hand-split cedar-shake roof and exposed rafter tails (City Light 1969e). The replication of the original rustic design elements and the use of rough timber in its construction was specifically requested by NPS to preserve some the facility's historical value and increase its compatibility with its forested environment (City of Seattle 1969:27-28). Conversely, the designs of the Gorge, Diablo, and Ross powerhouses reflect the increasing scale of investment and engineering in their construction, as well as their auxiliary function as showpieces of City Light's success as a municipal utility during an era in which private utility companies predominated. The Neoclassical design of the Gorge Powerhouse, built in 1924, is restrained, expressed in its ten bays of tall multi-paned industrial sash windows, concrete piers with ornamental capitals, concrete cornice, smaller paired multi-paned windows along its attic story, and projecting corner bays with windows recessed in an arched niche, giving the corner bays the illusion of towers. The 1949 addition to the building aligned with City Light's growing capacity and power needs and with the original stylistic treatment (Johnson 2010:7-28). The Diablo Powerhouse, completed in 1936, exhibits characteristics of the Moderne style, though still in a slightly muted interpretation of the style. The building's Moderne characteristics include its sleek unfished concrete exterior broken by projecting concrete piers that

rise above the roofline to form a crenulated parapet and expansive window banks of multi-paned steel sash windows (Johnson 2010:7-34). The powerhouse's interior is more ornamental, with a full height lobby floored in terrazzo tile, curved staircase, a tiled fountain, and fishpond, and 1930 City Light logo laid in mosaic tile (Johnson 2010:7-35). Though the Ross powerhouse was the last to be constructed, it is arguably the most architecturally restrained of the three Skagit River powerhouses, in part due to its employment of the International Style, as well as its remote location upriver and lesser use for promotional purposes. The building's International Style elements include its monolithic concrete block form banded with slim horizontal windows (Johnson 2010:7-50).

Turbine equipment installed in a powerhouse was dependent on prevailing technologies and the hydraulic needs of the facilities. Hydroelectric facilities in the eastern United States made use of traditional water wheels and reaction turbines, which generated power from the pressure of applied to a runner placed directly in the water stream, allowing water to flow over the blades rather than striking each individually ((Soderberg 1988a:E-4; U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy n.d.). Early facilities in the West typically used impulse turbines, which consisted of a twin bucket arrangement with curved bottoms, inclined sides, and a raised center ridge that divided an incoming water jet. The turbines operated through tangential direction of water under high pressure against the blade edges, which caused the turbine to rotate rapidly and generate power. In the early decades of the 20th century, the refinement of the Francis turbine, a type of reaction turbine first developed by James Francis in 1848, led to the widespread adoption of this type of reaction turbine in the western United States (Soderberg 1988a:E-4, F-3–F-4). Whereas the Pelton Water Wheel Company (PWWC) double-nozzle impulse-type waterwheels installed in the NCPDC powerhouse were oriented vertically, refined Francis turbines were able to be oriented horizontally and allowed generators to be oriented vertically, which improved power capacity through increased connectivity between the turbine and generator (Soderberg 1988:F-5).

Hydroelectric generators produce power by converting the mechanical energy created by turbines into electricity through the circulation of electromagnets on a turbine rotor past field poles (stacks of magnetic steel laminations) mounted around the perimeter of the rotor in the generator (Water Science School 2018). Several types of electric generators had been developed by the early 20th century, such as the Brush dynamo and Westinghouse Electric Company AC generator. The primary issue with adapting these technologies to water turbines was reconciling the rotating speeds and the position of the turbines and generators (Soderberg 1988a:F-5). Prior to 1920, the common solution was to place the generator in a horizontal position with shafts connected to vertical wheels. The development of the Kingberry bearing allowed for the generator to placed vertically in conjunction with horizontal turbines to improve efficiency, known as the "Niagara solution," for the first instance of its implementation at the Niagara Falls plant in New York (Soderberg 1988a:F-5).

Transmission systems include all components that carry power from its point of generation to distribution. These components include transmission lines, consisting of insulated wires or cables that carry power; towers or poles to carry the cables; transformers that increase or decrease voltage; protective devices, such as circuit breakers, relays, communication, and control systems; and switchyards, substations, and load centers from which power is distributed to consumers. The construction methods and configuration of these components for aboveground transmission have largely been consistent since the early 20th century, though individual components and technologies and materials have been improved. The undergrounding of transmission cables became common in the latter half of the 20th century, which involved trenching and burial of

transmission lines rather than the construction of overhead lines. (Faizan Sheikh 2023; Soderberg 1988a:F-6).

Hydroelectric power facilities are generally characterized as either low head or high head systems, referring to the volume of water used for power generation and the vertical drop of water from its source to the power generating equipment. Low head systems are operated by a high volume of water dropping less than 200 feet. To operate, low head systems create pondage at the point where the water is used, allowing for the passage of large volumes of water through a short water conveyance system to the turbine units. Conversely, high head systems are operated by a low volume of water that drops over 200 feet. As such, Washington's hydroelectric facilities are typically high-head systems, as its major water sources are low-volume rivers in mountainous areas. Different types of turbines and generator units are needed to operate under various head conditions and are dependent on the volume of the water source and velocity of water conveyance through the system. While the major components of both low and high head systems typically include a reservoir, dam/intake structure, pressure regulators, powerhouse, and transmission system, the designs of these individual features vary to suit the particular head of the system. For example, high heads typically require a longer and separate water conveyance system. (Soderberg 1988a:F-2).

3.2 Development of Hydroelectric Power in Washington

As hydroelectric power generation and transmission became proven technologies in the late 19th century, control of the development and distribution of hydroelectric power became a contentious competition between private companies and public agencies during the first half of the 20th century, with public agencies increasing their regulatory authority and investment in hydroelectric power markets against private developer resistance. The establishment of the Northwest Power Pool (NPP) in 1942 ushered in an era of cooperation between private and public utilities in the Pacific Northwest, a turning point that came after a decade of increased regulation of private companies and a new and substantial federal role in the development of hydroelectric facilities and power distribution. Beginning in the 1970s, new environmental policies and changing regulations presented new challenges for hydroelectric production and complicated the relationship between private and public utilities, trends that continue today.

3.2.1 Private Utility Hydroelectric Development in the Pacific Northwest and Washington (1880–1942)

In the American west, private electric companies proliferated in the 1880s and 1890s, but soon merged into several larger firms to consolidate their market share and territories by the early 20th century. In the Pacific Northwest, the major firms included the following:

- Portland General Electric Company, formed in 1892 with service in Oregon (Company-Histories.com. 2022b).
- Washington Water Power Company (WWPC) (now Avista), formed in 1899 with service in Washington (Kershner 2016b).

- Pacific Power & Light Company (PPLC) (now PacifiCorp), formed in 1910 with service in Washington and Oregon (Kershner 2016b).
- Puget Sound Traction, Power & Light Company (later Puget Sound Power & Light Company [PSPLC], and now Puget Sound Energy), formed in 1912 with service in Washington (Soderberg 1988a:E-9; Caldbick 2015).
- Idaho Power Company (IPC), formed in 1915 with service in Oregon and Idaho (Company-Histories.com 2022).

The first documented use of hydroelectric power in Washington was by George A. Fitch in Spokane, Washington in 1885. Fitch installed a Brush arc dynamo turbine in a flour mill and illuminated 11 arc lights in the surrounding business district. In 1886 the Edison Electric Illuminating Company of Spokane Falls (EEICSF) bought Fitch's mill and installed an Edison electric-lighting plant on Post Street. A competing power company, WWPC, was incorporated in Spokane in 1889 and had built its first power station in 1890 at the Lower Falls of the Spokane River, the Monroe Street Power Station. In 1891, WWPC acquired a controlling share of the EEICSF and moved the generators from the EEICSF Post Street substation to the Monroe Street Power station. After it established itself as the premier power company in Spokane, the company began expanding into other applications of electric power, quickly acquiring the Spokane Street Railway in 1892. In 1901, the company sought to expand beyond Spokane, building transmission lines to the nearby town of Hillyard and negotiated with a Coeur d'Alene mining conglomerate to develop a hydroelectric site on the Spokane River where it emerges from Lake Coeur d'Alene in Post Falls, Idaho, to provide power to the Coeur d'Alene mines. The latter project involved the construction of a 100-mile transmission line to Burke, Idaho, likely the longest high voltage line in the world at that time. Over the next three decades, WWPC constructed four hydroelectric dams in eastern Washington and western Idaho on the Spokane River, among them: Post Falls Dam (1906) in Post Falls, Idaho; Little Falls Dam (1910–1911) in Lincoln County, Washington; Long Lake Dam (1915) in Lincoln County, Washington; and the Upper Falls Dam in Spokane, Washington (1922). Additionally, WWPC constructed the Chelan Lake Dam on the Chelan River in 1927. (Kershner 2016b).

The first hydroelectric project in western Washington was built in 1898 at Snoqualmie Falls on the Snoqualmie River in Snoqualmie, Washington by the Snoqualmie Falls Power Company (a predecessor firm of the PSPLC) (Crowley 1999; Crowley 2000). This was followed shortly by the Whatcom County Railway and Light Company Nooksack Falls plant in 1903 and Puget Sound Power Company Electron plant on the Puyallup River in 1904, which distributed power to Tacoma and Seattle via a 48-mile transmission system (Soderberg 1988a:E-6). The 1912 consolidation of Seattle Electric Company (SEC), the Seattle-Tacoma Power Company, the Pacific Coast Power Company, the Puget Sound Power Company, and the Whatcom County Railway and Light Company into Puget Sound Traction, Power and Light Company by the Boston, Massachusetts-based holding company of Stone & Webster, was a major turning point for private power development in western Washington, as it gave the newly incorporated firm control of facilities and distribution networks from Bellingham to Tacoma (Soderberg 1988a:E-9). These early hydroelectric facilities were often developed to produce power for private electric-powered transportation systems that were being developed in urban areas, rather than for commercial sale (Soderberg 1988a:E-6–E-7). Such facilities include the Snoqualmie Falls plant (1898), Nooksack Falls plant (1903), the Electron on the Puyallup River (1904), the Nine Mile plant on the Spokane River (1908), and the White River plant (1911) (Soderberg 1988a:E-6).

Private electrical companies in the Puget Sound region had stronger competition from municipal agencies than their eastern Washington counterparts in the early 20th century. While private companies retained substantial market shares in transportation and heating sectors until mid-century, the municipal utilities of Seattle and Tacoma were the primary service provider of water and electric utilities in these cities by the 1910s (Crowley 1999). However, private companies did develop hydroelectric facilities outside of the Seattle-Tacoma region, providing electricity to smaller developing cities in southwest and northwest Washington. PPLC constructed three dams on the Lewis River in southwest Washington during the mid-20th century: the Merwin Dam (1931) and Yale Dam (1953) in Clark County and Cowlitz County and the Swift Dam in Skamania County (1958) (PacifiCorp 2022). In northwestern Washington, PSPLC constructed two dams on the Baker River: the Lower Baker Dam (1925) in Skagit County and the Upper Baker Dam in Whatcom County (1959) (PSE 2022). To better compete with public utilities, Washington's private utilities moved toward integration of its distribution infrastructure as early as 1917, when PPLC and WWPC interconnected their systems; by 1941 regional integration had expanded to include Northwestern Electric Company, Montana Power, Idaho Power Company, and Utah Power and Light under a partnership called Northwest Interconnected Systems. (Kershner 2016b).

In the 1930s, private utilities faced a major challenge in the form of the Public Utility Holding Company Act of 1935 (PUHCA), passed in response to the Federal Trade Commission's 7-year investigation of the private electric industry that revealed a depth of financial corruption by the holding companies and the difficulty of effectively regulating the industry at the state level (EIA 1993:1-5). The Wall Street Crash of 1929 and its aftermath only raised the political salience of these issues as many of the country's largest private utility companies went bankrupt by the early 1930s, resulting in substantial service disruptions (Kershner 2016b). The PUHCA effectively broke up large holding companies that controlled many of the country's regional power companies and increased the ability of states to regulate the financial organization and operation of private utility companies. Utility companies were required to limit their operation to within a single state, thus overcoming issues related to federal preemption in regulating companies involved in interstate commerce and prevented holding companies engaged in regulated businesses from engaging in separate unregulated businesses (EIA 1993:9-11). Challenges to the legality of the PUHCA led to over a decade of litigations, but by 1950 the majority of holding companies had been reorganized to comply with the law (EIA 1993:12).

3.2.2 Public Utility Hydroelectric Development in Washington (1893–1942)

Since the late 19th century, Washington has been a leader in municipally owned utilities. Public utilities operated by the cities of Tacoma and Seattle were some of the earliest established municipal utilities in the Pacific Northwest. These utilities included Tacoma Power and Tacoma Water in 1893 (now Tacoma Public Utilities), Seattle Department of Light and Water in 1890, which split into the Department of Water (now Seattle Public Utilities) and Department of Lighting (now City Light; discussed in detail below) in 1910 (Crowley 1999; Crowley 2000; Wilma 2003b). The first municipally developed hydroelectric project in the region was on the Cedar River, the Seattle Municipal Light and Power Plant, constructed between 1902 and 1904 by the Seattle Department of Water and Light (Johnson 2010:8-37). City Light would later construct the NCHP and SRHP (consisting of the Gorge Powerhouse and Dam Complex [GPDC], Diablo Powerhouse and Dam Complex [DPDC], and Ross Powerhouse and Dam Complex [RPDC]) from 1919 to 1961, which

remained Seattle's largest single power source until the agency completed the Boundary Dam on the Pend Oreille River in 1967 (MacDonald 2018). The first Tacoma Power hydroelectric facility, the LaGrande Dam on the Nisqually River, was completed in 1912 (Wilma 2003a). Over the course of the 20th century, Tacoma Power developed a second complex of hydroelectric facilities—the Cushman Hydro Project on the North Fork of Skokomish River consisting of the Cushman No. 1 (1925) and Cushman No. 2 (1930) dams—and redeveloped the Nisqually River Project, rebuilding the LaGrande Dam and constructing the Alder Dam in 1945 (Tacoma Public Utilities 2022).

In rural areas of Washington, public utility districts (PUDs) became common public organizations created to provide water and electricity services to rural customers during the 1930s and 1940s. The effort to establish state-level legal frameworks for PUDs was started in 1929 by the Washington State Grange (WSG), an agricultural civic organization. That year, WSG petitioned to send Initiative No. 1 to the Washington State Legislature, which would allow rural communities to form their own publicly owned utilities that would be funded through membership dues and usage rates for utility services. As the legislature failed to act on WSG's initiative, it was passed by statewide popular vote in 1930 and went into effect in 1931. The 1931 law, titled "Power and Water Districts," authorized the establishment of public utility districts responsible for the conservation and distribution of water and power resources in Washington to the public within their respective jurisdictions. The legality of PUDs was challenged by private utility companies in the early 1930s, but the Washington State Supreme Court upheld the 1931 law in 1936. Following the court ruling, PUD commissioners from across the state met to form the Washington Public Utility District Association (WPUDA), a lobbying and policy organization representing PUDs at state, region, and national levels. The court ruling and formation of WPUDA led to widespread organization of PUDs across rural Washington, with 23 PUDs operating by 1940. (Caldbick 2014; WPUDA 2022).

Contemporaneously, two federal actions further supported the development of PUDs to build and manage electricity distribution infrastructure in rural areas. The Rural Electrification Administration (REA) was established in May 1935 by President Roosevelt through executive order. The Rural Electrification Act of 1936 was passed the following year, providing funding for the REA and its lending programs for the construction of electricity infrastructure in underserved rural areas. However, commercial utility companies viewed rural areas as lacking profit potential and were reluctant to pursue federal funds for service expansion projects in these areas. Rather, applications for REA loans came predominantly from rural cooperatives, such as PUDs. (NRECA 2022).

Supported by the preference clause in the federal Bonneville Power Act of 1937, PUDs developed a close relationship with the Bonneville Power Administration (BPA) in developing their own sources of hydroelectric power during the mid-20th century, and several Washington PUDs would become members of the BPA-led NPP (discussed in detail below).

3.2.3 Federal Hydroelectric Development (1902–1942)

Federal agencies also became significant developers of hydroelectric facilities during the early 20th century. The United States Reclamation Service (now the Bureau of Reclamation [USBR]) was established in 1902 through the Reclamation Act of 1902. While tasked primarily with water resource management and public irrigation projects, USBR built many hydroelectric facilities as part of major Pacific Northwest projects. USBR hydroelectric facilities were constructed primarily to service construction activities of the larger USBR project under development; however, following construction, surplus power produced by these facilities was sold to existing power distribution

systems in the area. For instance, USBR's first hydroelectric plant, the Theodore Roosevelt Dam constructed in 1909 on the Salt River 75 miles northeast of Phoenix, Arizona, ultimately provided power for all residential and commercial power in the city during the early 20th century in addition to pumping irrigation water to the surrounding area. (USBR 2016).

To a lesser degree, the U.S. Army Corps of Engineers (USACE) was also involved in hydroelectric projects in the early 20th century, stemming from authorities granted to the agency in the Rivers and Harbors Acts of 1890 and 1899 and the General Dam Act of 1906. However, during this period, USACE hydroelectric projects were primarily located in the eastern United States. The Flood Control Acts of 1928 and 1936 expanded the USACE's involvement in private and state and local government dam projects, and the Flood Control Act of 1944 authorized the agency to sell power produced by USACE projects, leading the agency to become significantly more involved in the development of major hydroelectric projects. (USACE 2022).

In the 1930s, two specific hydroelectric projects in the Pacific Northwest, the Bonneville Dam spanning the Columbia River between Washington and Oregon and the Grand Coulee Dam on the Coulee River in central Washington, led to the creation of a new federal agency (BPA) to manage the sale and distribution of power produced by these projects. Leading up to the completion of the Bonneville Dam, disputes arose between private power companies and Washington PUDs over control of the power the project would produce. The Bonneville Project Act of 1937 was passed to resolve this issue, establishing BPA to oversee the sale and distribution of power produced at the Bonneville and Grand Coulee dams. The act also included three elements that were influential on future federal projects in the Northwest. First, the act's "preference clause" directed BPA to prioritize public utilities and cooperatives (such as PUDs) in delivering electricity. Second, it established uniform fixed rates for BPA power regardless of the distance that power was transmitted from its source, referred to as "postage stamp" rates in reference to similar fixed postage rates for the United States Post Service. Third, revenue from the sale of power generated by the two projects would be used to repay the costs of government construction of the dams and finance their future operation. While these elements led to increased public construction of dams that supplied power to the BPA system in the decades that followed, the fixed rate and construction financing requirements also led to repeated budget deficits for BPA, perpetuating political disputes over the agency and its role in hydroelectric power development and distribution in the Pacific Northwest. (Tate 2015).

3.2.4 Public–Private Partnerships in Hydroelectric Power (1942–1970)

The onset of World War II and the surge in demand for electricity for the Pacific Northwest's aluminum, aircraft, and shipbuilding industries centered in Portland, Tacoma, and Seattle, ushered in a new era of public–private partnerships in hydroelectric power generation and distribution in the region. In 1942, the federal government directed the BPA to organize the region's private and public power utilities into a voluntary comprehensive power pool. NPP, as the organization became known, included the six private companies already integrated into the Northwest Interconnected System—PPLC, WWPC, Northwestern Electric Company, Montana Power, Idaho Power Company, and Utah Power and Light—as well as PGE and PSPLC and the public utilities Tacoma Power and City Light. The public-private partnership of the NPP proved to be successful and beneficial to its members during the war, as it afforded greater backup flexibility during low stream flows and increased efficiency across its constituent systems. In the decades after, the NPP continued to

expand both in its membership and infrastructure capacity. Two PPLC mergers brought additional utilities representing Wyoming and northern California into the NPP: the first in 1954 with Mountain States Power Company, and the second in 1961 with the California Oregon Power Company. This was followed by more additions during the 1960s, among them Eugene Water and Electric Board in Eugene, Oregon, Kootenay Power and Light in British Columbia, Canada, and several public utility districts in Washington. As the network expanded, so did demands for its electricity, almost all of which was produced by hydroelectric facilities. During the 1950s, 18 new hydroelectric projects were under construction across member states to meet expanding power demands in the growing region. (Kershner 2016a).

In practice, the NPP merged the private and public projects into one utility system, though individual generating facilities and distribution infrastructure all remained managed and operated separately by members. In addition to the benefits of efficiency and reduced costs for members, the expertise and relationships developed over the course of two decades positioned the NPP to be an integral part of negotiations for the Columbia River Treaty between the United States and Canada in the early 1960s (Kershner 2016a). As part of negotiation, members of the NPP, BPA, and USACE signed the 1964 Pacific Northwest Coordination Agreement, a concurrent and more comprehensive 39-year agreement among members that positioned the NPP to be the designated United States utility to work with the Canadian government on implementing the stipulations of the treaty (Kershner 2016a). Signed in 1964, the Columbia River Treaty stipulated that the United States would compensate the Canadian government for the construction of three storage dams on the upper Columbia that would contain almost half of the water storage of the entire Columbia system, provide improved flood control, and allow for the optimal regulation of water flows for power generation at United States hydroelectrical facilities on the lower Columbia, from which Canada would be given half of all surplus power generated (Kershner 2016a). Also passed in 1964 was the Pacific Northwest–Pacific Southwest Intertie (PNPSI), which funded the interconnection of the NPP and BPA's integrated distribution network with the whole of California's distribution network. However, the bill included a provision that only power that was not needed in the geographic area comprising the Columbia River watershed could be sold outside the region. Even with that provision included the combination of the Columbia River Treaty and PNPSI helped to alleviate some BPA financial issues and strengthened the marketing position of the NPP as a whole (Tate 2015).

As members of the NPP (Chelan County PUD, Grant County PUD, and Douglas County PUD) or supported by the 1937 Bonneville Power Act preference clause, PUDs began operating a number of Washington hydroelectric facilities during the second half of the 20th century, either by acquiring existing hydroelectric facilities from their private utility partners in the NPP or by constructing their own. PUD-operated facilities that were acquired from private companies included the following.

- Lake Chelan Hydroelectric Power Plant on the Chelan River in Chelan County, Washington, constructed by the Washington Water Power Company in 1927 and acquired by Chelan PUD in 1955 (Kershner 2016; CCPUD 2017a).
- Rock Island Dam on the Columbia River in Chelan County and Douglas County, Washington, constructed 1930-1932 by Puget Sound Power & Light Company, and acquired by Chelan PUD circa 1951 with additional units and powerhouse expansion constructed from 1951–1953 (CCPUD 2017b).

PUD-constructed hydroelectric facilities in Washington included the following.

- Box Canyon Dam on the Pend Oreille River in Pend Oreille County, Washington, constructed from 1952–1956 by Pend Oreille PUD (POPUD 2022).
- Rocky Reach Dam on the Columbia River in Chelan County and Douglas County, Washington, constructed from 1956–1961 and 1969–1971 by Pend Oreille PUD (CCPUD 2017c).
- Priest Rapids Dam on the Columbia River in Grant County and Yakima County, Washington, constructed from 1956–1959 by Grant County PUD (GCPUD 2022).
- Wanapum Dam on the Columbia River in Grant County and Kittitas County, Washington, constructed from 1959–1963 by Grant County PUD (GCPUD 2022).
- Wells Dam on the Columbia River in Douglas County and Chelan County, Washington, constructed from 1963–1969 by Douglas County PUD (DCPUD 2022).

3.2.5 New Challenges and Changing Priorities (1970–Present)

The latter decades of the 20th century brought new challenges to the region's hydroelectric producers in the form of new environmental priorities for conservation and other forms of renewable energies and deregulation that renewed market competition between private and public producers. Low water runoffs in the 1970s led to the NPP becoming the face of power conservation campaigns. During the winter of 1976 and 1977, the region experienced the lowest runoff ever recorded, and NPP Director Merrill Schultz went on regional television to urge power conservation and a reduction in holiday lighting to protect the region's production capacity. A different form of conservation priorities arose a few years later in the form of the Pacific Northwest Power Planning and Conservation Act. More commonly known as the Northwest Power Act (NPA), the act was passed in 1980 partly in response to precipitous drops in fish populations in the Northwest's major rivers and the addition of several species to the endangered species list. The NPA had profound effects on the operation of dams and hydroelectric facilities in the region, as power producers were tasked with considering migration of fish species as a priority superseded only by flood control, rather than simply managing river flows for optimal power generation. (Kershner 2016a).

The NPA revised and expanded BPA's mandate specifically by adding conservation elements, reprioritizing federal sources for meeting energy demands toward renewable energy, such as wind and solar, and charged BPA with mitigating adverse effects on fish and wildlife from its Columbia River dams (Tate 2015). While BPA's conservation projects had a demonstrative beneficial effect on Columbia River fish populations, these additional programs further exacerbated the administration's long-running financial issues and contributed to agency cuts to staffing, deferred maintenance of existing infrastructure, and the cancelation of further conservation efforts and new projects in the late 20th century (Tate 2015). The conservation efforts of the 1980s and 1990s were further codified in the 1997 revisions to the 1964 Pacific Northwest Coordination Agreement, with emphasized improved accommodations for fisheries among the major revisions (Kershner 2016a).

In recent decades, Tribes in Washington and elsewhere in the Pacific Northwest advocated for the removal of dams and collaborated with the state and federal agencies to restore natural hydrological systems and fish habitats as part of their conservation efforts, including the removal of large-scale dams on the Elwha, Nooksack, and Similkameen Rivers (Oregon Public Broadcasting 2020; The Pew Charitable Trusts 2020; Washington Environmental Council 2022). Related to these conservation efforts was over five decades of litigation between Tribes and Washington State agencies over the Tribes' fishing rights. This litigation culminated in a permanent injunction issued by the U.S. District

Court for the Western District of Washington (VanNess Feldman LLP 2013). The injunction was issued to ensure that Washington State would remove stream culverts that block fish passage to and from the Tribes' usual and accustomed fishing places and thus deprive the Tribes of the fishing rights reserved by the Stevens Treaties (WSDOT 2022). Removal of these barriers was to provide salmon with access to approximately 1,000 miles of additional stream habitat (VanNess Feldman LLP 2013).

Federal deregulation in the 1990s of the nation's power industry began to erode the spirit of cooperation between private and public hydroelectric power production that had characterized the previous five decades. The National Energy Policy Act of 1992 was designed to transition the industry to more competitive markets by requiring utilities to separate their transmission functions, generating functions, and power marketing operations. As a result of this disintegration of functions, long-standing practices of sharing information, such as sharing generation forecasts or the coordination of taking production facilities offline, between NPP members were abandoned over concerns of losing market advantages. (Kershner 2016a).

Deregulation also changed the organizational structure of the NPP. In 1995, members adopted the Membership Agreement, which formalized many of the previously voluntary arrangements of organization's committees (Kershner 2016a). In 1999, the Northwest Power Pool Service Corporation was incorporated, creating a separate trade association to provide services and professional training to member utilities and staffed by its own employees rather than member-lent employees. (Kershner 2016a). In February 2022, the Northwest Power Pool Service Corporation changed its name to the Western Power Pool to reflect the modern expansion of its footprint and operations (WPP 2022b). Today, it consists of 42 member utilities servicing areas from Alberta, Canada to Texas and as far east as western Iowa and Minnesota (WPP 2022a).

3.3 Seattle City Light in the Twentieth Century

3.3.1 Origins and Early Development

The precipitating event for the local push for municipal utility ownership in Seattle was the Great Fire of 1889, which burned a large swath of the city's business district on June 6 (Crowley 1999). In July 1889, voters approved bonds to buy and operate previously privately owned water utilities, and subsequently the city formed the Seattle Water Department (Crowley 1999). In the two decades from its inception in 1890 to 1910, the Seattle Water Department periodically explored options for leveraging its expanding water system on the Cedar River to produce electricity through a municipally owned hydroelectric facility. However, the city faced intense competition from private electric utilities, namely SEC, which operated the Snoqualmie Falls hydroelectric power plant. By 1900, SEC had consolidated most of the smaller firms in the area, effectively giving it a monopoly on hydroelectric generation and local distribution as well as control over the city's electric streetcar network (Johnson 2010:8-36; Caldbick 2015).

After the city's Cedar River water supply system was completed in 1902, the city passed a bond issue ordinance for the development of a municipally owned hydroelectric facility on the Cedar River (Johnson 2010:8-37). The measure passed largely due to growing dissatisfaction among Seattle residents with the private company monopoly on the power supply, coupled with the demonstrated success of the municipal water system. The Seattle Municipal Light and Power Plant,

commonly known as the Cedar Falls Hydroelectric Project, was constructed in phases between 1902 and 1914, and began producing electricity in 1904 (Johnson 2010:8-47; City Light 2022b). In 1905, the city acquired SEC's street lighting system and powered it with electricity generated by the Cedar River facility (Crowley 2000). Between 1905 and 1910, the city began to outcompete Puget Sound Traction, Power & Light Company both in lower consumer rates and footprint, expanding into suburban areas not served by SEC (Johnson 2010:8-37).

The Seattle Lighting Department (now City Light) was established in 1910, making it an independent municipal agency separate from the Water Department. The department's first superintendent, Richard Arms, was immediately assailed in the local press for his previous employment with SEC, the City's main competitor. Embattled mayor Hiram Gill, who had appointed Arms in 1910, was recalled in February 1911 following allegations of corruption, and Arms resigned following the recall election. In his place, the new mayor George Dilling appointed James Delmage (J.D.) Ross to lead the new department in 1911. (Johnson 2010:8-37–8-38, 8-62).

Ross, a self-trained engineer, had previously spearheaded the Water Department's forays in developing municipal electrical infrastructure and had broad support and a shared vision of public policy with Seattle's other Progressive-Era champions. Ross and others viewed municipal utility development as a piece of other broader public infrastructure developments including streets, parks, and schools that would make cities attractive to residents and businesses. Ross served as Superintendent of City Light until 1939. He also served conjointly on the Securities and Exchange Commission from 1935 to 1937, and then as the first administrator of BPA until his death in 1939. (Johnson 2010:8-38–8-39, 8-62).

In its early years, City Light faced an immediate challenge at the recently constructed Cedar Falls hydroelectric facility. Initially constructed as a rock-filled timber crib weir, the Cedar River dam had always been viewed as a temporary facility with untapped production potential. A new masonry dam project was pursued by City Light and completed in 1914, despite warnings from geoengineers that the site was unsuitable for such a project. Flooding incidents in 1915 and 1918, dubbed in the local press as the "Cedar Dam Blunder" and "Bowley Blowout," were political and operational setbacks for the young agency. The incidents were touted by critics as a failure of municipal ownership. Furthermore, these events put additional strain on the city's power supply during a period of increasing industrial demand, forcing it to install a new small hydroelectric plant at the Volunteer Park reservoir in Seattle and add an additional steam generator to its Lake Union Steam Plant, also in Seattle, as a backup system. Meanwhile City Light's attempts at developing an additional hydroelectric site were preempted by private utility acquisitions and court injunctions, first at the Hebb site on the White River and then Lake Cushman on the Skokomish River. In 1917, the agency was at risk of losing its third preferred site on the Skagit River, for which federal permits had already been issued to the Skagit Power Company, a subsidiary of City Light's primary private rival PSLPC. The onset of World War I and the surge in local industrial demand for power ultimately won City Light a superseding permit to develop the Skagit River for hydroelectric power after a year of political maneuvering for additional federal permits and fighting off legal challenges from PSLPC over their unfulfilled permit. City Light's acquisition of the right to develop the Skagit River proved to be a major turning point for the agency and set its direction for the next 30 years. (Johnson 2010:8-39–8-40).

3.3.2 Transportation Developments in Skagit River Area of Whatcom County

Prior to development of the SRHP, the upper Skagit River was an area in Whatcom County where Indigenous groups had lived for millennia. What eventually became the town of Newhalem was part of an extended Upper Skagit village system called *k'wabacábš*. Oral history and archaeological evidence indicate that the area was vital for hunting, gathering, and fishing (Mierendorf 1996). Descendants of those Indigenous groups still live and work in the upper Skagit River watershed. While their long history is crucial in understanding the cultural history of the region, this report focuses on the post-contact development that led directly to the establishment of the SRHP and the NCHP. Pre-contact history of the region will be discussed in future Section 106 studies for this project.

The earliest Euro-American exploration of the North Cascades occurred in the 19th century. These explorations were primarily undertaken by parties of the U.S. Army and explored Lake Chelan and the Skagit, Stehekin, Cascade Rivers and their tributary creeks (Luxenberg 1986:10-62). Euro-American miners began traveling east up the Skagit River in the 1880s in search of gold, constructing rudimentary cabins at their claim sites. By the 1890s, a few homesteaders had settled along upper Skagit River in the vicinity of the future site of Newhalem to provision miners with supplies (Johnson 2010:8-2–8-3). These early Euro-Americans developed a narrow trail along the river's north bank with crude bridges spanning creeks, known as the Goat Trail, from Marblemount to the Ruby Creek area (Johnson 20210:8-2–8-3; Luxenberg 1986:198-199). This route was surveyed in 1895 by the Washington Board of State Road Commissioners as part of a broader study of routes through the North Cascades that would link settlements in eastern and western Washington (Johnson 2010:8-2–8-3). By the early 1900s, the Goat Trail's alignment had been more substantially developed, with a road constructed from Marblemount to Bacon Creek and a skid road built between Thornton and Goodell Creeks to the west of the future site of Newhalem (Luxenberg 1986:240). This road was extended to Thunder Creek in the 1920s (Luxenberg 1986:267). By 1939, this road had been improved to allow large vehicle access as far upriver as the town of Diablo and was known as the Skagit Truck Trail (USFS 1950:110, 159).

City Light constructed a railroad in 1920 from Rockport 23 miles upriver to City Camp (later Newhalem) to facilitate the transport of construction materials for the NCPDC and GPDC. Though City Light had initially intended to sell the rail line after the completion of the GPDC, the agency continued to operate the railroad until it was removed in 1954. The railroad was used to transport additional construction materials for the SRHP facilities upriver, such as when it was extended to the Reflector Bar area in 1926–1928 during construction of the DPDC, and to bring visitors to Newhalem for City Light's promotional tours of the NCPDC powerhouse and SRHP facilities in the 1920s and 1930s. (Johnson 2010:8-7:8-22–8-23)

The route of the North Cascades Highway (State Route 20) was first surveyed in 1932 by highway engineer Ike Munson. Munson surveyed a route from Twisp, Washington northwest through the towns of Winthrop and Mazama along the Methow River, across Washington and Rainy passes, then down Granite and Ruby Creeks to the Skagit River above Diablo, and west downriver to Marblemount. Despite Munson's survey, it was not until the early 1950s that this proposed northern cross-mountain highway route gained traction with the Washington State legislature. In 1953, local proponents formed the North Cross-State Highway Association (NCSHA) (later renamed the North Cascades Highway Association in 1971) and began campaigning the legislature to fund the project,

including sponsoring horseback trips for press, legislators, and even Governor Dan Evans along the proposed route. The NCSHA's campaign was successful, and construction of the then-called North Cross-State Highway began in 1959 with a 5.3-mile project from Diablo Dam to Thunder Arm. Progress on the project was slow because of the intensive surveying and construction work required to reshape the rugged landscape of the proposed highway's route, recurring rockslides and avalanches, and total work stoppages at high elevations during winter months. By 1968, a rough dirt road had been constructed along the entire length of the route between Marblemount and Twisp. Paving and other safety and traffic improvements continued over the next 4 years, with the North Cascades Highway officially opening on September 2, 1972. (Dougherty 2015)

Access to the south side of the Skagit River in the vicinity of the existing Skagit River Bridge was first provided by a log bridge, which was built sometime between 1919 and 1953 based on available map data (City Light 1919e; Neely 2020:6). This log bridge was replaced in 1958 by the current USFS-constructed Skagit River Bridge (Neely 2020:6). It is likely that the log bridge's construction was related to early timbering of USFS land in this area. Rudimentary logging roads in this area were first documented in 1953, including the unimproved road now colloquially referred to as the Dam Access Road (USGS 1953). The Dam Access Road is not associated with the NCHP's 1919–1921 development, though it was used by City Light during the redevelopment of the headworks in 1967–1969. In 1953, the road's alignment began on the north side of the Skagit River and proceeded across the river and southwest through the areas west of Newhalem Creek with short branches off the road's east and south sides, before turning back east to the creek and continuing along its western bank south past the site of the headworks into the wilderness beyond (USGS 1953). The road colloquially referred to as Powerhouse Road is estimated to have been constructed between 1958 and 1969. The road is not present in the 1958 USGS topographical map of the area and was first depicted in a 1969 City Light topographical map of the redeveloped NCHP with a meandering alignment proceeding east from the Dam Access Road to the NCPDC powerhouse (USGS 1958; City Light 1969c). The Powerhouse Road is not associated with the NCHP's 1919–1921 development, though it was used by City Light during the reconstruction of the powerhouse in 1967–1969, which involved City Light's construction of the Newhalem Creek Bridge.

3.3.3 Skagit River Hydroelectric Project

City Light's original intent for the SRHP was the development of a single dam at Ruby Creek, with a powerhouse 10 miles downriver. However, preliminary studies indicated that building a dam of the proposed scale that far up the remote river was logistically infeasible. In response, City Light developed a phased approach in which it would build a series of escalating dams upriver, beginning first with a dam and powerhouse built below Gorge Creek (now the GPDC), followed by the originally proposed reservoir storage dam at Ruby Creek (later renamed Ross Dam after J.D. Ross's death in 1939 and now part of the RPDC), and then a third dam and powerhouse in the Diablo Canyon (now the DPDC). As part of the phased construction approach on the Skagit River, the need for power for the construction camp in Newhalem and to facilitate the construction of the GPDC, became apparent early on. This resulted in the selection of a site for the construction of a small dam and hydroelectric plant to serve those needs. Located east of Newhalem Creek on the south side of the Skagit River, the NCPDC was built starting in 1918 and was completed in 1921 and licensed as the NCHP (discussed below in Section 3.3.4, *Newhalem Creek Hydroelectric Project*). Construction of the GPDC began in 1921 and was completed in 1924. The timber crib dam built in 1923 as part of the GPDC was raised 2 feet in 1929 and replaced in 1950 with a concrete diversion dam. An extension to the powerhouse on the north side was built in 1948 and 1949 and included the

construction of an additional power tunnel. A new transmission line from the powerhouse to Seattle was also built at the same time. (Johnson 2010:7-28–7-34; 8-5–8-7; 8-44–8-46)

After the GCPD was completed in 1924, transportation of construction materials and equipment upriver to the RPDC site still proved infeasible. In response, City Light moved forward with the construction of an intermediate facility, the DPDC. Construction of the DPDC, including the extension of the Skagit River Railroad from Newhalem to the project site, the powerhouse, incline lift, and dam began in 1927 and was completed in 1936. Work on the Ross Dam started the following year and was completed in two stages, with construction halted by World War II. The first stage of the dam was built between 1937 and 1940. Construction of the second stage of the dam resumed in 1943 and was completed in 1949. The third stage of the dam and the powerhouse were from 1948–1952, with one of the three Westinghouse generators in operation at the end of 1952. Three additional generators were installed in 1953, 1954, and 1956, respectively. City Light's last major SRHP project was the construction of the Gorge High Dam. Built between 1957 and 1961, the new dam increased the capacity of the Gorge Lake and, thus, the generation potential of the GPDC—the original GPDC timber dam was not demolished and remains submerged in the reservoir. At the time of its completion, the SRHP was an unrivaled achievement of both power generation and engineering for a municipal utility. (Johnson 2010:7-34–7-42; 7-50–7-54; 8-21–8-23; 8-34; 8-44–8-49).

During the planning and early construction of Ross Dam, City Light considered eventually raising the dam beyond what was ultimately constructed. The project was approved in 1942 by the International Joint Commission, an organization established by the Boundary Waters Treaty of 1909 between the United States and Canada, and the City of Seattle and British Columbia provincial government signed an agreement stipulating that Seattle would compensate the province for damages resulting from potential flooding of the Skagit River north of the border. However, British Columbia tried to back out of the agreement in the early 1950s, stalling the project until a second agreement was reached in 1967. The establishment of the North Cascades National Park in 1968 somewhat complicated the City's plans, though provisions in the park's legislation precluded NPS direct interference with City Light's existing proposal. However, the presence of the new national park raised the salience of the project among U.S. environmentalists, who joined with Canadian activists in fierce opposition to the project's construction. (Louter 1999d). Despite the International Joint Commission's determination that the 1967 agreement between Seattle and British Columbia provided City Light with the legal right to flood Canada, the provincial government fought against the project proceeding throughout the 1970s, asserting that Seattle could not adequately compensate the province for the project's environmental impacts. After Federal Power Commission's (FPC) (now FERC) decision to approve City Light's amended license to raise Ross Dam in 1977, a coalition of American and Canadian environmental groups, the U.S. Department of Interior, and affected Indian Tribes, including the Upper Skagit Tribe, Swinomish Tribal Community, and Sauk-Suiattle Tribe, requested a rehearing. Though the FPC held an additional hearing in 1978, the agency again approved City Light's amended license for the project. The 1978 license approval was then appealed to the Washington, D.C. Circuit Court of Appeals in 1980, which upheld FPC's decision (Louter 1999d). Although City Light had legal standing to proceed with the project, the agency ultimately relented in the face of the popular opposition coalition advocating energy conservation and environmental protection (Louter 1999d). Seattle and British Columbia signed the High Ross Treaty in 1984, in which City Light agreed to not raise Ross Dam for 80 years in exchange for Canadian power purchased at rates equivalent to those had the project been completed; it also created the Skagit Environmental Endowment Commission, which manages the fund created to

preserve the area and protect fish and wildlife habitats in the Skagit Watershed until 2065 (SEEC 2023).

3.3.4 Newhalem Creek Hydroelectric Project

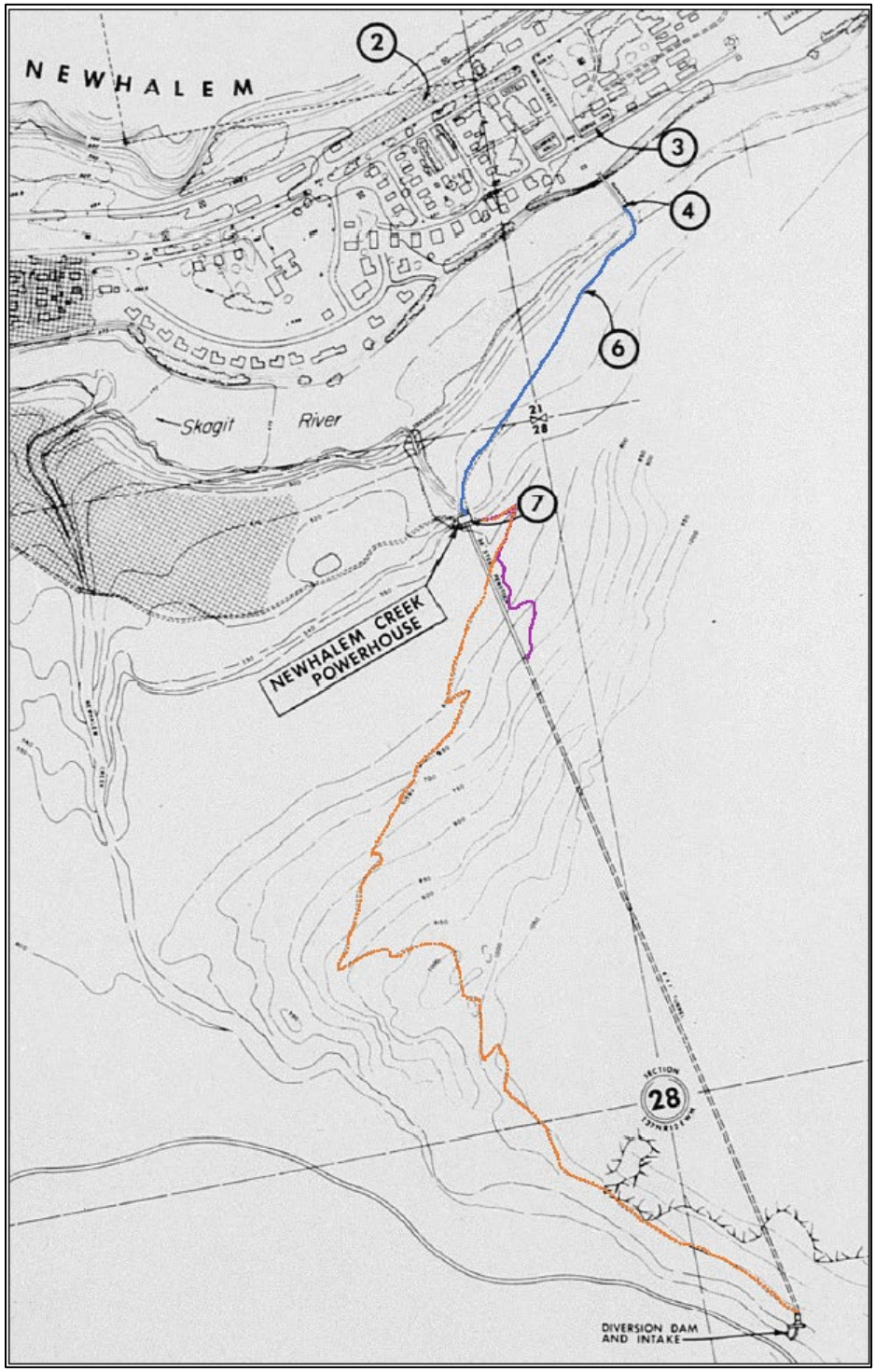
In planning for the SRHP, City Light determined it needed a small temporary hydroelectric facility sited near the work camp and construction site. City Light selected Newhalem Creek, a tributary off the south side of the Skagit River near present-day Newhalem. The construction of the NCHP was a prerequisite for the construction of the GPDC, as the temporary hydroelectric facility would provide power to the construction camp that would serve as headquarters of the SRHP and would later become the town of Newhalem (Johnson 2010: 8-5). The NCHP site was surveyed in the summer of 1918 and construction of the NCPDC began in 1919 (Johnson 2010:8-5).

To provide access for laborers to NCPDC construction sites on the south side of the Skagit River, City Light constructed a wood suspension bridge near the Gorge Inn in Newhalem and a skid road—a road consisting of logs placed perpendicular to the road's alignment—from the south side of the bridge to the trail accessing the powerhouse site (City Light 1920b, 1920e). Following construction of the NCPDC, the bridge and this portion of the skid road was repurposed as a pedestrian trail from Newhalem to the powerhouse, which was an early iteration of the current Trail of the Cedars. The alignment of the Trail of the Cedars (Recreational Facility #6) was depicted in the NCHP's 1969 FERC license application (**Figure 4**) and matches that of the 1920 skid road (City Light 1920e; City of Seattle 1969:Exhibit R).

Construction materials were transported from City Camp (present-day Town of Newhalem) to the powerhouse site using construction methods common to logging during the early 20th century. City Light constructed a cableway skidding system (also referred to as an overhead system) from the railway on the north bank of the river to the powerhouse site, which was used to move materials across the river just to the west of the suspension bridge (City Light 1919f, 1920a; Bryant 1923:504). This overhead system consisted of a set of two poles connected by a cross bar (referred to as a head spar tree) on each bank of the river, with the northern head spar tree additionally supported by a central strut (City Light 1920a; Bryant 1923:504). A cable ran between each head spar tree, with winches on either side to facilitate the movement of the traveler (the device that held materials) along the cable (City Light 1920a). This system remained in place just north of the suspension bridge through at least 1937 but was removed by the early 1950s (**Figure 5**) (City Light 1937). After materials crossed the river, they were transported west to the powerhouse along the skid road. A skidder—a device powered by steam or electricity that operates on or near a railroad track, which moves materials by means of a cable—was installed on the hill to the east and behind the powerhouse to transport construction materials uphill from the powerhouse site to build the penstock (**Figure 6**) (City Light 1920f; Bryant 1923:504).

The headworks site was accessed by a pedestrian trail, known as the Gatehouse Trail, which ascended the adjacent hillside on southwestern alignment from the powerhouse toward Newhalem Creek, and then proceeded west and south above and to the east of Newhalem creek (City Light 1920e). The alignment of the Gatehouse Trail was depicted in City Light's April 1920 Drawing No. B-55 and again in the NCHP's 1969 FERC license application, though the trail was not explicitly identified in the latter (**Figure 4**) (City Light 1920g). Construction materials for the 1921 headworks' timber crib dam and intake/gatehouse structure were sourced directly from the headworks site and surrounding area (City of Seattle 1969:Exhibit Q-1).

Figure 4. Excerpt of 1969 NCHP FERC License Application Exhibit R showing the alignment of the Gatehouse Trail (marked in orange), Trail of the Cedars/Old Skid Road (marked in blue), and the approximate alignment of the Tunnel Portal Trail (marked in purple).



Source: City of Seattle 1969:Exhibit R.

Figure 5. Skagit River cableway skidding system and traveler in 1937 with 1920 Newhalem Suspension Bridge in background, facing northeast

Source: City Light 1937.

Figure 6. 1921 NCPDC powerhouse during construction in 1920 with skid road and penstock in background, facing south

Source: City Light 1920f.

The NCPDC was completed in 1921, with power first produced in August of that year (Johnson 2010:7-44, 8-5). The 1921 NCPDC consisted of the headworks on Newhalem Creek approximately 1 mile upstream from its confluence with the Skagit River, power tunnel, penstock, powerhouse, tailrace, and transmission line. The headworks originally consisted of a low log crib diversion dam that directed water into a vertical intake connected to the power tunnel by a 55-foot-tall, 5-foot-by-5-foot vertical rock shaft (Johnson 2010:8-5; City Light 2022a:1-1). The intake structure was located east of the dam; it was constructed of cedar logs and timbers with angled trash rack and included a vertical air vent that extended through a platform constructed above the intake (City Light 1921a, 1921b). While a gatehouse design was not included specifically in the 1921 construction drawings for the intake, a "timber shelter" was noted above the platform over the intake. The earliest photos of the timber shelter from 1943 and 1949 show a gable-roofed post-and-beam-framed structure clad in vertical board with half-logs in its gabled peak (**Figure 7** and **Figure 8**). It was also likely built in 1921 along with the intake (City Light 1921a, 1921b, 1943, 1949).

From the intake, water flowed underground through the power tunnel, a bored tunnel measuring approximately 2,452 feet long and 6 feet wide by 7 feet tall, extending north–northwest through the bedrock of the adjacent hill (Johnson 2010:8-5; City Light 2022c:1-1). The tunnel was bored using air-driven jackhammers and Leyner drills, which used water and air to clear out the rock debris (Roberts 1924:952; MacRae 2012). Drilling teams worked in three shifts, with 119 feet being the best weekly advance recorded (Roberts 1924:952). The power tunnel funneled water into the penstock via a pipe intake bell surrounded by a concrete plug, which sealed the penstock to the power tunnel and forced water into the penstock (City Light 1919b). The penstock's upstream end also had a metal grate to prevent debris from flowing into and ultimately down into the powerhouse turbine (City Light 1921c). The penstock consisted of a 925-foot-long pipeline, of which 218 feet were located within the power tunnel and the remaining 707 feet extended downhill to the powerhouse after daylighting from the power tunnel (Johnson 2010:8-5; City Light 2022c:1-1). Along its descending alignment, the penstock was supported by U-shaped timber saddles, placed at regular short intervals between six thrust blocks (City light 1919c). The six rectangular-poured concrete thrust blocks were constructed around the single penstock as it descended from the power tunnel toward the powerhouse (City Light 1919c). The penstock diameter gradually decreased over its alignment from 33 inches to 30 inches, while its thickness increased from 5/16-inch flange steel at the top to 3/8-inch flange steel at the base of the hill (City Light 2022c:1-1; Allen 1921: 401). Notably, the Coast Culvert & Flume Company (CCFC) used electric arc welding to construct the penstock, a technique that reduced the cost of extensive field riveting in such a remote location and that was claimed by a company engineer to be the "first installation of welded pipe for such purposes in the Northwest" (Allen 1921:401).

The penstock split as it entered the powerhouse to service each of the plant's two PWWC double-nozzle impulse-type waterwheels, which powered a 2,000-kVA Westinghouse generator (**Figure 9**) (City Light 1920c; Johnson 2010:8-5; Engineering World 1920:314). Water was discharged from the powerhouse into the tailrace and flowed north to the Skagit River (Roberts 1924:952; Johnson 2010:8-5–8-6). The original 1921 NCPDC powerhouse was a rustic wood-framed building with board-and-batten siding, a corrugated metal roof, and a series of wood-sashed windows along its north façade (**Figure 10**) (City Light 1919a). A 6,600-volt aboveground transmission line transmitted power from the powerhouse, which ran northwest over the Skagit River to the rail line in Newhalem, and then northeast to the GPDC construction site (City Light 1921d).

Figure 7. 1921 NCPDC headworks in 1943 with dam in foreground and timber intake and gatehouse in background, facing southeast

Source: City Light 1943.

Figure 8. 1921 NCPDC headworks in 1949 with dam and log bridge at left and timber intake and gatehouse at right, facing east

Source: City Light 1949.

Figure 9. 1921 NCPDC powerhouse interior in 1921 showing PWWC double-nozzle impulse-type waterwheels and Westinghouse generator, facing northeast

Source: City Light 1921e.

Figure 10. 1921 NCPDC powerhouse in 1959, facing south

Source: City Light 1959.

The NCHP provided power to the buildings of the City Camp, as well as for the construction of both the GPDC power tunnel and Gorge Powerhouse. These competing demands on the facility's limited capacity led to power shortages and delays in the construction of the GPDC (Johnson 2010:8-6). City Light initially intended the NCHP to be a temporary facility to facilitate the construction of the City Camp and the GPDC (Johnson 2010:8-5). However, the facility remained in operation following the completion of the GPDC in 1924, with its output then routed into the larger Skagit transmission and distribution network. In this new role as a local production and support facility, the NCHP provided power for the town of Newhalem and station service power for the Gorge Powerhouse's electrically operated equipment (e.g., heating, lighting, and cooling). The powerhouse was semi-automated in the early 1950s, allowing it to operate largely unmanned, with manual start-up and shut-down still required (Johnson 2010:8-5–8-7). City Light redeveloped the transmission line from the powerhouse to the Gorge Powerhouse in 1965, undergrounding most of the line within the town of Newhalem and rerouting it along the north bank of the Skagit River (City Light 1965a, 1965c). The line remained overhead across the Skagit River from the Newhalem Creek powerhouse and was placed in a conduit along the Skagit/Newhalem/Gorge – Suspension Bridge (WISAARD Property ID 103436) to connect with the Gorge Powerhouse (City Light 1965b). This project followed two decades of expansion and redevelopment of Newhalem and was likely a needed improvement to the town's local electrical distribution network (Johnson 2010:8-16–8-19).

A fire in July 1966 severely damaged the powerhouse (**Figure 11**). It burned down the wood building, but a flange gasket in one line of the bifurcated penstock behind the powerhouse blew out, creating a 60- to 70-foot-high sheet of water behind the powerhouse preventing fire damage in the surrounding wooded area. Additionally, the equipment within the powerhouse continued to run, saving the original PWWC turbines and Westinghouse generator from warping from the heat of the fire (Johnson 2010:8-5). After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. To access the powerhouse from the west, City Light replaced a log stringer bridge over Newhalem Creek on Powerhouse Road—which had been washed out by high water—with the current Newhalem Creek Bridge (City of Seattle 1969:Exhibit N). Built in 1968, Newhalem Creek Bridge is an 80-foot, single-span, steel-beam bridge with concrete abutments, a metal grate deck, and horizontal thrie-beam standard highway guardrails (City Light 1968a).

The current powerhouse was constructed between 1967 and 1969 (**Figure 12**) (Johnson 2010:7-44). The only major repair on the generating equipment was the rewinding of the Westinghouse generator and minor welding repair to the two PWWC turbines (Johnson 2010:8-5). In response to requests by NPS, City Light engineer William L. Freitas designed the 1969 powerhouse to resemble that of the 1921 powerhouse to preserve some its historical value and be compatible with its forest setting in the RLNRA (City of Seattle 1969:28; City Light 1971c:11). Elements of the 1921 design carried over to the new building included its simple, single-story, side-gabled form and rectangular plan, its natural cedar board-and-batten siding, and fixed-wood windows (City Light 1969e; City Light 1971c:11). Though not evocative of the 1921 design, the powerhouse's hand-split cedar-shake roof and exposed rafter ends were influenced by the "rustic" architectural aesthetic of the USFS and NPS. Freitas' design was awarded an architecture and engineering honor award by the American Public Power Association (APPA) in 1975 (Seattle Times 1975). Landscaping of the area around the powerhouse was added circa 1973, with a curved retaining wall of large rocks placed along the hillside behind the powerhouse, and light posts strategically placed around the powerhouse; included in this plan was a fire suppression system, consisting of sprinklers mounted on the surrounding light poles (City Light 1973).

Figure 11. NCPDC Powerhouse Site after 1966 fire, facing south

Source: City Light 1966.

Figure 12. 1969 NCPDC powerhouse in 1971 with tailrace in foreground, facing south

Source: City Light 1971a.

The existing headworks on Newhalem Creek was also rebuilt during this period. City Light used the Dam Access Road to transport construction materials and heavy machinery for site excavation to the headworks site and built cofferdams to alter the flow of Newhalem Creek during construction (City Light 1969i). The 1921 log crib diversion dam had been washed out and was removed. The intake structure and timber shelter were also removed and rebuilt as part of the new headworks (City of Seattle 1969:Exhibit S). The 1969 headworks consisted of a curved concrete diversion dam and apron, rectangular sluice way/channel, intake and rock shaft, gatehouse, and associated concrete slabs around the gatehouse (**Figure 13**) (City Light 1969a, 1969b). The new headworks retained the existing log footbridge that crossed from the western bank access road to the gatehouse on the eastern bank, which was replaced with the current steel bridge in 2011 (City Light 1971b, 2011). The gatehouse mimicked the design elements of the 1969 powerhouse in its side-gabled form, its natural cedar board-and-batten siding, hand-split cedar-shake roof, and exposed rafter ends (City Light 1969d, 1971).

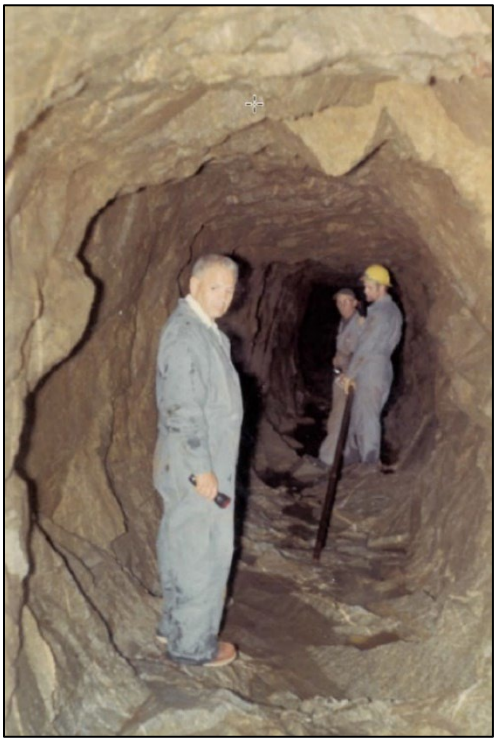
The redeveloped NCPDC retained and continued to use the original power tunnel (**Figure 14**), penstock (**Figure 15**), and tailrace, the latter two of which required only minor maintenance and repairs following the fire. Before going back online in 1970, the NCPDC powerhouse was fully automated, the first of the Skagit River facilities to undergo the process, and remote control of the newly operational powerhouse equipment was established at the Gorge Powerhouse (Johnson 2010:7-44; 8-5; 8-46; City Light 1971c: 11).

The NCHP was relicensed in 1997 and continued to operate until 2010 (City Light 1992, 2022c:A-5). The NCHP has not been consistently in service since 2010 due to an automatic gate valve requiring repairs. While equipment and structural issues resulting in the 2010 shutdown were eventually addressed, subsequent issues necessitated the current decommissioning of the NCHP. In 2015, a wildfire burned many of the original wooden penstock saddles, requiring an extensive replacement project in 2016-2017. More recently, leaks in the power tunnel, maintenance needs at the headworks and powerhouse, and access road safety concerns prohibit the continued operation of the NCHP. In 2021, City Light began the process of surrendering the facility's license (City Light 2022c:vi,).

Figure 13. 1969 NCPDC headworks in 1971, facing east

Source: City Light 1971b.

Figure 14. NCPDC power tunnel in 1968, direction unknown



Source: City Light 1968a.

Figure 15. NCPDC penstock in 1968, facing southeast

Source: City Light 1968b.

3.3.5 Tourism and Recreation (1924–2001)

Shortly after the completion of the GPDC, City Light began to use the SRHP as a showcase for municipally developed hydroelectric power. The first publicized tours were held in 1924, consisting of 1-day trips to Newhalem and a tour of the GPDC facilities. The skid road that had been constructed from the 1920 Newhalem suspension bridge to the powerhouse was redeveloped as a pedestrian trail and used as part of City Light's SRHP tours in the 1920s and 1930s. After an "ample meal served in the huge community hall" the first evening of the two-day tour, guides led visitors over the suspension bridge and through a "pleasant" woodland trail to the Newhalem Creek Powerhouse, which stood as a point of interest among the majestic cedars (Federal Writers Project 1941: 513). This trail was an early iteration of the current Trail of the Cedars, a component of the trail network. By 1938, the tours had evolved to longer 2-day events, with rail transportation up the Skagit canyon from Rockport and a boat tour up Diablo Lake, serving thousands of visitors every summer. J.D. Ross spearheaded these promotional efforts, frequently inviting notable politicians, engineers, and journalists and leading the day tours and giving evening lectures himself. Through Ross's tireless promotion, City Light and the SRHP gained national attention and influenced further development of large-scale public hydroelectric projects. (Johnson 2010:8-50, 8-58–8-59).

In addition to its promotional tours, Ross envisioned additional tourist and recreational developments alongside the SRHP. In 1925, Ross began promoting the town of Newhalem as a future summer resort and improved the original construction camp to facilitate the growing popularity of its tours of the GPDC and DPDC construction sites. By 1928, Ross had developed a full-scale plan for the development of Newhalem's tourist facilities to support multiple-day excursions. Though never fully implemented, the plan included the complete redevelopment of the town's layout, including its street system, new buildings, and lawns and gardens. Individual projects proceeded over the next decade, including tourist dormitories, landscaping, and ornamental lighting along the town's main thoroughfares. A greenhouse and two large nurseries were built to grow native trees, shrubs, and

flowers on site, though Ross sourced plantings from elsewhere as well. These developments drove a continuous increase in popularity and scale of City Light's promotional tours, with accommodations increasing from 150 overnight tourists in 1930 to 500 by 1935. City Light pursued other recreational and tourist developments in the vicinity of the town of Diablo after the completion of the DPDC. Ross had planned for the DPDC construction camp to become a resort and tourist center, complete with a zoo. However, this plan was only briefly implemented in the 1930s, and following Ross's death in 1938 and the onset of World War II, it was discontinued in favor of the town remaining a construction camp and employee town during the construction of the RPDC. (Johnson 2010:8-11–8-15, 8-27).

The development of Ladder Creek Falls Gardens exemplifies Ross's holistic vision for a joint-promotional, tourist, and recreational development. Covering approximately 2 acres along Ladder Creek east of the Gorge Powerhouse, the gardens consisted of a series of paths that climb the hill behind the powerhouse to a concrete staircase built to a viewpoint of Ladder Creek Falls, as well as small-scale features, such as granite steps, rest areas with benches of rustic logs, and wood bridges over small streams, some of which have been diverted to form small waterfalls into granite-lined and concrete pools. While the gardens featured predominantly native plants, Ross introduced some exotic species. The gardens were a key component of Ross's promotional tours, with the area's natural beauty supplemented by sound and lighting systems installed throughout that played pleasing organ recordings and illuminated the paths and Ladder Creek Falls at night. Though maintenance of the gardens declined after 1941 when tours were put on hold, City Light pursued a maintenance project in 1962 to repair the gardens' lighting system for resumed tours (Johnson 2010:8-19–8-21).

By 1941, City Light tours had increased in capacity to parties of 600 with three tours a week. Tours were suspended at the start of World War II and remained on hold until 1953 due to financial and personnel constraints resulting from the ongoing construction of the RPDC. City Light Superintendent Paul Raver renewed promotional tours of the SRHP in 1953 and offered tours the following year, though they were limited due to other ongoing construction activities on the Skagit River Railroad and at Gorge High Dam and Ross Powerhouse. Tours were again postponed in 1955, but day trips resumed in full in 1956. The capacity of tours gradually increased over the next decade, particularly after City Light's acquisition of the of the 102-passenger excursion boat, the *Alice Ross II*, with attendance dramatically increasing from 3,500 to over 20,000 annually by 1965 (City of Seattle 1969:Exhibit R).

After the establishment of the North Cascade National Park and RLNRA in 1968, recreation facilities included Ladder Creek Falls and Gardens, visitor parking for Skagit Tours, Gorge Inn, a suspension bridge across the Skagit River, a foot trail (the Trail of the Cedars) from the suspension bridge "through virgin forest to Newhalem Creek Powerhouse," and viewing areas around the powerhouse (City of Seattle 1969: Exhibit R, Recreation Facilities). In 1969, City Light collaborated with Grant Sharpe, Professor of Outdoor Recreation at the University of Washington's College of Forest Resources to redevelop the Trail of the Cedars into a loop trail, which used the previously converted alignment of the 1920 skid road trail as one segment of the loop (City Light 1992:7-2). This project was part of City Light's efforts to reincorporate the powerhouse into its promotional tours in the early 1970s, which also included the c. 1975 construction of the current Skagit/Newhalem – Trail of the Cedars Suspension Bridge (WISAARD ID 103521) (City Light 1969f, 1969g; Johnson 2009; City Light 1971c:11). The original wood support towers of Skagit/Newhalem – Trail of the Cedars Suspension Bridge were replaced in 2001 with the current steel towers, though the bridge's original

deck and rails were retained (City Light 2002). Though not identified as a recreational facility, the 1969 NCHP FERC license application also depicted the alignment of the Gatehouse Trail, the original pedestrian access trail from the powerhouse to the headworks on the east side of Newhalem Creek. Exhibit R additionally identified Dam Access Road and Powerhouse Road as motor nature trails that NPS proposed for future recreational development.

The Linking Trail connecting the powerhouse to the Newhalem Creek Campground was built by City Light in partnership with NPS as part of City Light's 1997 Recreation Plan developed in support of the NCHP's 1997 FERC license (City Light 1992; 2022c:E-40). A brief segment of Gatehouse Trail is now part of the Tunnel Portal Trail, a component of the trail network near the powerhouse that provides emergency evacuation in case of inundation due to a dam breach. By 1992, the Gatehouse Trail's lack of maintenance and limited use had led to the trail being overgrown and difficult to follow west of the penstock (City Light 1992; 2022c:E-40). Its current condition is unknown.

3.3.6 City Light's Public versus Private Power Struggles (1920s–1930s)

City Light played an important role in counteracting the consolidation of private electrical companies in the 1920s and 1930s as one of the premier municipal utilities in the country during this period. Joined by Oliver Erickson, a Seattle politician, and state representative Homer Bone, Ross organized the Washington State chapter of the Super Power League, an organization dedicated to public ownership of electrical utilities formed by Nebraska Senator George Norris and Samuel Gompers, president of the American Federation of Labor (Johnson 2010:8-41–8-42). Ross and Bone sought to check the reach of private utilities by establishing links between the City Light and Tacoma Power systems, as well as other smaller municipal plants, and allowing public utilities to sell power outside their jurisdictions. The latter goal took the form of a statewide ballot measure, known as the Bone bill, which was defeated in 1924 (Johnson 2010:8-42). The measure was heavily campaigned against by private companies and opposed by organizations, such as the Chamber of Commerce and Municipal League, which had initially supported municipal ownership but shifted to favor private utilities. While Seattle and Tacoma interconnected their systems in 1923 with a tie line, their efforts to bring in smaller municipalities were preempted by their purchase by private companies following the defeat of the Bone bill (Johnson 2010:8-42). As part of FTC investigations into the county's private electrical companies in the late 1920s, it was revealed the PSLPC had financed the Voter's Information League of Seattle and directed them to discredit the lighting department. In response, Ross helped establish two advocacy organizations for municipal utilities, the Friends of City Light and the Citizen's Municipal Utilities Protective League (Johnson 2010:8-42). The passage of PUCHA in 1935 and the organization of the NPP led to detente between private and public utilities in the Pacific Northwest. City Light was a founding member of the NPP when it was formed in 1942 and became an integral partner in its expansion and integration the region's hydroelectric power supply (Kershner 2016a).

In 1931, Ross, and by extension City Light, became embroiled in the election and subsequent recall of Seattle Mayor Frank Edwards. Prior to the election, Ross had successfully persuaded the city council to include the establishment of City Light's own engineering department as ballot measure, which was opposed by Edwards as a costly and redundant city expense. Edwards planned to fire Ross following the election, asserting in letter written the day before that he was inefficient as City Light's superintendent. However, the letter was leaked to Ross and then to the *Seattle Star*, a newspaper that favored Ross's leadership of City Light. The next day voters reacted against

Edwards, passing the City Light engineering department measure and electing supporters of Ross to the city council. The Citizen's Municipal Utilities Protective League immediately began organizing a recall election of Edwards on the grounds he fired Ross under false pretenses. The recall effort was successful, and Ross was reinstated by interim mayor Robert Harlin in the summer of 1931. Additional supporters of City Light were elected in Seattle during the 1930s, stabilizing the political environment in which the agency operated (Johnson 2010:8-43).

3.3.7 City Light's Expansion and Conservation Efforts (1945–1996)

Following World War II, City Light continued to consolidate its territory at home and pursue expansions of its power supply elsewhere. Ross's successor as City Light Superintendent, Eugene R. Hoffman (City Light Superintendent 1939–1953), proposed the total buyout of PSPLC in 1941 (Wilma 2001a). The city council approved Hoffman's proposal in 1943, with the buyout set for 1953 when the company's franchise expired (Wilma 2001a). However, the $26.6 buyout was completed 2 years earlier than expected in 1951, supported in part by regulations breaking up PSLPC assets and acquisitions by City Light ahead of the scheduled 1953 buyout (Wilma 2001a). PSLPC discontinued its operation of interurban railway in 1939, converting its transit operations to buses. However, after it was forced by federal antitrust regulators to sell its North Coast bus line in 1947, City Light took over the company's transit service (Crowley 1999). Three years later, Seattle voters approved an ordinance to purchase the remaining private power assets and services within the city limits, making it the exclusive electric power provider within the city and pushing PSLPC out to the surrounding metro area (Crowley 2000). After this acquisition, the Seattle City Council began pressuring City Light to underground its transmission infrastructure within the city limits, an effort opposed by then Superintendent Paul Raver (City Light Superintendent 1954–1963) as prohibitively costly and likely to introduce new maintenance issues (Wilma 2001a). However, in preparation for hosting 1962 Century 21 World's Fair, the council instructed in 1959 City Light to prepare a plan for undergrounding within the city, ultimately implemented by Raver's successor John M. Nelson (City Light Superintendent 1963–1971) (Wilma 2001b).

City Light constructed two additional hydroelectric facilities after the completion of the SRHP. The Boundary Hydroelectric Project on the Pend Oreille River near Metaline Falls in Pend Oreille County, constructed from 1963–1967 (MacDonald 2018) and much later, the South Fork Tolt Hydroelectric Project in eastern King County completed in 1996. The Boundary Hydroelectric Project was one of four City Light projects recognized by APPA in 1975, including the NCPDC powerhouse, Union Street substation (1973), and Boundary Dam Vista House (*Seattle Times* 1975). Under Nelson, City Light also pursued alternative energy sources in the 1960s to grow its capacity. City Light purchased 8 percent of a coal-fired power plant in Centralia, Washington and in 1968 bought Kiket Island in partnership with the City of Everett to develop a $250 million, 1,100-megawatt nuclear power plant, though the project never went forward due to environmental and safety concerns (Wilma 2001c).

As a member of the NPP, City Light played a role in the organization's conservation efforts in the 1970s. Due to inflation, low water levels, and a reduction in capacity growth related to the unrealized High Ross Dam and Kiket Island Projects, City Light was forced to raise its rates after several decades of reductions and use the Lake Union steam plant to supplement its capacity (Wilma 2000). The agency introduced its Kill-A-Watt campaign in 1973 to promote electricity conservation, which resulted in a reduction in consumption of 7 percent that year (Wilma 2000). In 1975 City Light published a nine-volume report, *Energy 1990*, that recommended the City Light embrace

conservation and look for additional or alternative sources of electric power, though nuclear energy was notably excluded; the Seattle City Council adopted these policies the following year (Wilma 2000). The South Fork Tolt Hydroelectric Project was City Light's most recent effort to expand its production capacity to complement the conservation-based approach of the agency since the 1970s to balance power supply and consumption (City Light 2022b).

3.4 Federal Agencies within the Project APE

The area in the vicinity of Newhalem and NCHP has been administered by federal agencies since the early 20th century, including USFS and NPS, and to a lesser extent, the United States Geological Survey (USGS).

3.4.1 U.S. Forest Service

The federal administration and management of government-owned forest land began in 1881 under the newly established Department of Agriculture Division of Forestry, which gradually increased in capacity and duties over almost three decades until the federal role was fully delineated in 1905 with the establishment of the USFS. The role of the USFS was influenced by two pieces of legislation, the Forest Reserve Act of 1891 (later referred to as the Creative Act) and Sundry Act of 1897 (later referred to as the Organic Act), which provided the president with the authority to establish forest reserves and outlined the criteria of forest protection, watershed protection, and timber production in forest reserves, respectively. The National Forest Commission of 1896 supplemented these efforts, as the commission provided recommendations for new forest reserves, as well as Mount Rainier and Grand Canyon National Parks (Williams 2005:5, 8, 10, 17).

The remote forests of the North Cascades in modern-day Whatcom County had been administered as part of the nearly 3.6-million-acre Washington Forest Reserve since its establishment in 1897 by President Grover Cleveland under authority granted to him by the Forest Reserve Act (Johnson 2010:8-3). In 1908, the Washington Forest Reserve was divided into two administrative units, the northern Washington National Forest and southern Snoqualmie National Forest; the Washington National Forest was renamed Mount Baker National Forest in 1924 (Johnson 2010:8-3; USFS 2023). Mount Baker National Forest and Snoqualmie National Forest remained separate units until 1973, when the two were merged into the current administrative unit, Mount Baker-Snoqualmie Nation Forest (USFS 2023).

As the USFS had jurisdiction over the Skagit River area, City Light coordinated with the agency for land acquisitions, use of existing USFS buildings, and new construction permits for City Light facilities. This coordination included permitting City Light's first construction in 1919, a saw mill at Goodell Creek on August Dohne's former homestead that produced materials for the construction of the NCPDC and City Camp, the May 27, 1920 permit for the construction of NCPDC and GPDC, the provision of tree species for landscaping in Newhalem and at Ladder Creek Falls in the 1920s, and permitting City Light's construction of later camps and facilities upriver. Because the FPC and its successor agency FERC were not in existence yet, these permits were issued by USFS. Reflector Bar, the location of the DPDC construction camp, and Hollywood, a City Light housing complex associated with the town of Diablo, were particular points of contentions between the agencies in the 1920s and 1930s. USFS had previously constructed a ranger station on Reflector Bar, around which Diablo developed after USFS granted City Light permission to occupy the area in 1927. Over the next

decade various plans for the development of the Diablo area were contested by USFS, including the use and relocation of the original ranger station, Ross's unrealized plan for Diablo as a resort and tourist center with a park and zoological center, and the development of the Hollywood residential area. However, City Light's close relationship with USFS was also a positive collaboration, with the federal agency providing input on site planning and the architectural design of City Light properties. This design collaboration was exemplified in Diablo and Hollywood, where City Light worked closely with USFS architects to plan the layout of streets, and the design of buildings was influenced by the agency's established rustic aesthetic. (Johnson 2010:8-14, 8-24–8-30).

USFS administration of land and timber sales in the vicinity of the NCHP influenced the development of access roads west of Newhalem Creek in the first half of the 20th century. During this period, USFS issued timber leases on federal lands to raise revenue for the agency's administration and management programs, with timber sales gradually increasing during the 1910s and 1920s, collapsing during the Great Depression, and rebounding with the onset of World War II (Williams 2005:54-55). One documented instance of logging in this area includes the North Bend Timber Company obtaining a federal timber lease in 1943 as part of federal efforts to ramp up lumber production for the war effort (Office of the President and USFS 1943).

3.4.2 National Park Service

NPS has its roots in the early 1870s, when the first national park, Yellowstone National Park, was established through the Yellowstone Act of 1872. Over the next 44 years, national parks, monuments, and reservations were administered by several agencies, including the Department of the Interior, War Department, and USFS. NPS was established in 1916 within the Department of Interior through the Organic Act of 1916 to consolidate administration within a single department and further define the management programs for these federal properties. (NPS 2023b).

The establishment of a national park in Washington's North Cascade Range was proposed as early as the 1890s and again in the early 1900s, with Lake Chelan rising to the top of potential areas for park development. Though these proposals received some support from Washington business interests and press, they were defeated by a coalition of local mining interests and the state's congressional representatives. Moreover, opponents argued that the area's inclusion in the Washington Forest Reserve already provided it with a degree of protection and public access under USFS administration. For its part, USFS disfavored establishing national parks within its jurisdiction, particularly after the establishment of NPS, on grounds that it could capably perform similar management activities, such as providing recreation facilities, building roads, and administering mineral leases, railroad rights of way, waterpower and irrigation developments, and timber sales. These jurisdictional jealousies and competing interests characterized the relationship between USFS and NPS over the course of the 20th century, with several particular flashpoints in Washington. (Louter 1999a).

While Mount Rainier was the primary focus of NPS in Washington during the agency's early years, the expansion of the NPS and its mission in the 1930s as part of Great Depression-era relief programs led to a renewed interest by the agency and advocates for a national park in the North Cascades. Park areas in the region were proposed in two agency reports, *Recreation Use of Land in the United States* (1934) and *North Cascades Area Report* (1937). The latter report proposed a new park, the Ice Peaks, spanning the Cascade Range from St. Helens to Mount Baker, encompassing Washington's three other volcanic peaks, Adams, Rainier, and Glacier Peak, and the intervening wilderness. Expectedly, the proposal for a park of that size sparked a substantial controversy, with

fierce opposition from USFS and the state's timber and mining interests and hesitancy from state and local governments over ceding such a large area to the federal government. The Ice Peaks proposal was ultimately defeated in 1940 following a joint NPS and USFS study that led the Washington State Planning Council to recommend that USFS continue to manage federal lands within the range outside of Mount Rainier. (Louter 1999a).

In the years after World War II, the North Cascades was subject to increased developmental pressures from highway expansion and a rising demand for timber for postwar housing. National, state, and local environmental and wilderness recreation organizations, such as the Sierra Club, Federation of Western Outdoor Clubs, North Cascades Conservation Council, Northwest Conservation League, and Seattle Mountaineers feared USFS's multiple use policy within its jurisdictional units, with overlapping timbering, mining, conservation, and recreation programs. This evolving contention between USFS and environmental advocates over the agency's sometimes contradictory land management policies was epitomized in the USFS's plan for Glacier Peak Wilderness. Opponents of the reduced wilderness area viewed its establishment in 1960 as a signal of USFS's prioritization of mining and timber interests over conservation and recreation. Conversely, NPS attempted to strike a middle path in its management practices during this period, with a focus on public access and facility capacity without compromising the protection of natural areas. Disenchanted with USFS management practices in the region and assured by NPS preservation-first approach to park development, advocacy groups refocused their efforts in establishing a national park in the North Cascades. (Louter 1999a).

In 1963, the newly elected Kennedy administration negotiated an agreement between the USFS and NPS that settled long-standing jurisdiction disputes and importantly, established a joint-agency study team to determine whether the North Cascades warranted a national park, ending 4 years of USFS resistance to efforts by NPS and advocacy organizations to study the area for park development. The joint-agency report released in 1966 proposed the creation of a 698,000-acre park extending south from the Canadian Border to Lake Chelan and encompassing Mount Shuksan, Ross and Diablo lakes, the Picket Range, the Eldorado Peaks country, and the Stehekin Valley. The proposed park would provide statutory protection for the range, improve its accessibility, cause minimal adverse impact on resources, such as timber, and bolster the region's tourism economy. In addition to its park recommendation, the report included 21 recommendations for future management of the entirety of the Cascade Range, including the new establishment and enlargement of wilderness areas, the continued multiple-use management of existing forests USFS jurisdictions, and the expansion of Mount Rainier National Park. (Louter 1999a).

Over the next year the proposal slowly gained public and political support, including crucially from Washington Senator Henry M. Jackson and President Lyndon B. Johnson. In March 1967, Jackson introduced legislation (S. 1321), drafted by the Department of the Interior, for the establishment of the North Cascades Park, which was smaller than the 1966 report proposed and divided into northern and southern units with the RLNRA between the units; also included in the bill was the designation of the Pasayten Wilderness and Glacier Peak Wilderness. Amendments to the original bill added additional areas—significantly, the Lake Chelan National Recreation Area—as well as a provision that required the Secretary of Agriculture and Secretary of Interior to develop a plan within 2 years for the coordination of the development of public facilities. The purpose of the plan was to provide a holistic vision for the range despite its administration under multiple agencies and the various types of land management areas that comprised it. (Louter 1999a).

The inclusion of the RLNRA was a key assurance to City Light that the proposed park would not interfere with the utility's hydroelectric facilities on the Skagit River. While the initial RLNRA boundaries encompassed Ross Lake and the portions of the Skagit River area that contained City Light's hydroelectric operations, City Light successfully lobbied for the enlargement of the RLNRA to include additional lands along the Skagit River, including the site of the proposed but unrealized Copper Creek project and the lower Thunder Creek basin (Louter 1999a). Moreover, a provision was included in the legislation that guaranteed that the park's establishing legislation would not supersede or otherwise interfere with the FPC's jurisdiction of City Light's hydroelectric projects in the RLNRA (Louter 1999b). This provision was amended in 1988 to provide greater specificity for FERC's authority over hydroelectric licensed projects in the RLNRA, and explicitly identified the NCHP and SRHP in the RLNRA. The inclusion of this provision and the later amendment demonstrate that the RLNRA boundary was established in part to recognize and accommodate City Light's hydroelectric projects within the boundaries of North Cascade National Park and granted the FPC and later FERC premier authority over their licensing and continued operation (Louter 1999b). Similar provisions were included that allowed for the continuance of federal leases, permits, or licenses issued by federal agencies within the new park's boundaries and that prevented actions that would affect adversely the right-of-way of the North Cross State Highway (now North Cascade Highway), which provided security for mining or resort operations that the new park would not disrupt their existing operations in the area and ensured Washington State's continued construction of the North Cascade Highway (Louter 1999b).

The Senate passed the amended version of S. 1321 in November of 1967. Four bills were considered in the House of Representatives in 1967 and 1968, reflecting the various iterations of park proposals from NPS, environmental and business groups, and Washington State Governor Daniel Evan's study committee. However, in the summer of 1968 Washington State representatives settled around the original House of Representatives version of the original Senate bill, allowing it to move out of the House Interior Committee, and to a successful vote in the House in September 1968. President Johnson signed the North Cascades National Park bill on October 2, 1968, officially establishing the national park. (Louter 1999a).

Given the North Cascade Highway's role as the primary transportation route through the North Cascades National Park, the 1970 master plan focused development of park facilities and amenities within the RLNRA and in the vicinity of City Light properties (Louter 1999b). Campgrounds were proposed and constructed in the 1970s in the vicinity of City Light facilities, including Colonial Creek at the south end of Diablo Lake, Newhalem Creek Campground, to the west of the NCHP, and Goodell Creek Campground west of Newhalem on the north side of the Skagit River (Louter 1999c, 1999f). Newhalem Campground became a focal point of campsite development, with NPS requesting $2.5 million from the House Interior Subcommittee in 1975 to supplement appropriations for construction projects in the 1968 bill, which resulted in the expansion of the campground's capacity to 450 sites in the late 1970s. The North Cascades Visitors Center (NCVC) was built to the southwest of Newhalem Campground in 1993 (Louter 1999c, 1999f). The proposed development of Roland Point as a large-scale waterfront area on the eastern shore of Ross Lake ran counter to City Light's consideration of the High Ross Dam during this period, which in turn would have raised the water level of Ross Lake and inundated most of Roland Point (Louter 1999b). Though this City Light project has not been realized to date, the project's possibility during the park's early development led to NPS to not pursue the Roland Point development (Louter 1999b, 1999d). Finally, lookouts at Gorge, Diablo, and Ross lakes provided automobile tourists with spectacular views of City Light's

facilities, and interpretive signage was installed to detail their effect on the river and surrounding landscape (Louter 1999b).

In the 1980s and 1990s, NPS played a significant role as an intervenor in City Light's various FERC relicensing applications for the SRHP and NCHP, as well on proposals for smaller hydroelectric projects within North Cascades National Park. Supported by an increased awareness among the public on the environmental impact of dams, and particularly those associated with hydroelectric power, NPS influenced the environmental reviews for these projects and secured mitigation packages that benefited the agency's conservation, preservation, and recreational programs within the North Cascades National Park and RLNRA. The relicensing settlement for the SRHP in 1991 exemplified these efforts, in which City Light agreed to buy Diablo Lake Resort and construct an environmental learning center, develop recreation amenities at Ross Lake, purchase land for wildlife protection, finance a revegetation program and fish conservation study, and document and protect archaeological and historic resources within the RLNRA. (Louter 1999e).

3.4.3 United States Geological Survey

Established in 1879, USGS was responsible for the survey and classification of public lands and the study of their natural resources (USGS 1975). USGS had a minimal relationship with City Light in the Skagit River area compared to USFS and NPS. Prior to the arrival of City Light, the agency had built and maintained stream-gaging stations to measure water depths along the river in the [ea]rly 20th century, including in Newhalem and at Reflector Bar, and on Stetattle Creek. While Reflector Bar and Stetattle Creek stations were abandoned by 1916, the Newhalem station, established in 1909, remained and City Light took over its operation in 1918. In 1923, a new concrete structure was constructed for the station that remains extant in Newhalem, though a cable car associated with the station built by USGS in 1909 was removed after 1991 (Johnson 2010:8-3). An additional USGS gauging station was installed at the NCPDC headworks site prior to 1969, which remains in operation (City of Seattle 1969:14; City Light 2022c:1-5).

3.5 Comparative Hydroelectric Facilities in Washington

The NCHP is a comparatively small high head hydroelectric facility originally constructed to generate power for the SRHP construction camps. This study reviewed DAHP's online WISAARD to identify other hydroelectric facilities that were constructed for similar purposes and/or are similar in age and scale. This review revealed 21 individually previously documented hydroelectric facilities in Washington. Of these 21 facilities, 18 are from the NCHP's [ea]rly 20th century original period of development but are either large-scale high head projects constructed to provide substantial power for electric-powered transportation or commercial sale, or low head systems, making them inapt for comparison with the NCHP; additionally, one of these 21 facilities was constructed well outside the NCHP's period of development. Two of the 21 properties lack sufficient documentation for comparison. A summary of these 21 hydroelectric facilities and individual justifications for non-comparison is provided in **Table 2**.

Of the 21 previously identified hydroelectric facilities in Washington, only the Meyers Falls Power Plant Historic District (NRHP Reference No. 95000808) is comparable to the NCHP. The Meyers Falls Power Plant is similar in age, scale, and design to the NCHP. It differs from the NCHP in its development and subsequent redevelopment by multiple private power companies for the purpose

of producing power for local distribution to nearby small communities and its rare ownership structure, involving the private lease of the site to the series of private companies that have operated the facility. The Meyers Falls Power Plant is on the Coquille River south of Kettle Falls in Stevens County, Washington. It was constructed in 1916 by the Stevens County Power and Light Company (SCPLC) of Colville. The property was listed in the NRHP in 1995.

Northwest Light & Power Company (NLPC) of Colville built the first hydroelectric development at the Meyers Falls site in 1903, consisting of a small wing dam at the head of the Coville River's lower falls that diverted water by metal pipe to a wood frame powerhouse on the south bank of the river downstream to the west. This facility provided local power to the vicinity communities of Meyers Falls and Kettle Falls, as well as nearby Colville. NLPC's expansion of its distribution system in 1904 to include Blue Creek, Marble, Orin, and Chewelah necessitated improvements to the original Meyers Falls facility. NLPC constructed a new concrete powerhouse near the site of the original powerhouse between 1909 and 1910, which contained a second generator in addition to the 1903 generator and built a new 5-foot-diameter steel conduit dropping 600 feet from the top of Meyers Falls through the adjacent cliff to the new powerhouse (Bruce 1995:8-18–8-19).

SCPLC acquired the facility in 1913 and upgraded the Meyers Falls facility substantially between 1915 and 1916, first constructing a wood dam further upstream to impound a reservoir. This structure was replaced by the extant concrete spillway dam in 1961. Following the reservoir dam's construction, an intake structure was built west of the dam that diverted water into a newly constructed diversion canal. The canal conveyed water approximately 360 feet to the penstock intake, above a new powerhouse constructed on the north bank of the Coville River. The 325-foot penstock dropped over 100 feet to the powerhouse below, supported by two concrete piers and regularly spaced concrete saddles, and split just as it entered the powerhouse to service its two turbines. The powerhouse was a flat-roofed poured concrete and reinforced steel building, with fenestration consisting of multi-paned, wood, double-hung windows. The 1903 and 1910 generators were moved to the new powerhouse following its construction. The 1903 and 1910 powerhouse buildings were abandoned by SCPLC after 1916 (Bruce 1995:7-4–7-9. 8-19). The Meyers Falls Power Plant was acquired by WWPC (now Avista) in 1929, which has since maintained operation of the property (Bruce 1995:8-19). A map of the features of the Meyers Falls Power Plant District as documented in 1995 is shown in **Figure 16**.

The Meyers Falls Power Plant was constructed 4 years prior to the NCHP. Its overall design is similar to that of the NCHP, though it differs in its use of a reservoir as a water source and canal as part of its water conveyance system. Though originally constructed to divert water directly from the Coville River upstream of Meyers Falls to its powerhouse, a design similar to that of the NCPDC headworks, the 1916 iteration of the facility included a dam that impounded a reservoir further upstream on the river. This increased and better regulated the volume of water available to the facility and likely was required by SCPCL's need for greater production capacity to support a larger and growing distribution area. The overall design of the Meyers Falls Power Plant is otherwise similar to the NCHP, consisting of dam and intake structures, a water conveyance system, and a powerhouse with [ea]rly 20th century power generating equipment. However, the design of both the dam and intake structures and water conveyance system of the Meyers Falls Power Plant differ from the NCPDC. The dam and intake structures that are typically combined as a headworks are detached from each other, with the intake structure located west of the dam on the edge of the reservoir. The water conveyance system also varies slightly in its use of a canal rather than a power tunnel to convey water to the penstock. The system is smaller overall, as its water conveyance system is only

about 700 feet from the reservoir to the powerhouse, combining the lengths of its canal and penstock. Comparatively, the NCPDC's water conveyance system is over 3,377 feet long (combining the lengths of the power tunnel and penstock). This greater distance is largely a factor of the NCPDC's siting in the mountainous environment of the North Cascades, though the design also serves to increase the overall production capacity of the NCHP, as the velocity of water increases over longer distances and thus increases the power production of the generating equipment.

The Meyers Falls Power Plant differs from the NCHP most substantially in its private development and purpose. The facility was developed initially and subsequently redeveloped by three private power companies, NLPC, SCPLC, and WWPC. The Meyers Falls Power Plant was designed and constructed to produce power for commercial sale, primarily for industrial uses, such as the sawmills and mining operations in the vicinity of Kettle Falls in Stevens County (Bruce 1995: 8-18–8-19). The facility also has a rare ownership structure, in which the site was and continues to be leased to a private utility by the Meyers family of Kettle Falls. Conversely, the NCHP was developed and has always been owned and operated by a municipal utility company. While it transitioned to producing power for local use in the latter half of the 20th century, it was originally constructed to produce power for City Light's construction camps for the first of three facilities designed and built for large-scale commercial power production within the SRHP.

The NCHP is unique among previously recorded historic hydroelectric facilities in Washington. It is much smaller in scale than almost all other recorded facilities of a similar age and the only one of its scale to be developed by a municipal utility. Most significant, however, is the purpose of its original design. While the historic context has demonstrated that the construction of small-scale hydroelectric facilities was common to facilitate the construction of larger commercial hydroelectric power production facilities or other public infrastructure projects, such as USBR reservoirs, the NCHP is the only documented facility of this type in the state of Washington to date. Furthermore, it is an example of how these small-scale facilities were transitioned to produce power for other purposes, such as production for local use, following the completion of the major project with which they were associated.

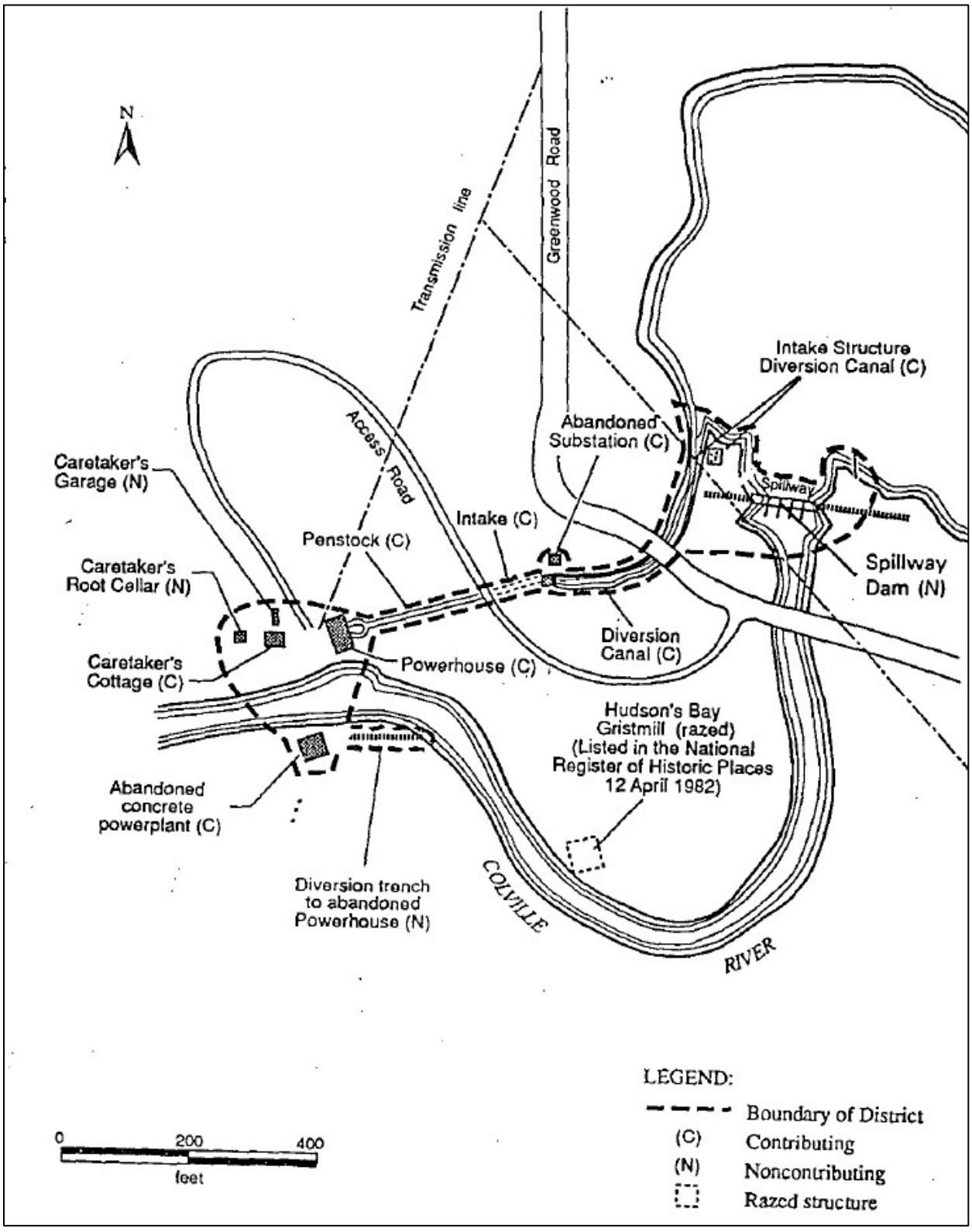
Table 2. Dissimilar Previously Recorded Individual Hydroelectric Facilities in Washington

No.	NRHP Reference No. / WISSARD ID No.	Name	Location	Build Date	Eligibility Status	Justification for Non-Comparison
1	92001324	Snoqualmie Falls Hydroelectric Power Plant District	0.5 mile north of Snoqualmie, on Highway 202, Snoqualmie, King County, WA	1898	Listed - Criteria A	Large-scale private project
2	ID 706248	Electron Hydroelectric Project Diversion Dam	19318 Electron Rd E, Orting, Washington	1903	No Determination	Large-scale private project
3	ID 12090	North Yakima Hydroelectric Plant	2000 W Lincoln Ave, Yakima, WA	c. 1905	No Determination	Power plant only, insufficient information [a]
4	88002735	Nooksack Hydroelectric Power Plant	Route 542, on Nooksack River, Glacier, Whatcom County, WA	1906	Listed - Criteria A and C	Large-scale private project
5	88002737	Little Falls Hydroelectric Power Plant	Spokane Falls, Reardon, Stevens/Lincoln County, WA	1910	Listed - Criteria A and C	Low head system
6	N/A[a]	Condit Hydroelectric Power Plant	White Salmon River, Underwood, Skamania County, WA	1913	Listed - Criteria A and C	Large-scale private project
7	ID 12299	Naches Drop Hydroelectric Plant	Vicinity of Naches, Yakima County, WA	1914	No Determination	Power plant only, insufficient information [a]
8	88002738	Long Lake Hydroelectric Power Plant	Spokane River, Ford, Stevens/Lincoln County, WA	1915	Listed - Criteria A and C	Large-scale private project
9	88002736	Lower Baker Hydroelectric Power Plant	Baker River at southern end of Shannon Lake, Concrete, Skagit County, WA	1924	Listed - Criteria A and C	Large-scale private project
10	88002742	Glines Hydroelectric Power Plant	North end of Lake Mills at Elwha River, Port Angeles, Clallam County, WA	1927	Listed - Criteria A and C	Large-scale private project
11	90001861	Nine Mile Hydroelectric Power Plant	Charles Road near River Mile 58 on Spokane River, Nine Mile Falls, Spokane County, WA	1906–1908	Listed - Criteria A	Large-scale private project
12	88002741	Elwha Hydroelectric Power Plant	North end of Lake Aldwell, Port Angeles, Clallam County, WA	1912–1914	Listed - Criteria A and C	Low head system
13	89000499	Gorge Hydroelectric Power Plant	Newhalem, Whatcom County, WA	1919–1924	Listed - Criteria A and C	Large-scale public project

No.	NRHP Reference No. / WISSARD ID No.	Name	Location	Build Date	Eligibility Status	Justification for Non-Comparison
14	14001244	Cushman Hydroelectric Historic District	21451 N. Highway 101, Hoodsport, Mason County, WA	1925–1933	Listed - Criteria A	Large-scale public project
15	88002759	Cushman No. 1 Hydroelectric Power Plant	Skokomish River, Hoodsport, Mason County, WA	1925–1933	Listed - Criteria A and C	Large-scale public project
16	88002757	Cushman No. 2 Hydroelectric Power Plant	Skokomish River, Hoodsport, Mason County, WA	1925–1933	Listed - Criteria A and C	Large-scale public project
17	89000498	Diablo Hydroelectric Power Plant	Newhalem, Whatcom County, WA	1927–1929	Listed - Criteria A and C	Large-scale public project
18	ID 710477	Rock Island Hydroelectric Project - Headworks and Spillway	Rock Island Dam, Douglas County, WA	1933, 1953	No Determination	Large-scale private project
19	ID 25855	Yale Hydroelectric Dam	Clark County, WA	1951–1953	No Determination	Large-scale private project; outside NCHP period of construction
20	100002394	Boundary Hydroelectric Power Plant	1198 Boundary Dam Access Road, Metaline, Pend Oreille County, WA	1963–1967	Listed - Criteria A and C	Large-scale public project

[a] These properties were recorded by DAHP in 1982. However, current documentation is insufficient to provide any comparative contextual information.

Figure 16. Map of the Meyers Falls Power Plant Historic District



Source: Bruce 1995.

Chapter 4
Records Review Findings

This chapter summarizes records review findings, including historic properties previously recorded in the WISAARD database and historic built environment properties identified in the NPS Gallery Digital Asset database as previously listed in the NRHP.

4.1 Historic Built Environment Resources Previously Recorded in WISAARD

Eight historic built environment resources previously recorded in WISAARD were identified in the APE. No previously recorded historic-age built environment resources were identified within a 0.25-mile radius outside of the APE. A summary is provided in **Table 3**. Of these eight properties, one is listed in the WHR and NRHP, one was determined eligible for listing in the NRHP, and six have not been individually evaluated. Three of the eight properties were evaluated as eligible contributors to the SRNCHP (DT 66) historic district: Skagit/ Newhalem/Gorge – Suspension Bridge (WISSARD ID 103436), Locomotive #6, Seattle Skagit River Railway (WISSARD ID 103511), and Skagit/ Newhalem – Cookhouse (Gorge Inn) (WISSARD ID 103518. The Skagit/ Newhalem – Trail of the Cedars Suspension Bridge (WISAARD ID 103521) was evaluated as not eligible as a contributor to the historic district. Of the four remaining properties, only the Ladder Creek Water Supply System (WISAARD ID 705331) is within the historic district's boundaries.

4.2 Historic Districts Previously Listed in the National Register of Historic Places

The NPS NRHP records are available via the NPS Gallery Digital Asset database (NPS 2023a). A records search was conducted to identify known NRHP-listed historic districts in the APE and within 0.25-mile radius of the APE. The APE overlaps with two historic districts listed in the NRHP: the Skagit River and Newhalem Creek Hydroelectric Project and the Gorge Hydroelectric Power Plant (WH413). Details for these two historic districts are summarized in **Table 4**. The boundaries of the SRNCHP (DT 66) and its overlap with the project boundary and APE in the vicinity of Newhalem is shown in **Figure 17.** Contributing resources to the SRNCHP (DT 66) within the APE are summarized in **Table 6** in Chapter 5 (see *Summary of the 2010 Skagit River and Newhalem Creek Hydroelectric Projects NRHP Listing*).

Table 3. Historic-age Properties Recorded in WISAARD (within 0.25 Mile of the APE)

No.	HPI Property ID/Name	Site Type	Address	Build Date	Individual NRHP Eligibility Status	SRNCHP (DT 66) Contributor/ Non-contributing	Distance and Direction from APE	Distance and Direction from Nearest Aboveground Project Activity
1	103420/ Skagit/ Newhalem – School Gymnasium	Government Building	Seattle City Light St South side of Highway 20, west end of town Newhalem, WA 98283	c. 1947	No Determination	Located outside of Town of Newhalem (Historic Area "A"), not evaluated as a contributor to SRNCHP (DT 66)	Within APE	Approximately 365 feet northwest
2	103436/ Skagit/ Newhalem/Gorge – Suspension Bridge	Structure /Bridge	Ladder Creek Ln East side of Highway 20, east of Gorge Powerhouse Newhalem, WA 98283	c. 1951	No Determination	Contributing to SRNCHP (DT 66) in 2010 NRHP Nomination update	Within APE	Within project boundary
3	103511/ Locomotive #6, Seattle Skagit River Railway	Object	State Highway 20, Newhalem, WA	1928	Listed individually the Washington Heritage Register	Listed in the NRHP as a contributor to the SRNCHP (DT 66); Listed in the Washington Heritage Register	Within APE	Approximately 1,320 feet northeast
4	103518/ Skagit/ Newhalem – Cookhouse (Gorge Inn)	Government Building	Main St South side of Highway 20, east side of street Newhalem, WA 98283	1920	No Determination	Contributing to SRNCHP (DT 66).	Within APE	Approximately 1,214 feet east-northeast
5	103521/ Skagit/ Newhalem – Trail of the Cedars	Structure /Bridge	South side of Highway 20, end of Main Street	c. 1975	No Determination	Non-contributing to SRNCHP (DT 66) in 2010 NRHP Nomination update	Within APE	Approximately 1,056 feet east

No.	HPI Property ID/Name	Site Type	Address	Build Date	Individual NRHP Eligibility Status	SRNCHP (DT 66) Contributor/ Non-contributing	Distance and Direction from APE	Distance and Direction from Nearest Aboveground Project Activity
	Suspension Bridge		Newhalem, WA 98283					
6	103533/ Skagit/ Newhalem – Quadraplex 101, 201, Fire Station	Residential Building/ Government Building	Cherry Blossom Ln South side of Highway 20 Newhalem, WA 98283	1963	No Determination	Outside of Town of Newhalem (Historic Area "A"), not evaluated as a contributor to SRNCHP (DT 66)	Within APE	Approximately 25 feet west
7	705331/ Ladder Creek Water Supply System	Structure	Newhalem, WA 98283	c. 1920	Determined Not Eligible	Located within Gorge Powerhouse and Dam Complex (Historic Area "B"), not evaluated as a contributor to SRNCHP (DT 66) in 2010 NRHP nomination update. Recommended contributor to DT 66 in 2016.	Within APE	Approximately 350 feet northeast
8	723917/ Skagit River Road Bridge (#9470-015P)	Structure	Newhalem, WA 98283	1959	No Determination	Located outside of NRHP district boundary, not evaluated as a contributor to SRNCHP (DT 66)	Within APE	Approximately 2,640 feet west

HPI = Historic Property Inventory; WA = Washington; c. = circa; NRHP = National Register of Historic Places; APE = Area of Potential Effects

Table 4. NRHP Listed Historic Districts (within 0.25 Mile of the APE)

NRHP Number / Smithsonian Number	Property Name	NRHP Boundary Description	Period of Significance	Contributing Properties	NRHP Criteria; Significance
11000016 [a] DT 66	Skagit River and Newhalem Creek Hydroelectric Projects	The boundaries of the historic district extend in a roughly linear, but disconnected, fashion along the Skagit River, from approximately the town of Newhalem including the NCPDC to the RPDC.	1917–1961	Contributing: 46 buildings, 1 site, 10 structures, 1 object. Non-contributing: 9 buildings, 1 site, 3 structures, 0 objects	A, B and C; Represents a significant, cohesive collection of resources that reflect the historic period of City Light's hydroelectric development of the Skagit River
89000499 [b, c] WH613	Gorge Hydroelectric Power Plant	The boundary of the nominated property is delineated by the polygon whose vertices are marked by the following UTM points: A 10 629660 5392620, B 10 629580 5392720, C 10 631790 5395200, D 10 631870 5395400, E 10 632120 5395120. Part of a Multiple Property Listing for Hydroelectric Power Plants in Washington State, 1890-1933.	1918–1939	Contributing: 1 building, 0 sites, 6 structures, 0 objects Non-contributing: 0 buildings, 0 sites, 1 structure, 0 objects	A and C; Represents a significant, cohesive collection of resources that reflect the Gorge Hydroelectric Power Plant's historically significant role in the development of a major regional power supply system and is closely associated with the expansion of the Seattle City Light municipal utility

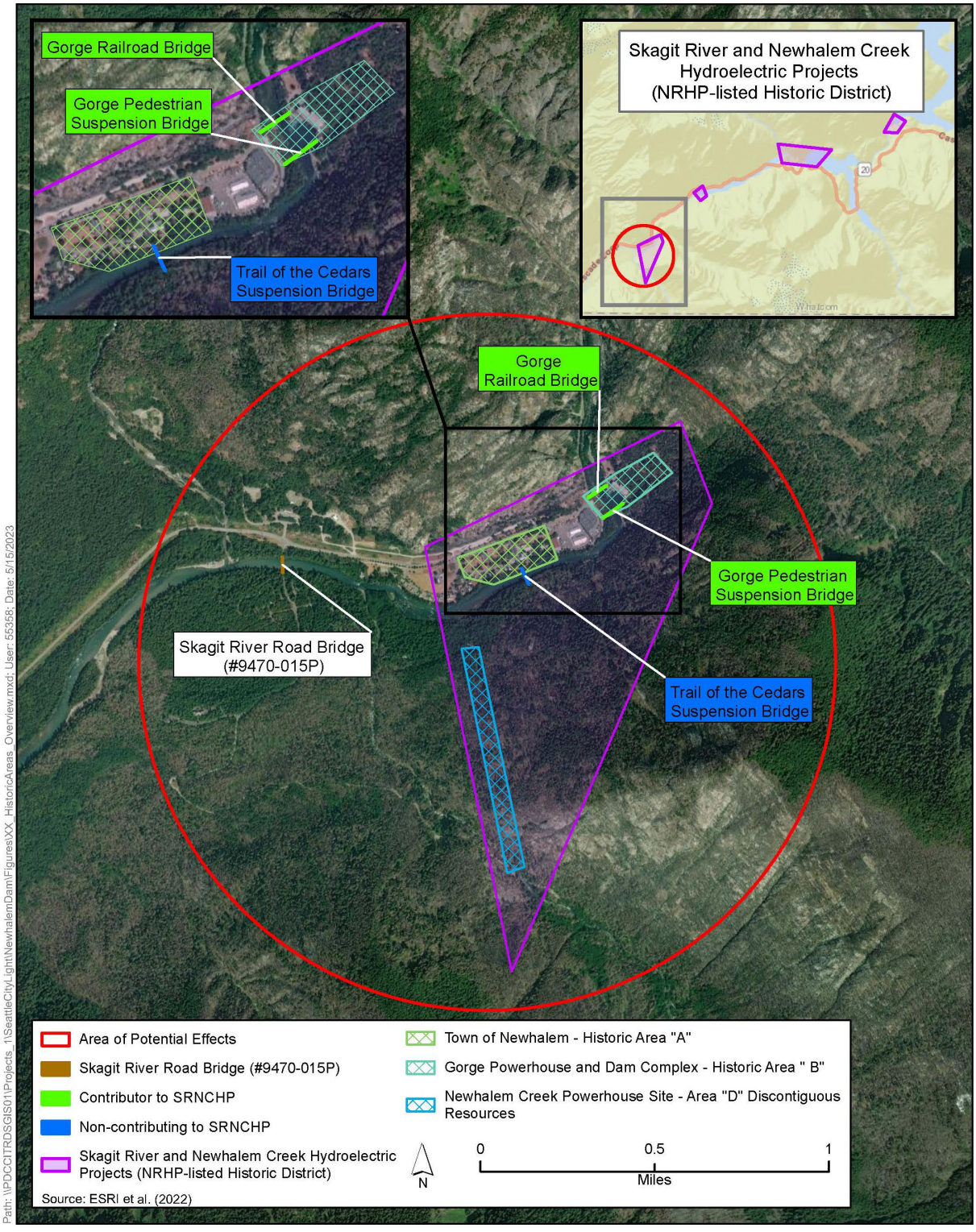
NRHP = National Register of Historic Places; NCPDC = Newhalem Creek Powerhouse and Dam Complex; RPDC = Ross Powerhouse and Dam Complex

[a] For more information about the Skagit River and Newhalem Creek Hydroelectric Project's NRHP listing see *National Register of Historic Places Nomination for Skagit River and Newhalem Creek Hydroelectric Projects, Whatcom County, Washington* (Johnson 2010).

[b] District boundaries of the Gorge Hydroelectric Power Plant are superseded by the district boundaries of the Skagit River and Newhalem Creek Hydroelectric projects (11000016), as the contributing properties to the Gorge Hydroelectric Power Plant were included in the updated listing for the Skagit River and Newhalem Creek Hydroelectric projects in 2010. Therefore, representations of the overlap of NRHP district boundaries with the APE and effects analysis in this report reflect only the information in the 2010 NRHP listing for the Skagit River and Newhalem Creek Hydroelectric projects.

[c] For more information about the Gorge Hydroelectric Power Plant see *National Register of Historic Places Nomination for Gorge Hydroelectric Power Plant* (Soderberg 1988b).

Figure 17. Boundaries of Skagit River and Newhalem Creek Hydroelectric Projects and overlap with the project boundary and APE



Chapter 5
Survey Results

This chapter presents the results of the historic built environment survey, which includes documentation and evaluation of eligibility for nine properties in the APE (one building, five structures, and three linear resources) for individual listing in the NRHP and as contributors to the SRNCHP (DT 66) historic district.

In addition, recommendations are included for future updates to the existing SRNCHP (DT 66)'s historic district NRHP listing. Proposed items include expanding the statement of significance to fully address all six of the NCHPs components, the powerhouse, headworks, penstock, power tunnel, tailrace, and transmission line, as well as the associated Newhalem Creek Bridge, trail network, and access roads; adding these resources within the district boundary of the SRNCHP (DT 66) and including their eligibility status (e.g., contributing vs. non-contributing); creating a separate historic area for the NCHP components consistent with the other historic areas for the power generation facilities within SRNCHP (DT 66); and expanding the SRNCHP (DT 66)'s period of significance from 1917–1961 to 1917–1970, beginning the year that the Skagit River project was first conceptualized by City Light and ending with the year that the NCPDC powerhouse began producing power again.

As a result of the survey, six properties are recommended eligible for listing in the NRHP as contributors to the SRNCHP (DT 66) historic district (powerhouse, headworks, penstock, power tunnel, Newhalem Creek Bridge, and trail network) and three properties are recommended as non-contributors to the SRNCHP (DT 66) historic district (tailrace, transmission line, access roads,). All nine properties are recommended not eligible for individual listing in the NRHP. Each property was recorded on a Historic Property Inventory Form (HPIF) per current DAHP reporting standards for eventual upload into WISAARD. A summary of historic built environment NRHP eligibility recommendations is provided in **Table 5**. Following the table, a map illustrating the eligibility recommendations is provided in **Figure 18**. Complete eligibility evaluations for the properties are available in the HPIFs included in Appendix A, *Historic Property Inventory Forms*. Evaluations include historic context, significance assessment, property description with integrity analysis, and eligibility recommendations (district and individual) under NRHP Criteria A, B, C, and D.

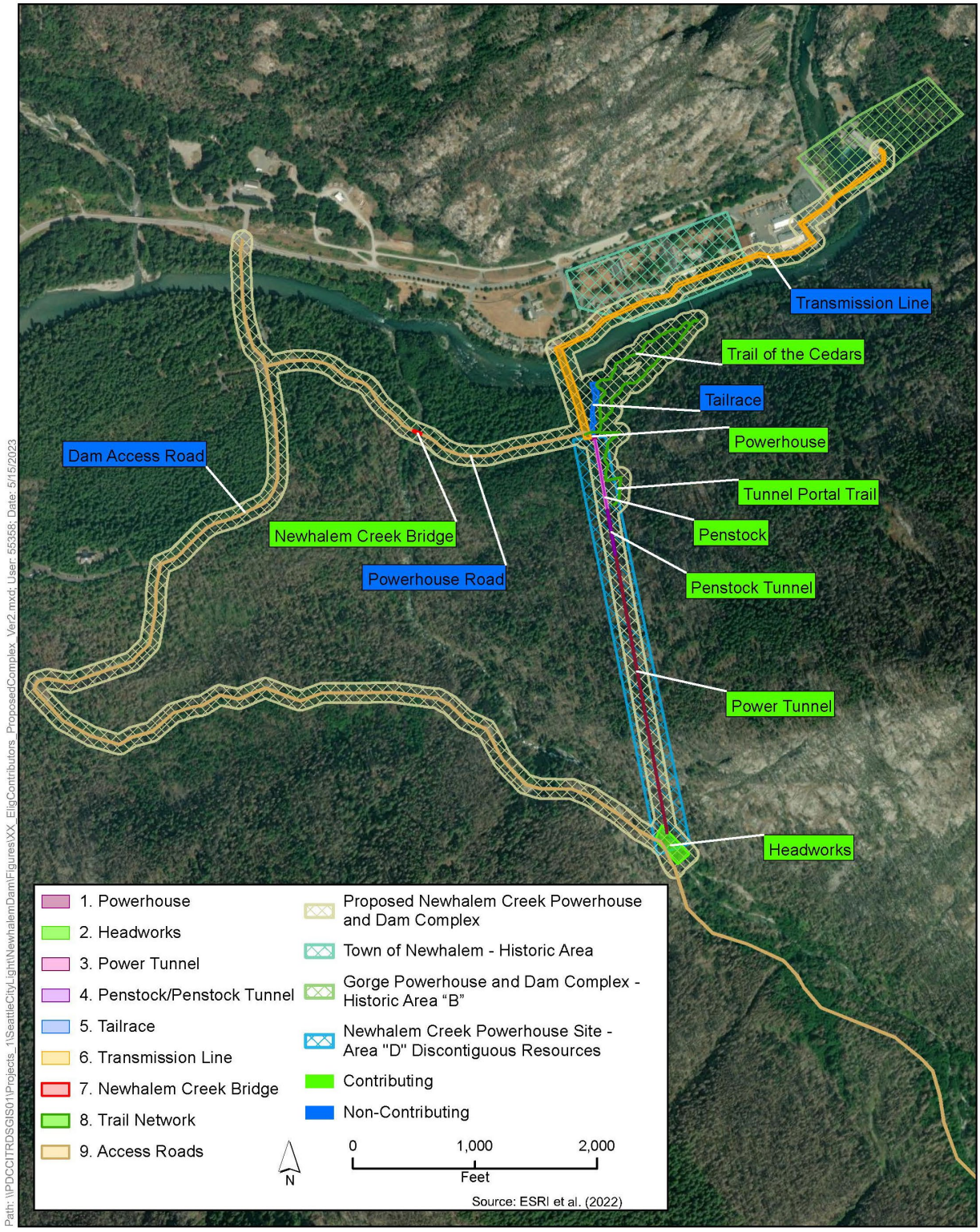
Table 5. Eligibility Recommendations Summary for Survey Built Environment Resources

Map ID	HPI Property ID	Property Name, Address	Individually Eligible	District Status	Significance	Period of Significance
1	729310	Powerhouse Vicinity Newhalem, Whatcom County, WA	Not Eligible	Contributor (Criteria A and C)	Contributes to SRNCHP (DT 66), representing the powerhouse reconstruction and related improvements to the NCHP in 1967–1970 to continue operation as a local production and support facility (Criterion A); and as one component of the cohesive and intact collection of engineered components that reflect the engineering significance of the 1969 components NCHP (Criterion C).	1967–1970 (Criterion A); 1969 (Criterion C)
2	729311	Headworks Vicinity Newhalem, Whatcom County, WA	Not Eligible	Contributor (Criteria A and C)	Contributes to SRNCHP (DT 66), representing the redevelopment of the NCHP in 1967–1970 to continue operation as a local production and support facility (Criterion A) and as one component of the cohesive and intact collection of engineered components that reflect the engineering significance of the 1969 components NCHP (Criterion C).	1967–1970 (Criterion A); 1969 (Criterion C)
3	729312	Power tunnel Vicinity Newhalem, Whatcom County, WA	Not Eligible	Contributor (Criteria A, B, and C)	Contributes to SRNCHP (DT 66), representing both the original NCHP development in 1918–1921 for construction power production and the redevelopment of the NCHP in 1967–1970 to continue operation as a local production and support facility (Criterion A); is significantly associated with J.D. Ross (Criterion B); and as one component of the cohesive and intact collection of engineered components that reflect the engineering significance of both the 1921 and 1969 NCHP (Criterion C).	1918–1921 and 1967–1970 (Criterion A); 1918–1939 (Criterion B); 1921 and 1969 (Criterion C)

Map ID	HPI Property ID	Property Name, Address	Individually Eligible	District Status	Significance	Period of Significance
4	729313	Penstock Vicinity Newhalem, Whatcom County, WA	Not Eligible	Contributor (Criteria A, B, and C)	Contributes to SRNCHP (DT 66), representing both the original NCHP development in 1918–1921 for construction power production and the redevelopment of the NCHP in 1967–1970 to continue operation as a local production and support facility (Criterion A); is significantly associated with J.D. Ross (Criterion B); and as one component of the cohesive and intact collection of engineered components that reflect the engineering significance of both the 1921 and 1969 NCHP (Criterion C).	1918–1921 and 1967–1970 (Criterion A); 1918–1939 (Criterion B); 1921 and 1969 (Criterion C)
5	729314	Tailrace Vicinity Newhalem, Whatcom County, WA	Not Eligible	Non-contributing	Altered, lacks integrity to convey significance.	NA
6	729315	Transmission line Vicinity Newhalem, Whatcom County, WA	Not Eligible	Non-contributing	Altered, lacks integrity to convey significance.	NA
7	729316	Newhalem Creek Bridge Vicinity Newhalem, Whatcom County, WA	Not Eligible	Contributor (Criteria A and C)	Contributes to SRNCHP (DT 66), representing the redevelopment of the NCHP in 1967–1970 to continue operation as a local production and support facility (Criterion A) and as the only intact beam bridge constructed by City Light in the SRNCHP (DT 66) after World War II (Criterion C).	1968–1970 (Criterion A); 1968 (Criterion C)
8	730063	Trail Network, Vicinity Newhalem, Whatcom County, WA	Not Eligible	Contributor (Criterion A)	Contributes to SRNCHP (DT 66), for its association with the original NCHP development in 1918–1921 and City Light's use of the NCHP as part of promotional tours from 1924–1970 (Criterion A).	1920; 1970 (Criterion A)
9	730064	Access Roads, Vicinity Newhalem, Whatcom County, WA	Not Eligible	Non-contributing	Lacks significance.	NA

HPI = Historic Property Inventory; NRHP = National Register of Historic Places; NA = not applicable; NCHP = Newhalem Creek Hydroelectric Project; SRNCHP (DT 66) = Skagit River and Newhalem Creek Hydroelectric Projects

Figure 18. Historic built environment resources NRHP eligibility recommendations



The records search also identified three historic-age (50 years or older) bridges in the APE that were previously recorded in WISAARD but do not have determinations of individual NRHP eligibility: 1) Skagit River Road Bridge (#9470-015P), built in 1959 and previously recorded in WISAARD as Historic Property ID 723917; 2) Skagit/Newhalem/Gorge Suspension Bridge, built in circa 1951 and previously recorded in WISAARD as Historic Property ID 103436; and 3) Skagit/Newhalem – Trail of the Cedars Suspension Bridge, built circa 1975 and previously recorded in WISAARD as Historic Property ID 103521. The Skagit River Road Bridge (#9470-015P) was not evaluated for individual NRHP eligibility as part of this study because the ACHP Program Comment issued for streamlining Section 106 review for undertakings affecting post-1945 concrete and steel bridges applies and, thus, is exempt from review (ACHP 2012). Per Section IV, Considerations, Subsection B, the ACHP Program Comment does not apply to the Skagit/Newhalem/Gorge Suspension Bridge and Skagit/Newhalem – Trail of the Cedars Suspension Bridge as federal agencies may not use the ACHP Program Comment for suspension-type bridges (ACHP 2012).

The Skagit/Newhalem/Gorge – Suspension Bridge is listed in the NRHP as a contributing resource to the NRHP-listed SRNCHP (DT 66). While the resource was recorded in WISAARD in 2009 as part of the 2010 NRHP update, no eligibility recommendations were made by the consultant author. The property's record does not speak to individual eligibility, so for the purposes of this study it is assumed to be individually eligible for listing in the NRHP and is included in the effects assessment of this report.

The Skagit/Newhalem – Trail of the Cedars Suspension Bridge's northern end is within the historic district's boundaries but is not eligible as a contributor to the NRHP-listed SRNCHP (DT 66) in the 2010 NRHP update. Per WISAARD, the property had been recorded in 2009 and the consultant author recommended it as not eligible for individual eligibility since the property was less than 50 years old at the time. DAHP did not provide a response or concurrence for this recommendation. It is 85 feet from the nearest point of the project boundary but is 1,056 feet from the location of the nearest aboveground project activity. As such, it is not included in the effects assessment because project activities are too far from the bridge to have a potential to affect the property.

Skagit/Newhalem – Quadraplex 101, 201, Fire Station was recorded on an HPIF in 2009 and the consultant author recommended it as not eligible for individual listing nor as a contributor to the SRNCHP (DT 66) due to alterations. DAHP did not provide concurrence or response for this recommendation. However, for the purposes of this study it is assumed to be individually eligible for listing in the NRHP and is included in the effects assessment of this report.

Three of the five other properties summarized in **Table 3** were either not evaluated for individual eligibility or are contributing to a historic district and are not included in the effects assessment because project activities are too far to have a potential to affect the property.

- **Locomotive/Engine #6.** Listed as a contributor to the SRNCHP (DT 66). It is approximately 350 feet from the nearest point of the project boundary and approximately 1,320 feet from the location of the nearest aboveground project activity.
- **Skagit/Newhalem – Cookhouse (Gorge Inn).** Skagit/Newhalem – Listed as a contributor to the SRNCHP (DT 66). It is approximately 40 feet from the nearest point of the project boundary and approximately 1,214 feet from the location of the nearest aboveground project activity.
- **Skagit/Newhalem – School Gymnasium.** Per WISAARD it was recorded in 2009 on an HPIF, and the consultant author recommended it as not eligible for individual listing in the NRHP due to substantial alterations and lack of historic integrity, nor as a contributor to the SRNCHP (DT

66). It is outside the boundaries of the above historic district's "Town of Newhalem – Historic Area A." The property is approximately 365 feet from the nearest point of the project boundary and the location of the nearest aboveground project activity.

5.1 Summary of the 2010 Skagit River and Newhalem Creek Hydroelectric Projects Historic District NRHP Listing

SRNCHP (DT 66) was listed in the NRHP in 1996 and the nomination updated in 2010 (Erigero 1990; Johnson 2010). The historic district is 3 miles long and extends in a discontiguous linear manner along the north and south banks of, over and across the Skagit River within the RLNRA. Starting in Newhalem and extending east to Ross Dam, it includes the sequence of towns and industrial resources related to the SRNCHP (DT 66) and is grouped into seven discrete historic areas: Historic Area A – Town of Newhalem; Historic Area B – Gorge Powerhouse and Dam Complex; Historic Area C – Diablo Powerhouse Complex; Historic Area D Discontiguous Resources – Diablo Lake; Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site; Historic Area E – Ross Powerhouse and Dam Complex; and Historic Area F – Hollywood Residential Area (Johnson 2010:7-2). The district boundaries are shown in **Figure 17**. The lakes formed by the dams are not included in the district (Johnson 2010:7-2). This boundary aligns with the following NPS (1995) guidance:

> …the National Register excludes from the definition of 'site' natural waterways or bodies of water that served as determinants in the location of communities or were significant in the locality's subsequent economic development. While they may have been 'avenues of exploration,' the features most appropriate to document this significance are the properties built in association with the waterways.

As of 2010, the SRNCHP is listed in the NRHP as significant at the national level under Criteria A, B, and C and has a period of significance of 1917–1961, beginning in the year the SRHP was first conceptualized by City Light and ending with the completion of the Gorge High Dam. The district is listed under Criterion A, in the area of Politics and Government, because it represents almost 50 years of American utility politics and development from the Progressive Era through the decades following World War II. The projects' development ensured the existence of City Light as a municipal utility and was immensely influential on the public power movement over the course of the 20th century. The district is listed under Criterion B, in the areas of Politics and Government, Entertainment/Recreation, and Landscape Architecture, for its association with J.D. Ross, City Light Superintendent for 28 years, and Ross's vision for City Light and public power, in particular hydroelectric power. Ross was instrumental in the projects' development, but also used the projects as a showcase to promote hydroelectric power and municipal utility ownership. The district is also listed under Criterion C, in the areas of Community Planning and Development, Engineering, Architecture, and Transportation for its representation of a general trend of developing more costly and remote hydroelectric sites in the 1920s and for its new and inventive engineering practices, both in the technical construction of the facilities themselves, as well as in the development of municipally owned towns (Newhalem and Diablo, Washington) and the transportation infrastructure required for their construction (Johnson 2010:8-1–8-2).

The district boundary of the SRNCHP (DT 66) partially overlaps with the APE, as shown in **Figure 17**. Twenty-nine contributing resources to the SRNCHP (DT 66), located in Historic Area A – Town of Newhalem, Historic Area B – Gorge Powerhouse and Dam Complex, and Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site, are in the APE. These 29 resources are summarized in **Table 6**. As noted in Chapter 4, Old Engine # Six/Locomotive was also listed individually in the WHR in 1973, and the Gorge Powerhouse was listed in 1989 as a contributing resource to the Hydroelectric Power Plants in Washington State, 1890–1938 Multiple Property Listing under the name of Gorge Hydroelectric Power Plant, a historic district with seven contributing and one non-contributing resource. They have since been incorporated into the SRNCHP (DT 66) historic district.

5.1.1 Recommendation for a Redefined Historic Area within the SRNCHP (DT 66)

Based on review of the 2010 NRHP listing for the SRNCHP (DT 66), and the historic area groupings within, this study recommends reconfiguring the 2010 Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site into a refined historic area that groups and identifies all the components related to the NCPDC. Renaming this to the Newhalem Creek Powerhouse and Dam Complex (NCPDC) brings it in line with the naming and inclusion conventions of the other powerhouse and dam complexes within the 2010 NRHP listing for the SRNCHP (DT 66).

The eligibility evaluation conducted in this report considers each of the four previously identified components of the Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site: powerhouse, the headworks' diversion dam, power tunnel, and penstock. It also includes the previously unidentified components – headworks (diversion dam/apron, sluice way/channel, intake and rock shaft, gatehouse, associated concrete slabs footbridge), the tailrace and fish barrier, transmission line, trail network (Trail of the Cedars and Tunnel Portal Trail), and access roads (Dam Access Road and Powerhouse Road), as singular resources in this reconfigured historic area for the NCPDC.

5.1.2 Eligibility Recommendation for the Newly Redefined Historic Area for the Newhalem Creek Powerhouse and Dam Complex

The 2010 NRHP nomination for SRNCHP (DT 66) listed the powerhouse site as significant under Criteria A, B, and C. Similarly, the refined NCPDC is significant under the same criteria, as follows.

- Criterion A for its association both the original development of the NCHP in 1918–1921 to produce power for City Light's Skagit River construction camp and the construction of the GPDC, and the redevelopment of the NCHP in 1967–1970 to continue operation as a local production and support facility.
- Criterion B for its significant associations with J.D. Ross, the head of City Light from 1911–1939, who was involved substantially in the planning and construction of the SRNCHP (DT 66).
- Criterion C as a cohesive and intact collection of engineered components that reflect the engineering significance of both the original NCHP in 1921 and the redeveloped NCHP in 1969. The reconfigured historic area for the NCPDC has a period of significance of 1918–1970, ranging

from the beginning of planning and construction of the NCHP to the year the redeveloped NCHP began producing power.

The recommended contributing and non-contributing resources to the NCPDC are summarized in **Table 7**.

The NCPDC is in Sections 21 and 28 of Township 37 North, Range 12 East in Newhalem in Whatcom County, Washington and within the RLNRA boundary in the vicinity of Newhalem. The location and boundaries of the proposed NCPDC and its contributing and non-contributing resources are shown in **Figure 18**. The recommended historic area/boundary for the NCPDC follows the alignments of linear resources with an expanded boundary around clusters of resources in the vicinity of the powerhouse and headworks. It encompasses its six contributing resources (Map IDs 1, 2, 3, 4, 7, and 8), the powerhouse, headworks (including all elements), power tunnel, penstock, Newhalem Creek Bridge, and trail network (including both trails), as well as its three non-contributing resources (Map IDs 5, 6, and 9), the tailrace, transmission line, and access roads (including both roads). This approach is consistent with the approach to Historic Area boundaries within the SRNCHP (DT 66), which include both contributing and non-contributing resources.

Beginning at the headworks cluster, the boundary includes the buffered footprint of the headworks. Heading north the boundary includes the buffered footprint of the power tunnel and penstock alignments, and the Tunnel Portal Trail (a component of the trail network). At the powerhouse, the boundary branches to the north and northeast to include the buffered loop of the Trail of the Cedars (a component of the trail network), buffered footprint of the tailrace, and buffered footprint of the transmission line. The boundary is completed by a branch to the west of the powerhouse to the North Cascades Highway (Highway 20), along the buffered footprint of Powerhouse Road and Dam Access Road, and then back to the headworks cluster along the buffered footprint of Dam Access Road.[3]

[3] Portions of the NCPDC boundary extend beyond the project boundary indicated in City Light's *Newhalem Creek Hydroelectric Project (FERC No. 2705) Application for Surrender of License* (Figure 1) (City Light 2022c). This includes the access roads and trail network resources.

Table 6. Contributing Resources to the Skagit River and Newhalem Creek Hydroelectric Projects in the APE

No.	NRHP-Listing Property No.	Property Name	Contributes to Historic Area
1	1	Silk Stocking Row House #8	A – Town of Newhalem
2	2	Silk Stocking Row House #7	A – Town of Newhalem
3	3	Silk Stocking Row House #6	A – Town of Newhalem
4	4	Silk Stocking Row House #5	A – Town of Newhalem
5	5	Silk Stocking Row House #4	A – Town of Newhalem
6	6	Silk Stocking Row House #3	A – Town of Newhalem
7	7	Silk Stocking Row House #2	A – Town of Newhalem
8	8	Silk Stocking Row House #1	A – Town of Newhalem
9	9	Schoolteacher's House (House #222)	A – Town of Newhalem
10	12	Commissary/General Store	A – Town of Newhalem
11	13	Bunkhouse #13 (Pansy House)	A – Town of Newhalem
12	14	New Cook's Bunkhouse (Bunkhouse #10)	A – Town of Newhalem
13	15	Mess Hall (Gorge Inn)	A – Town of Newhalem
14	16	Old Cook's Bunkhouse (library)	A – Town of Newhalem
15	17	Tourist Dormitory #70 (Bunkhouse #70)	A – Town of Newhalem
16	18	USGS Stream Gauging Station	A – Town of Newhalem
17	19	Old Engine # Six/Locomotive	A – Town of Newhalem
18	20	Fire Hall	A – Town of Newhalem
19	21	Tourist Restroom (Visitor's Center)	A – Town of Newhalem
20	22	Currier Hall	A – Town of Newhalem
21	23	Totem Pole	A – Town of Newhalem
22	27	Gorge Powerhouse	B – Gorge Powerhouse & Dam Complex
23	28	Gorge Railroad Bridge	B – Gorge Powerhouse & Dam Complex
24	29	Gravity Oil Tank House	B – Gorge Powerhouse & Dam Complex
25	30	Ladder Creek Falls Gardens	B – Gorge Powerhouse & Dam Complex
26	31	Gorge Pedestrian Suspension Bridge	B – Gorge Powerhouse & Dam Complex
27	25	Ross Crypt, Newhalem [a]	A – Town of Newhalem
28	26	Newhalem Creek Powerhouse Site	D – Discontiguous Resources
29	92	Communications Building	A -Town of Newhalem

[a] The Newhalem Creek Powerhouse Site description in the SRNCHP (DT 66) listing included the powerhouse, dam, penstock, and power tunnel (Johnson 2010:7-44).

Table 7. Recommendations for Contributing and Non-contributing Resources to the Newhalem Creek Powerhouse Complex (1918–1970)

Map ID	Historic Name	Type of Resource	Date	Status
1	Powerhouse	Building	1969	Contributing
2	Headworks • Diversion dam/apron • Sluice way/channel • Intake and rock shaft • Gatehouse • Associated concrete slabs • Footbridge	Structure	1969	Contributing
3	Power tunnel	Structure	1921	Contributing
4	Penstock	Structure	1921	Contributing
5	Tailrace	Structure	1921	Non-contributing
6	Transmission line	Structure	1965	Non-contributing
7	Newhalem Creek Bridge	Structure	1968	Contributing
8	Trail Network • Trail of the Cedars • Tunnel Portal Trail	Site	c. 1921–1987	Contributing
9	Access Roads • Dam Access Road • Powerhouse Road	Site	c. 1919–c. 1969	Non-contributing

5.2 NRHP Eligibility Evaluations for Singular/Identified Properties within the Newhalem Creek Hydroelectric Project

This section summarizes the eligibility evaluations for each of the singular/identified properties found within the NCPDC for the SRNCHP (DT 66) historic district and the recommended NCPDC, a redefined historic area within the SRNCHP (DT 66): Powerhouse (Map ID 1); Headworks (Map ID 1); Power tunnel (Map ID 3); Penstock (Map ID 4); Tailrace (Map ID 5); Transmission line (Map ID 6); Newhalem Creek Bridge (Map ID 7); Trail network (Map ID 8); and Access roads (Map ID 9). Each evaluation includes the following:

- A physical description.
- A statement of significance regarding the historic context it relates to (e.g., NCPDC, SRNCHP (DT 66), both or neither).
- An analysis under each NRHP criteria (e.g., A, B, C, and D) to determine under which criteria it qualifies.
- An integrity evaluation applying the seven aspects of integrity with an overall recommendation.
- An evaluation and recommendation for NRHP individual and/or district eligibility.

5.2.1 Powerhouse (Map ID 1)

5.2.1.1 Description

The powerhouse is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA. The powerhouse was constructed from 1967–1969, designed by City Light with the design being attributed to City Light engineer William L. Freitas (b. 1934, d. 2022), and built by the W.H. Gregory Company (*Seattle Times* 1975:37; Johnson 2010:7-44; City Light 1968e:27).

Freitas designed the 1969 powerhouse to resemble the 1921 powerhouse at the request of NPS to preserve some of its historical value and be compatible with its forest setting in the RLNRA, replicating some of the original rustic design elements and the use of rough timber in its construction (City of Seattle 1969:27-28; City Light 1968e:27). Features of the 1969 design that evoke the original powerhouse included its simple, single-story, side-gabled form and rectangular plan; its natural cedar board-and-batten siding; and fixed-wood windows. (City Light 1969e; City Light 1968e:27). However, the 1969 powerhouse differed from the 1921 design in its roof. While the 1921 building had a simple gabled roof clad in corrugated metal, the 1969 design used hand-split cedar shake for its roof cladding and featured exposed and stylized rafter ends (City Light 1919a, 1969e). These material and decorative flourishes aligned more closely with the "rustic" architectural influences established by USFS and NPS duri[ng] the 20th century and seen elsewhere in the SRNCHP (DT 66) and were requested by NPS to preserve some the facility's historical value and increase its compatibility with its forested environment (City of Seattle 1969:27-28). A photo of the 1969 powerhouse in 1970 is shown in **Figure 19**.

The powerhouse is a one-and-a-half story, wood-framed building with a rectangular plan and moderately pitched side-gable roof that angles outward from its eaves to its peak on the east and west sides (**Figure 20**). The building's roof is clad in standing-seam metal and has wide overhangs with boxed eaves. Decorative trapezoidal rafter tails extend out beyond the roof's overhang on its north and south sides. The exterior of the powerhouse is clad in vertical board-and-batten siding. The north and south facades of the building are divided into eight bays by nine regularly spaced embedded wood columns, and its east and west facades are divided into two bays by three regularly spaced embedded wood columns.

The north façade features three large rectangular wood fixed single pane windows, located in the second, fourth, and sixth easternmost bays. A single-leaf access door is in the westernmost bay near the building's northwest corner with a small light fixture affixed above. Additionally, metal interpretive signage is affixed to the windowsills and to the exterior of the façade's easternmost bay, and an electronic security pad and a small metal City Light building identifier sign are affixed to the exterior adjacent to the access door. Features of the east façade include two rectangular fixed wood vent windows with fixed wood awnings beneath the gable peak, two projecting vent fans on the façade's southern bay, and a small light fixture near the center of the façade. The west façade's primary feature is a large double-leafed door in the façade's northern bay, clad in vertical board and batten matching the rest of the building's exterior. A rectangular fixed wood vent window and fixed awning matching the two on the east façade are in the façade's southern bay beneath the gable peak. The south façade features a single-leaf access door in the easternmost bay near the building's southeast corner with a light fixture matching the fixture on the north façade affixed above. The bifurcated penstock enters the building near the center of the base of the south façade. Other features of the south façade include several mechanical equipment boxes and meters and a separate metal hazard storage unit just off the building's south side adjacent west of the access door.

Figure 19. 1969 NCPDC powerhouse in 1970, facing southeast

Source: City Light 1970b.

Figure 20. 1969 NCPDC powerhouse in 2022, facing southwest

ICF 2022

The powerhouse's interior consisted largely of a single open room, with a cluster of four small rooms located along its eastern exterior wall that housed a station battery room, storage area, bathroom, and office. Its interior walls were clad in vertical board. The powerhouse's generating equipment was located centrally within the open room, with the bifurcated penstock entering the building through its southern exterior wall to service its pair of PWWC turbines, between which was the Westinghouse generator. Associated generating equipment was located centrally along its western and northern walls, including the switchgear cubicles and exciter cabinets and an air compressor, hydraulic control panel, and auto transfer switch, respectively. (City Light 1969h: Electrical World 1922:139) These associated components were contemporaneous units, which replaced those installed in 1921 (City Light, 1968e:27). However, the location and layout of the 1969 powerhouse's engineered components appear to be the same as in the 1921 building, including the primary generating equipment and discharge chutes beneath the northern half of the building (City Light 1919a, 1969h).

The powerhouse has been altered since 1969 to facilitate access in its immediate vicinity and support its auxiliary function as an interpretive site within the RLNRA. Its most substantial alterations include the expansion of its north façade window openings and the installation of windows of a different design from the 1969 design, the replacement of its wood-shingled roof cladding with standing-seam metal, and the alterations to discharge chutes and wood deck adjacent to the building's north elevation. The powerhouse's windows were enlarged between 1990 and 2010 to provide expanded views of its original generating equipment, supplemented by interpretive signage affixed to the building (Erigero 1990: Photo 62; Johnson 2010: File No. 4234). The building's original hand-split cedar-shake roof cladding was also replaced with standing-seam metal during this period. (Erigero 1990: Photo 62; Johnson 2010:File No. 4234). The timber flume extensions to the powerhouse's discharge chutes were first modified between 1969 and 1990, when metal grates were installed over each flume's lumber supports, and metal slide gates were installed at the end of each flume to control water flows out of the powerhouse. (City Light 1969h; Erigero 1990: Photo 62). In 2000, the wood deck on the north side of the powerhouse that spanned the discharge chutes was removed, the flumes were replaced with an enclosed concrete structure matching the flumes in configuration and dimensions, and the area above was enclosed, filled, and capped with concrete (City Light 2000c). The fencing around the new edge of the tailrace adjacent to the powerhouse was replaced (City Light 2000c). The alterations made to the powerhouse's windows and discharge chutes during this period were the outcome of recommendations for new interpretive exhibits at the powerhouse made in City Light's 1998 *Historic Resources Mitigation and Management Plan* related to the NCHP's licensing in 1997 (City Light 1998a:26-27). Fixed-wood awnings were installed between 2010 and fall 2022 over the gabled-peak vent windows on the powerhouse's east and west facades, and minor features have been added over time, including an exterior mechanical equipment box (c. 1987–1990)—clad in matching-board-and-batten siding—an electronic security pad (c. 2010–2022), identification signage (c. 2010–2022), and exterior light fixtures on the north façade (c. 1970–1987), south and east facades (c. 2010–2022) (NPS 1987; Erigero 1990: Photo 62; Johnson 2010: File No. 4234). The powerhouse is in good condition.

5.2.1.2 Historic Significance

NRHP Criterion A

The powerhouse is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its association with the redevelopment of the NCHP from 1967–1970, which ensured the continued

operation of the NCHP for local power production for the town of Newhalem and as station service power backup for the Gorge Powerhouse (Johnson 2010:46). Due to a fire in 1966, it was necessary to reconstruct the powerhouse to continue operation of the NCHP; the headworks was also redeveloped during this period (Johnson 2010:8-5). The 1969 rustic design, a 1975 American Public Power Association honor award recipient, drew heavily from the 1920's vernacular powerhouse design through the adherence to the majority of the original footprint, the scale and massing, the application of similar building materials (wood), siding (board-and-batten) and the reuse of the original 1920s turbines and generator. The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5). In addition to serving as backup for the Gorge Powerhouse, the NCHP was the oldest operating hydroelectric plant within the SRNCHP (DT 66) until it ceased operations in 2010 (Johnson 2010:8-54). The powerhouse was partially automated in the early 1950s and was the first City Light facility within the SRNCHP (DT 66) to undergo full automation, with remote control of the facility fully transferred to the Gorge Powerhouse in the early 1970s (Johnson 2010:8-46).

Given its historic associations with the initial hydroelectric development and design, and continued operation of the NCHP and the SRHP after the fire, which incorporated the original interior layout and machinery dating to the 1920s, the powerhouse is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66) historic district. However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and SRNCHP (DT 66).

NRHP Criterion B

The powerhouse is not associated with any individuals that played a significant role in national, regional, or local history within the NCHP or the SRHP. At the time of the powerhouse's construction, City Light was led by Superintendent John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines within the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. Furthermore, research provided no indication that any other individuals potentially associated with the property played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2020). As such, the powerhouse is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

NRHP Criterion C

Architecturally, the powerhouse was designed by City Light, with the design attributed to City Light civil engineer William L. Freitas and constructed by the W.H. Gregory Company. Freitas' 1969 design was meant to evoke the rustic design of the original 1921 powerhouse, exhibited through elements, such as the building's single-story, rectangular, side-gabled form, similar footprint and orientation at the site, cedar board-and-batten siding, hand-split cedar-shake roof, exposed rafter ends, and fixed wood windows (City Light 1971c:11). While the powerhouse has been altered to expand its capacity as an interpretive subject and further protect the building and the 1921 power generation

equipment, it retains sufficient integrity to convey its significance as an example of rustic architectural design adapted to a hydroelectric powerhouse. Additionally, though this particular design was recognized for its architectural and engineering merit, Freitas is not considered a master architect based on thresholds established by National Register Bulletin 15 (*Seattle Times* 1975:37; NPS 1995:20). The powerhouse is, thus, found to be a district contributor in architecture to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the powerhouse is not considered to be individually significant in architecture under Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

In addition to the building's architectural design, the powerhouse's engineering design was considered for potential significance. The powerhouse retains the NCPDC's original generating equipment—two PWWC double-nozzle impulse-type waterwheels and Westinghouse generator from 1921—and City Light construction drawings from 1921 and 1969 suggest the layout and location of this equipment and discharge chutes remained the same. The powerhouse, in reusing the 1921 PWWC turbines and Westinghouse generator, continued to function for what it was originally designed for—the generation of power within the NCHP and the SRHP for the construction of GPDC and providing power to the construction camp and the town of Newhalem. The powerhouse represents a critical component of the NCPDC's engineering infrastructure that ensured the NCHP's continued use and is, thus, considered an example of significant engineering from an early hydroelectric era that was determined still relevant when the 1969 reconstruction of the powerhouse took place to merit reuse. The powerhouse is, thus, found to be a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the powerhouse is not considered to be individually significant in engineering under Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

NRHP Criterion D

The powerhouse is a common example of its architectural and engineering types that provides no important information about the general trends of hydroelectric powerhouse construction or design, or hydroelectric power generation that occurred in Washington during the 1960s and 1970s that cannot be obtained through documentary sources. Therefore, the powerhouse has not yielded and is not likely to yield information important in prehistory or history. For this reason, the powerhouse cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Evaluation of Integrity

Integrity is defined as the ability of a property to convey historic significance. The NRHP criteria recognizes seven aspects or qualities that, in various combinations, define integrity. Those seven aspects are location, setting, design, materials, workmanship, feeling, and association (NPS 1995:44). Each aspect is applied below.

- **Location**. The powerhouse retains integrity of location. The building was constructed on the site of the 1921 powerhouse and has remained in its original location since 1969.
- **Setting**. The powerhouse retains integrity of setting. The building's setting in the RLNRA remains largely unchanged since the period of its construction (1921 and 1969). The building remains isolated in a heavily forested area at the base of the hillside on the south side of the

Skagit River with the penstock extending uphill behind the powerhouse. It also retains some of its circa 1973 small-scale landscaping features, including several of the 1973 light posts and fixtures and the adjacent retaining wall, which appears intact and is substantially covered by vegetation. The powerhouse is within a discrete grouping of hydroelectric components separate from the SRHP. Alterations have been made to the immediate area over the years, among them the installation of fencing in the vicinity of the powerhouse, improvements to the surrounding trail system, and the addition of small-scale features, such as interpretive trail signage. However, these changes have had a limited impact on the powerhouse's setting.

- **Design**. The powerhouse's integrity of design has been affected architecturally over the years, and to a limited extent, its engineering. Architecturally, the powerhouse has had the following changes: all three of the north façade window openings were enlarged from square to rectangular openings, which included the replacement of the original windows, but which remained in the same location on the building's facade; the installation of interpretive signage to the replacement windows' sills and to the building's exterior; the replacement of its wood-shingle roof with dark tan standing-seam metal roof; and the addition of small fixed-wood awnings over the east and west façade's wood-slat vent openings. Other minor alterations included the installation of an electronic security pad by the doorway and signage on the north façade, and exterior light fixtures on the eastern and southern façades. Although the roofing material has changed from the 1969 design, the majority of the roof design (e.g., shape, size, scale, orientation, and pitch) has remained the same. The overall form, scale, size, plan, and massing of the powerhouse has not changed since the 1969 design.

  With respect to its engineering integrity, it has been affected by alterations to the timber extensions of its discharge chutes when they were replaced with concrete. However, their placement, general dimensions, and function remain the same. The powerhouse continues to retain the 1921 powerhouse's power generating equipment, reused in the 1969 powerhouse after its construction, and which have remained in the same configuration in both the 1921 and 1969 powerhouse. Overall, even with the noted alterations, the powerhouse maintains sufficient integrity to still convey its original function and the rustic design intent of the 1969 design.

- **Materials**. The powerhouse's integrity of materials used for the architectural design has been affected over the years and include the following changes: the 1969 cedar-shake cladding roof has been replaced of the with dark tan standing-seam metal panels; the powerhouse's north façade windows have been replaced and enlarged; the two timber frames and cladding of the two discharge chutes has been removed and replaced with chutes enclosed in a larger concrete structure; and on multiple elevations, the plastics, vinyl, metals, wood composites, and electronics associated with the more recently installed interpretive signage, electronic security pad, identification signage, electrical conduit, and exterior light fixtures. The building retains its original timber structural framework and board-and-batten exterior cladding. Although the replacement roof cladding is the same material type (metal) that was used in the 1921 powerhouse (corrugated metal), the visual texture/pattern appearance of standing-seam metal is different than the corrugated metal sheets employed in the 1921 construction and, thus, does not fully align with the Freitas' design intent to evoke the 1921 building. However, the low profile of the replacement material and its darker color are in keeping with the 1969 rustic design intent. Regarding the engineering components, the powerhouse retains materials in its most important engineered components, its Westinghouse generator and PWWC turbines. The integrity of materials for the visible portions of its discharge chutes has been affected as noted previously. Despite the change in roof cladding, alterations to the north façade windows, and

concrete enclosure of the chutes, the building overall continues to convey the majority of the materials used in the 1969 design.

- **Workmanship.** The powerhouse's integrity of workmanship has been affected by its alterations. Workmanship is reflected in its retained structural materials, exterior cladding, and the retention and its engineered components and the maintenance of their configuration in the powerhouse. However, the loss of its hand-split cedar-shake roof and original windows has removed two features exemplifying the craftsmanship of the building's construction.
- **Feeling**. The powerhouse's integrity of feeling has been slightly affected by alterations to its architectural and engineered features. Although alterations to its roof, windows, and the discharge chutes have changed the appearance of the structure, the overall architectural aesthetic of a 1969 rustic-inspired design in a forested environment is still present. The building's form, footprint, layout, visual cues and audible environment (e.g., flow of water, natural noises heard in a forested environment), and circulation pathways around it traversing through and within a forested environment remain relatively unchanged. Its key engineered components—the 1921 generating equipment and obscured portions of the discharge chutes—remain largely intact. Overall, the property remains generally recognizable to its 1969 construction period.
- **Association**. The powerhouse has remained in the place where its history unfolded—first, the site of the 1921 powerhouse built as part of the NCHP that supplied power for the construction of the GPDC and the growing workcamps that eventually became the town of Newhalem, then through the destructive fire in 1966 and the reuse of the original 1921 generating equipment within the reconstructed 1969 powerhouse, to its final year of operation in 2010. The addition of interpretive elements over the last two decades further communicates its historic associations with the SRNCHP (DT 66) and City Light. It continues to retain integrity of association with the NCPDC and SRNCHP (DT 66).

Overall, the powerhouse meets the majority of the seven aspects of integrity. It retains integrity in location, setting, feeling, and association as noted previously. While alterations have affected its integrity of design, materials, and workmanship, the powerhouse retains sufficient overall integrity to convey its significance under Criteria A and C as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendations

Eligibility as a District Contributor to the SRNCHP (DT 66)

The powerhouse is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as a support facility for the Gorge Powerhouse. The reconstruction of the powerhouse and headworks redevelopment following the 1966 fire represented City Light's commitment to the continued operation of the NCHP, with power production resuming in 1970. Until it ceased production in 2010, the NCHP was the oldest operating hydroelectric facility in the Skagit River area, and the first to undergo full automation. The powerhouse retains integrity to convey this significance under Criterion A during the 1969–1970 period, the date of the property's completion to the year the redeveloped NCHP began producing power.

The powerhouse is not recommended as a contributor to the SRNCHP (DT 66) under Criterion B. The district is listed in the NRHP under Criterion B for its significant association with J.D. Ross, the Superintendent of City Light from 1911–1939 who was involved substantially in the planning and construction of the SRHP and NCHP. As the powerhouse was constructed well after 1939, the property does not share this association with Ross.

The powerhouse is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion C as an example of rustic architecture adapted to a hydroelectric powerhouse and as one component of the cohesive and intact collection of engineered components that comprise the NCPDC. Freitas' 1969 design evoked the rustic design of the 1921 powerhouse, exemplified by its overall form, plan, and orientation at the site and the use of wood in its structural materials, exterior cladding, original roof material, and decorative elements. The necessary and substantial improvements made in 1969 to the original engineering of the NCPDC, including the reconstruction of the powerhouse, ensured the facilities continued operation and secured an increased and better regulated source of water for hydroelectric production. The powerhouse retains integrity to convey its architectural and engineering significance under Criterion C as part of the redevelopment of NCHP in 1969.

Individual NRHP Eligibility

The powerhouse is significant under Criterion A and retains integrity to convey this significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the powerhouse alone. Thus, in the absence of individual significance, regardless of physical condition, the powerhouse cannot be considered to have integrity that conveys individual significance under Criterion A. As such, the powerhouse is recommended not eligible for individual listing in the NRHP under Criterion A.

The powerhouse is significant under Criterion C and retains integrity to convey this significance, as discussed previously. However, the significance of its architecture and engineering is derived from its context within the redeveloped NCHP's design and function in 1969 that cannot be represented solely by the powerhouse. Thus, in the absence of individual significance, regardless of physical condition, the powerhouse cannot be considered to have integrity that conveys individual significance under Criterion C. As such, the powerhouse is recommended not eligible for individual listing in the NRHP under Criterion C.

Without meaningful connection to an individual important to history, and unable to yield information important to prehistory or history, the powerhouse cannot be considered to have individual significance under Criteria B or D. Thus, in the absence of individual significance, regardless of physical condition, the powerhouse cannot be considered to have integrity that conveys individual significance under Criteria B or D. As such, the powerhouse is recommended not eligible for individual listing in the NRHP under Criteria B or D.

5.2.2 Headworks (Map ID 2)

5.2.2.1 Description

The headworks is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA along the banks of Newhalem Creek. Construction of the headworks was completed in 1969 based on a design by City Light, though available documentation does not specify the engineer or contractor responsible for its construction (Johnson 2010:7-44–7-45).

The headworks consists of a diversion dam and apron, sluice way/channel, intake and rock shaft, gatehouse, associated concrete slabs around the gatehouse, and footbridge (**Figure 21**). Viewing the eastern bank from the western bank of Newhalem Creek, the headworks is tiered onto the eastern bank and covers a larger area than the 1921 design. The headworks' footbridge crosses from the western bank over the creek to the eastern bank, just downstream (north) of the dam. A short gravel pathway leads from the footbridge to the existing gatehouse, which is situated a few feet above a lower concrete platform adjacent to the east edge of the sluice way/channel. The gatehouse sits atop the intake and rock shaft, which are enclosed beneath the eastern bank concrete slab and gatehouse. From the gatehouse, a narrow concrete stairway provides access to the lower concrete level. A 2-foot concrete retaining wall is north of the concrete steps, and south is the concrete foundation for the gatehouse, slightly inset into the sloped eastern bank. The intake's trash rack, consisting of metal grates, is visible along the eastern wall of the sluice way/channel. This sluice way/channel is situated between the intake and the dam. Lastly, the dam and apron extend east–west across the creek with the dam's foundation imbedded into the western bank of the creek.

The concrete diversion dam is 9 feet high, 47 feet wide, and 4.5 feet thick with three metal nappe splitters on the northernmost side of its crest. The dam's downstream (north) concrete apron is flat and conical in shape, with a generally rectangular extension off its northern edge along the eastern bank of Newhalem Creek. The flat conical portion of the concrete apron is surface reinforced by a similarly shaped steel plate covering two-thirds of the apron. Structural repairs were made to the dam and apron in 1984 to manage bedload abrasion (deterioration of the dam's concrete materials from flowing sediment in the creek), with each receiving a layer of grouting that included galvanized pipe welded to the original imbedded concrete support pipes on the apron (City Light 1984). Based on photographic documentation of the headworks completed in 1987, two of the three metal-nappe splitters on the dam were lost or removed between 1984 and 1987 (City Light 1984; NPS 1987). The extant steel plates were installed on the apron in 1998 to replace a scoured concrete patch installed in 1993 (City Light 1998b).

The sluice way is a predominantly concrete and mostly rectangular shaped channel measuring approximately 36 feet long and 5 feet wide. Located between the gatehouse and the east side of the diversion dam, it is used to divert water from Newhalem Creek (upstream) into the intake, back into the creek or onto the apron below the diversion dam (downstream). The channel's west wall abuts the dam at its north end, where the wall is wider than the south end. There are two rectangular openings (for water flow) toward the south end. Though timber bulkheads were originally slotted into these openings on the sluice channel's west side upstream of the dam, only the northern bulkhead remains intact. The channel's east wall is slightly sloped and appears to be integrated into the gatehouse's concrete foundation and platform which functions as a trash rack for the intake below the gatehouse and within the concrete slab. The trash rack is steel with vertical thin bars. A hoist gate is at the north end of the channel that can be used to divert water west onto the dam apron, or a gate can be fitted in place on the west wall to divert water north directly into the creek channel. Currently, a corrugated metal panel has been slotted into the opening on the north end of the channel to divert water onto the apron. Alterations to the sluice way include the removal of the timber bulkhead slotted into the southern of the two openings on the south side of the sluice channel upstream from the dam, the removal of the timber weir slotted into an opening on the south side of the sluice way downstream of the dam, and the addition of a corrugated metal panel slotted into the sluice channel gate opening on the east side of the gate structure. These alterations to the sluice channel occurred between 1987 and 2010 (NPS 1987; Johnson 2010:File #4242).

Figure 21. 1969 NCPDC headworks, facing north

ICF 2022

The intake and rock shaft, due to their subterranean nature, could not be documented, and the condition of both components is unknown. Based on available documentation including City Light construction documents and existing historic resources documentation, the intake and rock shaft have not been altered since 1969.

The current gatehouse was built in 1986, replacing a temporary structure built in 1981 after a flood destroyed the 1969 gatehouse in 1980 (City Light 1981a, 1981b, 1986). The gatehouse is situated above the intake on a concrete slab on the east side of the headworks. The gatehouse is a small, square, off-center, gabled-roofed structure with rough board-and-batten cedar and fir cladding. The gatehouse's roof is clad in standing-seam metal panels and has wide overhangs. Decorative wood trapezoidal rafter tails matching those of the powerhouse, though smaller in scale, extend out beyond the roof's overhang on its south and north sides. The northeastern corner of the gatehouse is devoted to a storage area covered by the roofline and enclosed with three-quarter-height walls and a three-quarter-height gate. The building's southern two-thirds are fully enclosed, with an inset access door inset beneath its roofline at its southwest corner. A pair of wood vent windows are near the base of the gatehouse's eastern façade near its northeastern corner.

Two concrete slabs are tiered along the eastern bank of Newhalem Creek, enclosing the intake and rock shaft and serving as the gatehouse foundation and eastern wall of the sluice channel. The upper slab curves from the eastern side of the footbridge to the gatehouse and is topped with an open metal railing. Alterations to the concrete slabs include the removal of the 1969 rock retaining wall north of the concrete stair, the addition of metal handrails on the stair, the replacement of a wood post and rail fence around the upper concrete slab with the metal rail between 1970 and 1987, and the removal of the pole and chain fencing around the lower concrete slab between 1987 and 2010 (City Light 1971b; NPS 1987; Johnson 2010:File #4242).

A steel footbridge crosses Newhalem Creek downstream above the dam apron from the western side of the headworks to the upper concrete slab on the eastern bank north of the gatehouse. The bridge's eastern concrete abutment is exposed on the eastern bank of Newhalem Creek, while the western abutment is embedded in the western bank. In 2011, this bridge replaced the pre-1969 log bridge that was retained during the redevelopment of the headworks (City Light 2011).

The aboveground components of the headworks are in fair condition.

5.2.2.2 Historic Significance

NRHP Criterion A

The headworks is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its association with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as station service power backup for the Gorge Powerhouse (Johnson 2010:46). Due to a fire in 1966, it was necessary to rebuild the powerhouse to continue operation of the NCHP (Johnson 2010:8-5). The headworks was redeveloped as well from 1967–1969, with the current dam replacing the 1921 wood crib dam and intake structure at the site. The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5).

Given its significant historic associations with the initial hydroelectric development, design, and continued operations of the NCHP and the SRHP, the headworks is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66). However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and SRNCHP (DT 66).

NRHP Criterion B

The headworks is not associated with any individuals that played a significant role in national, regional, or local history. At the time of the headworks' construction, City Light was led by John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines within the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. Furthermore, research provided no indication that any other individuals potentially associated with the property played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2020). As such, the headworks is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

NRHP Criterion C

The headworks was designed by City Light; however, available documentation does not specify the engineer or contractor responsible for its construction. Though a predominantly intact and integral engineering component of the NHCP and its operation, the design, and materials of the headworks—

primarily the concrete diversion dam, sluice channel, and intake components—were common as early as the 1920s as a method of diverting water into conveyance infrastructure for the purposes of offsite hydroelectric generation (Soderberg 1988a:F-5–F-6). Its related components, the gatehouse and footbridge, also represented common architectural and engineering designs and methods of construction for the 1960s.

When considered within the historic context of the NCHP's redevelopment during this period, the rebuilt headworks represents a technologically necessary and substantial improvement on the 1921 NCPDC infrastructure at this site, which ensured the NCHP's continued operation and secured an increased and improved regulated source of water for hydroelectric production. Thus, the headworks is considered significant as a contributor to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the headworks is not considered to be individually significant in engineering under NRHP Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

NRHP Criterion D

The headworks is a common example of its engineering type that provides no important information about the general trends of hydroelectric generation dam and intake construction or design that occurred in Washington during the 1960s and 1970s that cannot be obtained through documentary sources. Therefore, the headworks has not yielded and is not likely to yield information important in prehistory or history. For this reason, the headworks cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Evaluation of Integrity

Each aspect of integrity is evaluated below.

- **Location.** The headworks retains integrity of location. The structure has remained in its original location since 1969.
- **Setting.** The headworks retains integrity of setting. The headworks' setting on Newhalem Creek remains remote, mountainous, and heavily forested since the period of its construction and no new developments associated with the RLNRA have been introduced in its vicinity.
- **Design.** The headworks retains integrity of design. Alterations to its primary engineered components were limited to necessary maintenance activities to its diversion dam and apron. Though visible, these alterations are obscured by the water flow of Newhalem Creek and not changes to the design of these engineered features. Alterations to related features include the reconstruction of the gatehouse, replacement of railings along the concrete slabs, and the replacement of the footbridge (log to steel). While the above alterations somewhat diminish the 1969 design of the headworks, they are better understood as changes in materials than design.
- **Materials.** The headworks retains integrity of materials from the 1969 design and remains mostly intact. Concrete was the primary material used for the headworks and is currently seen in the diversion dam and apron, the tiered walls, platforms and associated stairs, foundations for the gatehouse and the footbridge, and the sluice way. Wood is another of the primary materials used at the site but concentrated in the gatehouse's board-and-batten siding and its structural framework and the footbridge's structural framework. Lastly, metal is also used, mainly seen on the gatehouse in the form of a standing-seam metal roof cladding, then as handrails along the

tiered platforms, the metal grating panels used on the footbridge deck, on the sluiceway, and in the reinforced apron. Impacts on these materials over time resulted from alterations to the headworks' related features and/or the loss or removal of small-scale components of primary engineered features. They include the reconstruction of the gatehouse, the replacement of wood and post fencing with metal railings, and the replacement of the log footbridge with a steel footbridge. Other related features that have been removed or lost include the pole and chain railing along the lower concrete slab, the nappe splitters along the diversion dam, and a timber bulkhead and timber weir that formerly occupied openings in the sluice channel. Features that have been added include the corrugated metal panel now slotted into the hoist gate at the sluice channels west end.

- **Workmanship.** The headworks retains integrity of workmanship. Though the overall workmanship of the headworks has been slightly diminished by the loss of some historic materials and alterations to related features, such as the gatehouse and concrete slab railings, the workmanship of the headworks primary engineered features remains largely intact. Features, such as the diversion dam and apron and intake structure demonstrate the construction methods used in 1969, including the transportation wood and concrete materials and heavy machinery for site excavation to the headworks site via Dam Access Road, and the use of cofferdams to alter the flow of Newhalem Creek during construction (City Light 1969i).
- **Feeling.** The headworks retains integrity of feeling. The structure remains intact along the banks of Newhalem Creek and within the larger forested and steep terrain environment, despite the aforementioned individual alterations and lost materials. While its footbridge has been replaced, and small-scale features such as the original handrails have been replaced or removed, the headworks as a whole is still recognizable as a late 1960s headworks associated with a hydroelectric facility.
- **Association.** The property retains integrity of association. The headworks has remained in the place where its history unfolded—first, the site of the 1921 headworks built as part of the NCPDC to supply water to the powerhouse for the generation of power, then redeveloped in 1967–1969 into a more efficient design to continue supplying water to the powerhouse, and its continued function as the primary component to divert water from Newhalem Creek to the powerhouse until 2010.

Overall, the headworks meets the majority of the seven aspects of integrity. It retains integrity in location, setting, design, workmanship, feeling, and association. While alterations to its related features have affected its integrity in materials, the headworks retains sufficient overall integrity to convey its significance under Criteria A and C as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendations

Eligibility as a District Contributor to the SRNCHP (DT 66)

The headworks is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as a support facility for the Gorge Powerhouse. The reconstruction of the powerhouse and headworks redevelopment following the 1966 fire represented City Light's commitment to the continued operation of the NCHP, with power production resuming in 1970. Until it ceased production in 2010,

the NCHP was the oldest operating hydroelectric facility in the Skagit River area. The headworks retains integrity to convey this significance under Criterion A during the 1969–1970 period, the date of the property's completion to the year the redeveloped NCHP began producing power.

The headworks is not recommended as a contributor to the SRNCHP (DT 66) under Criterion B. The district is listed in the NRHP under Criterion B for its significant association with J.D. Ross, Superintendent of City Light from 1911–1939 who was involved substantially in the planning and construction of the SRHP and NCHP. As the headworks was constructed well after 1939, the property does not share this association with J. D. Ross.

The headworks is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion C as one component of the cohesive and intact collection of engineered components that comprise the NCPDC. The necessary and substantial improvements made in 1969 to the original engineering of the NCPDC, including the redevelopment of the headworks, ensured the facilities continued operation and secured an increased and better regulated source of water for hydroelectric production. The headworks retains integrity to convey its engineering significance under Criterion C as part of the redeveloped NCHP in 1969.

Individual NRHP Eligibility

The headworks is significant under Criterion A and retains integrity to convey this significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the headworks alone. Thus, in the absence of individual significance, regardless of physical condition, the headworks cannot be considered to have integrity that conveys individual significance under Criterion A. As such, the headworks is recommended not eligible for individual listing in the NRHP under Criterion A.

The headworks is significant under Criterion C and retains integrity to convey this significance, as discussed previously. However, the significance of its engineering is derived from its context within the redeveloped NCHP's design and function in 1969 that cannot be represented solely by the headworks. Thus, in the absence of individual significance, regardless of physical condition, the headworks cannot be considered to have integrity that conveys individual significance under Criterion C. As such, the headworks is recommended not eligible for individual listing in the NRHP under Criterion C.

Without meaningful connection to an individual important to history, and unable to yield information important to prehistory or history, the headworks cannot be considered to have individual significance under Criteria B or D. Thus, in the absence of individual significance, regardless of physical condition, the headworks cannot be considered to have integrity that conveys individual significance under Criteria B or D. As such, the headworks is recommended not eligible for individual listing in the NRHP under Criteria B or D.

5.2.3 Power Tunnel (Map ID 3)

5.2.3.1 Description

The power tunnel is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA. The power tunnel was constructed in 1921 based on a design by City Light, though available documentation does not specify the engineer or contractor responsible for its construction (Johnson 2010:7-44–7-45; Allen 1921:401).

The power tunnel consists of a 2,452-foot unlined rock tunnel, measuring approximately 6 feet by 7 feet with an 8.6-percent grade (City Light 1920; 2022c:1-1). A concrete plug is constructed 218 feet from the tunnel's northern terminus that forces water into the penstock (see **Figure 14** and **Figure 22**) (City Light 1920). The tunnel has a straight north-northwest alignment and is bored through the surrounding bedrock, from the rock shaft at the headwork's intake to its northern terminus. The power tunnel is not lined with any materials.

The only documented alteration to the power tunnel is the installation in 1986 of a 6-inch flange drainpipe supported by wood posts that ran above the penstock within the tunnel from the concrete plug to outside the tunnel's northern terminus (City Light 1987b). Due to its subterranean nature, the current condition of the power tunnel could not be documented. The northern terminus is visible, though vegetation is encroaching the tunnel entrance in the open rock face.

5.2.3.2 Historic Significance

NRHP Criterion A

The power tunnel is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its association with the 1918–1921 development of the NCHP for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem. It is also significant with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and station service power backup for the Gorge Powerhouse (Johnson 2010:8-46). The power tunnel is one of three extant components of the NCPDC from 1921, the others being the penstock and tailrace.[4] Due to the fire in 1966, it was necessary to reconstruct the powerhouse to continue the operation of the NCHP; the headworks was also redeveloped during this period (Johnson 2010:8-5). The power tunnel was retained and continued to function as a water conveyance component of the redeveloped NCHP (Johnson 2010:8-5). The reconstructed powerhouse began producing power again in 1970, and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5). Given its significant historic associations with the initial hydroelectric development, design, and continued operations of the NCHP and the SRHP, the power tunnel is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66). However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and SRNCHP (DT 66).

[4] The powerhouse's generating equipment, two PWWC double-nozzle impulse-type waterwheels and Westinghouse generator, are better understood as features of the powerhouse, rather than as components of the NCPDC. This approach is consistent with the treatment of generating equipment in the SRNCHP (DT 66) NRHP listing, which did not identify and evaluate the generating equipment of the Gorge, Diablo, or Ross powerhouses as contributing resources separate from the powerhouses to those facilities' respective historic areas.

Figure 22. NCPDC power tunnel plug in 1968, facing north

Source: City Light 1968d.

NRHP Criterion B

The power tunnel is significant under Criterion B for its associations with J.D. Ross, a person of regional and national significance for his 28-year tenure as Superintendent of City Light over the agency's first three decades, during which he was involved substantially in the planning and construction of the NCHP and SRHP. He was also associated with promoting hydroelectric power in the region and nationally (Johnson 2010:8-50–8-51, 8-62–8-63). However, the power tunnel's association with Ross is linked directly with the development of the NCHP in its entirety and cannot be represented by the power tunnel alone. As such, the power tunnel is not considered individually significant under NRHP Criterion B. When considered within the context of the NCHP's development and its significant association with Ross from 1918–1939, the power tunnel is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66) under Criterion B.

At the time of the NCHP's redevelopment, City Light was led by Superintendent John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines within the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. As such, the headworks is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

NRHP Criterion C

The power tunnel was designed by City Light and constructed in 1921; however, available documentation does not specify the engineer or contractor responsible for its construction. The power tunnel's design, a straight and narrow alignment along a moderate grade, and method of construction, horizontal boring using compressed air and Leyner Drills, were quite common for tunnel construction by 1921 (MacRae 2012). Furthermore, the use of power tunnels in lieu of aboveground water conveyance structures was becoming more common for hydroelectric developments by this time (Soderberg 1988a:F-5). The power tunnel's design is simple and required no innovative construction methods, as it is bored directly though the bedrock of the adjacent mountain without the application of any additional lining. Comparatively, the GPDC power tunnel is significant for its engineering and construction, including the innovative horseshoe-shape design of the tunnel and its associated surge tank, and for the specific type of nozzle developed by City Light to facilitate the construction of its concrete lining (Johnson 2010:8-54).

When considered within the context of the NCPDC's design, the power tunnel's engineering and design is considered significant. The 1921 NCPDC design is a significant example of an early 20th century hydroelectric facility constructed for the purpose of supplying power to a construction work camp associated with larger hydroelectric projects in its vicinity. Due to the mountainous nature of its setting and the distance between the site of the headworks on Newhalem Creek and the powerhouse near the Skagit River, the power tunnel was a necessary and integral engineered component of the NCPDC's water conveyance system for power production. It continued to function as such in the redeveloped NCHP. The power tunnel retains integrity to convey the significance of this system. The power tunnel is, thus, found to be a district contributor in engineering to the NCPDC

and the SRNCHP (DT 66) under Criterion C. However, the power tunnel is not considered to be individually significant in engineering under NRHP Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

NRHP Criterion D

The power tunnel is a common example of its engineering type that provides no important information about the general trends of hydroelectric generation facility construction or design, or hydroelectric power generation that occurred in Washington during the 1910s and 1920s that cannot be obtained through documentary sources. Therefore, the power tunnel has not yielded and is not likely to yield information important in prehistory or history. For this reason, the power tunnel cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Evaluation of Integrity

Each aspect of integrity is evaluated below.

- **Location**. The power tunnel retains integrity of location. The structure remains in its original location and its alignment has not changed since it was built in 1921.
- **Setting.** The power tunnel retains integrity of setting. Due to its subterranean nature, the aspect of setting is less significant for this property. However, the setting of the tunnel's northern terminus, the single aboveground feature of the property, remains a remote and heavily forested hillside.
- **Design.** The power tunnel retains integrity of design. The power tunnel's alignment and dimensions have not changed since it was built in 1921. The drainpipe introduced into the rock tunnel along the penstock in 1987 is a minor alteration and does not detract from the power tunnel's integrity of design.
- **Materials**. The power tunnel retains integrity of materials. The aspect of materials is less applicable to the power tunnel, because the power tunnel was bored directly through the bedrock of the hillside and not lined with any other materials. The drainpipe introduced into the rock tunnel along the penstock in 1987 is a minimal alteration and does not detract from the power tunnel's integrity of materials.
- **Workmanship**. The power tunnel retains integrity of workmanship. The retention of its bare rock walls demonstrates the intensive construction methods used by boring crews in the early 1920s.
- **Feeling**. The power tunnel retains integrity of feeling. Due to its subterranean nature, the property is only minimally visible at its northern terminus.
- **Association**. The power tunnel retains integrity of association. It has remained in the place where its history unfolded—a forested, mountainous environment on the banks of Newhalem Creek where it was built in 1921 as part of the NCPDC to supply water from the headworks to the powerhouse for the generation of power, and then reused in the 1969 redevelopment of the NCHP to continue supplying water to the powerhouse until 2010.

Overall, the power tunnel retains integrity in all seven aspects. Thus, it retains overall integrity to convey its significance under Criteria A, B, and C as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendations

Eligibility as a District Contributor to the SRNCHP (DT 66)

The power tunnel is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the development of the NCHP from 1918–1921 for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem, and with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as a support facility for the Gorge Powerhouse. The reconstruction of the powerhouse and headworks redevelopment following the 1966 fire represents City Light's commitment to the facility's continued operation, with power production resuming in 1970. Until it ceased production in 2010, the NCHP was the oldest operating hydroelectric facility in the Skagit River area. The power tunnel retains integrity to convey this significance under Criterion A during the entire 1918–1970 period, representing both the NCHP's original development from 1918–1921, as well as its redevelopment in 1967–1970 and continued operation thereafter.

The power tunnel is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion B, for its significant association with J.D. Ross, the Superintendent of City Light during the period of the NCPDC's original construction. He was involved substantially in the planning and construction of the SRHP and NCHP. The power tunnel's significance under Criterion B is limited to the 1918–1939 period, beginning with the start of planning and construction of the NCHP and ending at the end of Ross's tenure as Superintendent of City Light. As an intact original component of the NCPDC, the power tunnel retains integrity to convey its significant association with Ross.

The power tunnel is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion C as one component of the cohesive collection of engineered components that comprise the NCPDC. As an original component, the power tunnel represents the NCPDC's 1921 design and construction and the necessary and substantial improvements made in 1969 to the original engineering of the NCPDC, including the reconstruction of the powerhouse, which ensured its continued operation and secured an increased and improved regulated source of water for hydroelectric production. As a functional and integral component of the NCPDC, City Light determined that the 1921 power tunnel still had relevancy in 1969 and integrated it into the redeveloped system. The power tunnel retains integrity to convey its engineering significance under Criterion C as a component of both the NCPDC's original 1921 and redeveloped 1969 designs.

Individual NRHP Eligibility

The power tunnel is significant under Criterion A and retains integrity to convey its significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the power tunnel alone. Thus, in the absence of individual significance, regardless of physical condition, the power tunnel cannot be considered to have integrity that conveys individual significance under Criterion A. As such, the power tunnel is recommended not eligible for individual listing in the NRHP under Criterion A.

The power tunnel is significant under Criterion B and retains integrity to convey this significance, as discussed previously. However, the power tunnel's association with Ross is linked directly with the development of the NCHP in its entirety and cannot be represented solely by the power tunnel. Thus, in the absence of individual significance, regardless of physical condition, the power tunnel cannot be considered to have integrity that conveys individual significance under Criterion B and is recommended not eligible for individual listing in the NRHP under Criterion B.

The power tunnel is significant under Criterion C and retains integrity to convey this significance, as discussed previously. However, the significance of its engineering is derived from its context within the initial NCPDC's design and function in 1921 and redeveloped NCPDC's design and function in 1969 that cannot be represented solely by the power tunnel. Thus, in the absence of individual significance, regardless of physical condition, the power tunnel cannot be considered to have integrity that conveys individual significance under Criterion C and is recommended not eligible for individual listing in the NRHP under Criterion C.

The power tunnel lacks the ability to yield information important to prehistory or history and, thus, cannot be considered to have individual significance under Criteria D. Thus, in the absence of individual significance, regardless of physical condition, the power tunnel cannot be considered to have integrity that conveys individual significance under Criterion D and is recommended not eligible for individual listing in the NRHP under Criterion D.

5.2.4 Penstock (Map ID 4)

5.2.4.1 Description

The penstock is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA. The penstock was constructed in 1921 and designed and built by the CCFC (Johnson 2010:7-44–7-45 Roberts 1924:952).

The penstock consists of 925 feet of large diameter metal pipe descending from the power tunnel to the powerhouse on a north–northwest alignment (**Figure 23**). The penstock's southern opening was placed 218 feet inside the power tunnel's northern entrance, and it proceeds 707 feet downhill to the powerhouse after daylighting from the tunnel (**Figure 24**). From the power tunnel to the base of the powerhouse's southern elevation, the penstock consists of a single metal pipe. The penstock's southern end has a pipe intake bell and is surrounded by a concrete plug, which seals the penstock to the power tunnel and forces water into the penstock. The inside of the penstock has a metal grate to prevent debris from flowing into and ultimately down into the powerhouse turbine. The diameter of the penstock gradually decreases over its alignment down the hill toward the powerhouse from 33 inches to 30 inches, while its thickness increases from 5/16-inch flange steel at the top to 3/8-inch flange steel at the base of the hill to address issues related to pressure. Dresser couplings, which also function as expansion joints, connect the penstock's approximately 20-foot-long segments at regular intervals. The penstock is supported along its downhill alignment by U-shaped poured concrete saddles, placed at regular short intervals between thrust blocks.

Figure 23. NCPDC penstock in 2021, facing south

Source: City Light 2021a.

Figure 24. NCPDC penstock in power tunnel in 2021, view unknown

Source City Light 2021b.

Six rectangularly poured concrete thrust blocks were constructed around the single penstock as it descends from the power tunnel toward the powerhouse. These thrust blocks, each uniquely designed to counter the force of water rushing down the pipe, prevent the penstock from moving and are typically located at points where the angle of the penstock's alignment changes. The first thrust block is outside the northern entrance of the power tunnel, with four thrust blocks placed at regular intervals along the penstock's downhill alignment, ending in the sixth thrust block at the base of the powerhouse (south side). It is there that the penstock splits into two separate pipes, each entering the powerhouse at the base of its south side to convey water to the pair of Pelton waterwheels inside. Due to its subterranean nature, the portion of the penstock in the power tunnel could not be documented.

The sixth thrust block adjacent to the powerhouse was slightly altered in 1970 with a rectangular extension added to its south side (City Light 1970). This new extension included a metal access hatch that contained conduit associated with the powerhouse fire suppression system (City Light 1970). Various repair and maintenance activities were conducted along the penstock's alignment in 1987, including the maintenance of the grade beneath the penstock's saddles to prevent sinking, painting of the penstock and timber saddles, the replacement of several saddles with concrete replacements, and the in-kind replacement of other saddles and repairs to Dresser couplings within the power tunnel (City Light 1987a, 1987b; City Light 1992). In 2016, the penstock's remaining timber saddles were all replaced with concrete saddles (City Light 2016). Finally, a wooden platform was constructed over the penstock at the top of the hill's first rise, just to the north of its fifth thrust block, to access both sides of the penstock during the saddle replacement project in 2016. The penstock is in good condition.

5.2.4.2 Historic Significance

NRHP Criterion A

The penstock is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its association with the 1918–1921 development of the NCHP for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem. It is also significant with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for Newhalem and station service power backup for the Gorge Powerhouse (Johnson 2010:8-46). The penstock is one of three extant components of the NCPDC from 1921, the others being the power tunnel and tailrace. Due to a fire in 1966, it was necessary to reconstruct the powerhouse to continue the operation of the NCHP; the headworks was also redeveloped during this period. (Johnson 2010:8-5). The penstock was retained and continued to function as a water conveyance component for the NCPDC. The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5).

Given its significant historic associations with the initial hydroelectric development, design, and continued operations of the NCHP and the SRHP, the penstock is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66). However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC historic area and the SRNCHP (DT 66).

NRHP Criterion B

The penstock is significant under Criterion B for its associations with J.D. Ross, a person of regional and national significance for his 28-year tenure as Superintendent of City Light over the agency's first three decades, during which he was involved substantially in the planning and construction of the NCHP and SRHP. He was also associated with promoting hydroelectric power in the region and nationally (Johnson 2010:8-50–8-51, 8-62–8-63). However, the penstock's association with Ross is linked directly with the development of the NCHP in its entirety and cannot be represented by the penstock alone. As such, the penstock is not considered individually significant under Criterion B. When considered within the context of the NCHP's development and its significant association with Ross from 1918–1939, the penstock is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66) under Criterion B.

At the time of the NCHP's redevelopment, City Light was led by Superintendent John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines within the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. As such, the penstock is not considered to have significant associations with Nelson under Criterion B.

NRHP Criterion C

The penstock was designed by City Light and built in 1921 by the CCFC. The penstock design—a single metal pipe for most of its alignment and bifurcated at the powerhouse—was quite common by 1921 as a method of conveying water over longer distances than the penstock's alignment, with examples constructed by the Seattle Water Department as early as 1901 (Oldham 2010). While the penstock's method of construction did include the innovative use of arc welding in a remote area, documentation for its claim to be the first pipeline in the Northwest to employ such a construction method is not conclusive and the technique was otherwise commonly used for other purposes by this period, having been invented in the late 1800s (Buel 2020; Allen 1921:401). Furthermore, its overall design and relatively simple descending alignment did not require any other particularly innovative construction methods or engineering. The CCFC is not considered a master builder based on thresholds established by National Register Bulletin 15 (NPS 1995).

When considered within the context of the NCPDC's 1921 and 1969 designs, the penstock's engineering is considered significant. The 1921 NCPDC design was a significant example of an early 20th century hydroelectric facility constructed for the purpose of supplying power to construction camps associated with larger hydroelectric projects in its vicinity. Due to the mountainous nature of its setting and the distance between the headworks on Newhalem Creek and the powerhouse near the Skagit River, the penstock was a necessary and integral engineered component of the NCPDC's water conveyance system. It continued to function as such in the redeveloped NCHP. The penstock retains integrity to convey the significance of this system. The penstock is thus found to be a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the penstock is not considered to be individually significant in engineering under Criterion C because

most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

NRHP Criterion D

The penstock is a common example of its engineering type that provides no important information about the general trends of hydroelectric generation facility construction or design, or hydroelectric power generation that occurred in Washington during the 1910s and 1920s that cannot be obtained through documentary sources. Therefore, the penstock has not yielded and is not likely to yield information important in prehistory or history. For this reason, the penstock cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Evaluation of Integrity

Each aspect of integrity is evaluated below.

- **Location.** The penstock retains integrity of location. The structure remains in its original location and its alignment has not changed since it was built in 1921.
- **Setting.** The penstock retains integrity of setting. The penstock has remained in a remote and heavily forested hillside since its construction. While the Tunnel Portal Trail (The Skagit Project Emergency Access Trail) was developed within its vicinity and a wooden platform was built over the penstock near its fifth thrust block, the penstock's setting on a forested hillside within the RLNRA remains largely unchanged since the period of its construction.
- **Design.** The penstock retains integrity of design. The penstock alignment is visible in its linear rise on the forested hillside south of the powerhouse, as are its multiple concrete thrust blocks, and Dressler couplings at regular intervals. The original design has been slightly diminished by the expansion of its sixth thrust block (at the base of the southern side of the powerhouse) and the replacement of its original timber saddles with concrete saddles. However, the penstock's alignment, dimensions, placement on the hillside, and structural anchors and supports (e.g., thrust blocks and saddles) have not deviated significantly from the original 1921 design.
- **Materials.** The penstock retains integrity of materials. In 1921, the materials used in the construction consisted of metal, concrete, and wood. A majority of the materials used in the penstock remains extant, among them the metal of the large-diameter pipe segments and the Dressler couplings as well as the concrete used in the six thrust blocks. Maintenance undertaken in 1987 to replace and repair the penstock's Dresser couplings appears to have been completed with in-kind materials (City Light 1987b). All the wood saddles were removed due to damage from a 2015 wildfire and replaced with concrete saddles. Although this impacted the material integrity of the 1921 penstock, when compared to the original materials used in its construction (e.g., metal, concrete, and wood), the majority of the material remains from the 1921 era. Overall, the primary engineered feature of the penstock, its single pipeline, is intact.
- **Workmanship.** The penstock retains integrity of workmanship. The penstock displays evidence of the arc welding used in its 1921 construction throughout its alignment. The concrete thrust blocks also display imprints of the wood boards used in their construction. While the replacement of the original timber saddles diminishes the workmanship, the penstock retains sufficient integrity to convey the workmanship used in its fabrication and construction.

- **Feeling.** The penstock retains integrity of feeling. Rising behind the powerhouse up the hillside, the penstock alignment, footprint, shape, and placement within a mountainous and forested environment is recognizable as an early 20th century pipeline. While its saddle alterations are visible to hikers along the Tunnel Portal Trail, its primary 1921 engineered pipeline remains intact.
- **Association.** The penstock retains integrity of association. It has remained in the place where its history unfolded—a forested, mountainous environment, south and uphill of the powerhouse where it was built in 1921 as part of the NCPDC to convey water from the headworks on Newhalem Creek to the powerhouse for the generation of power. It was reused in the 1969 redevelopment of the NCHP to continue supplying water to the powerhouse. As an intact component of the NHCP and until 2010, the penstock conveyed water for almost 90 years with limited interruptions.

Overall, the penstock meets the majority of the seven aspects of integrity. Though alterations to its features have somewhat diminished its integrity of design, materials, and workmanship, it retains integrity in location, setting, feeling, association, design, materials, and workmanship. The penstock retains sufficient overall integrity to convey its significance under Criteria A, B, and C as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendations

Eligibility as a District Contributor to the SRNCHP (DT 66)

The penstock is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the development of the NCHP from 1918–1921 for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem, and with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as a support facility for the Gorge Powerhouse. The reconstruction of the powerhouse and headworks redevelopment following the 1966 fire represents City Light's commitment to the facility's continued operation, with power production resuming in 1970. Until it ceased production in 2010, the NCHP was the oldest operating hydroelectric facility in the Skagit River area. The penstock retains integrity to convey this significance under Criterion A during the 1918–1970 period, representing both the NCHP's development from 1918–1921, as well as its redevelopment from 1967–1970 and continued operation thereafter.

The penstock is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion B, for its significant association with J.D. Ross, the Superintendent of City Light during the period of the NCPDC's original construction, who was involved substantially in the planning and construction of the SRHP and NCHP. The penstock's significance under Criterion B is limited to the 1918–1939 period, beginning with the start of planning and construction of the NCHP and ending at the end of Ross's tenure as Superintendent of City Light. As an intact original component of the NCPDC the penstock retains integrity to convey its significant association with Ross during that period.

The penstock is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion C as one component of the cohesive and intact collection of engineered components that comprise the NCPDC. As an original component, the penstock represents both the NCPDC's 1921 design and construction and the necessary and substantial improvements made in 1969 to the original engineering of the NCPDC, including the reconstruction of the powerhouse, which ensured its

continued operation and secured an increased and better regulated source of water for hydroelectric production. As a functional and integral component of the NCPDC, City Light chose to retain the penstock as part of the redeveloped system. The penstock retains integrity to convey its engineering significance under Criterion C as a component of both the NCPDC's original 1921 and redeveloped 1969 designs.

Individual NRHP Eligibility

The penstock is significant under Criterion A and retains integrity to convey this significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the penstock alone. Thus, in the absence of individual significance, regardless of physical condition, the penstock cannot be considered to have integrity that conveys individual significance under Criterion A and is recommended not eligible for individual listing in the NRHP under Criterion A.

The penstock is significant under Criterion B and retains integrity to convey this significance, as discussed previously. However, the penstock's association with Ross is linked directly with the development of the NCHP in its entirety and cannot be represented solely by the penstock. Thus, in the absence of individual significance, regardless of physical condition, the penstock cannot be considered to have integrity that conveys individual significance under Criterion B and is recommended not eligible for individual listing in the NRHP under Criterion B.

The penstock is significant under Criterion C and retains integrity to convey this significance, as discussed previously. However, the significance of its engineering is derived from its context within the initial NCPDC's design and function in 1921 and redeveloped NCPDC's design and function in 1969 that cannot be represented solely by the penstock. Thus, in the absence of individual significance, regardless of physical condition, the penstock cannot be considered to have integrity that conveys individual significance under Criterion C and is recommended not eligible for individual listing in the NRHP under Criterion C.

The penstock lacks the ability to yield information important to prehistory or history and, thus, cannot be considered to have individual significance under Criteria D. Thus, in the absence of individual significance, regardless of physical condition, the penstock cannot be considered to have integrity that conveys individual significance under Criterion D and is recommended not eligible for individual listing in the NRHP under Criterion D.

5.2.5 Tailrace (Map ID 5)

5.2.5.1 Description

The tailrace is on the south side of the Skagit River near Newhalem in Whatcom County, Washington. It is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA. The tailrace was constructed in 1921 based on plan by City Light, though available documentation does not specify the engineer or contractor responsible for the design or construction of the tailrace (City Light 1919d).

The tailrace is an excavated water channel that carries water away from the powerhouse after its turbines have produced power (**Figure 25**). The tailrace is north of the powerhouse and south of the Skagit River and confluences with an intermittent stream (City Light 2022c:E-2). The powerhouse's

concrete discharge chute flume structure extends 24 feet into the tailrace, just north of the powerhouse (**Figure 26**).

Figure 25. NCPDC tailrace channel in 2021, facing north

Source: City Light 2021e.

Figure 26. NCPDC tailrace at powerhouse in 2021, facing south

Source: City Light 2021c.

The tailrace channel is open, measuring approximately 350 feet long by 18 feet wide, extending to a fish barrier at its north (City Light 2022c:A-4). Within the tailrace channel and extending from the discharge flumes, the tailrace channel proceeds on a meandering alignment north to the Skagit River. The tailrace channel is excavated with no additional lining materials or added features, such as retaining walls. However, wood post and rail fencing has been constructed at both ends of the tailrace banks: around the eastern, northern, and western banks of the tailrace channel north of the powerhouse; and the eastern side of the fish barrier nearing the channel's northern end.

The fish barrier was constructed circa 2000 at the northern end of the tailrace (**Figure 27**). Its construction was requested by resource agencies and was included as mitigation for the NCHP's 1997 FERC license (Louter 1999e). The fish barrier is a stepped concrete structure, measuring 3.6 feet high by 18 feet wide, with 22.5-foot-long wing walls (City Light 2022c:A-4). The portions of the wing walls south of the central step are rectangular and angle outward toward the edges of the discharge channel, while the portions north of the step are trapezoidal and run parallel. An elevated viewing area accessed from the Trail of the Cedars and fenced with a wood post and rail system is adjacent to the east side of the barrier, constructed at an unknown date. These alterations are the only documented alterations to the tailrace. The natural stream of the tailrace is overgrown with vegetation and shows some evidence of bank erosion but is otherwise in fair condition and the fish barrier is in good condition.

5.2.5.2 Historic Significance

NRHP Criterion A

The tailrace has significant associations with the 1918–1921 development of the NCHP for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem. It is also significant with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and station service power backup for the Gorge Powerhouse (Johnson 2010:8-46). The tailrace is one of three extant components of the NCPDC from 1921, the others being the penstock and power tunnel. Due to a fire in 1966, it was necessary to reconstruct the powerhouse to continue operation of the NCHP; the headworks was redeveloped during this period as well (Johnson 2010:8-5). The tailrace continued to function as a water conveyance component of the redeveloped NCPDC. The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5). Though the tailrace has its significant historic associations under Criterion A, the property has been substantially altered since its construction (see *Evaluation of Integrity* for a more robust description). As such, the tailrace lacks integrity to convey this significance and is not considered significant under Criterion A, individually or as a contributor to the NCPDC historic area and the SRNCHP (DT 66).

Figure 27. NCPDC tailrace fish barrier in 2021, facing west

Source: City Light 2021d.

NRHP Criterion B

The tailrace has significant associations with J.D. Ross, a person of regional and national significance for his 28-year tenure as superintendent of City Light over the agency's three decades, during which he was involved substantially in the planning and construction of the NCHP and SRHP, and for his work promoting hydroelectric power in the region and nationally (Johnson 2010: 8-50–8-51, 8-62–8-63). Though the tailrace has significant historic associations under Criterion B, the property has been substantially altered since its construction. As such, the tailrace lacks integrity to convey this significance and is not considered significant under Criterion B. Thus, the tailrace is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

NRHP Criterion C

The tailrace was constructed based on plan by City Light; however, available documentation does not specify the engineer or contractor responsible for the design or construction of the tailrace As originally constructed, the design of the tailrace—an excavated discharge channel—was quite common by 1921 for conveying water out of hydroelectric facilities back to primary waterways and its overall design and simple meandering alignment did not require any other particularly innovative construction methods or engineering (Soderberg 1988a:F-6).

When considered within the context of the NCPDC's 1921 and 1969 designs, the tailrace's engineering is considered significant as it represents a necessary engineered component of the NCPDC's water conveyance system and continued to function as part of the redeveloped NCHP. However, the tailrace does not retain integrity to convey the significance of this system. Thus, the tailrace is not eligible as a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C.

However, the tailrace is not considered to be individually significant in engineering under Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

NRHP Criterion D

The tailrace is a common example of its engineering type that provides no important information about the general trends of hydroelectric generation facility construction or design, or hydroelectric power generation that occurred in Washington during the 1910s and 1920s that cannot be obtained through documentary sources. Therefore, the tailrace has not yielded and is not likely to yield information important in prehistory or history. For this reason, the tailrace cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Evaluation of Integrity

Each aspect of integrity is evaluated below.

- **Location.** The tailrace retains integrity of location. The site remains in its original location and its alignment has not changed since it was built in 1921.
- **Setting.** The tailrace retains integrity of setting. The tailrace's setting within a forested area between the powerhouse and Skagit River remains largely unchanged since its construction in

1921. The adjacent segment of the Trail of the Cedars was developed in 1969, and more recently, improvements have been made to the surrounding trail system and new small-scale features, such as interpretive trail signage have been introduced. However, these changes have had a limited impact on the tailrace's overall setting.

- **Design.** The tailrace's integrity of design has been affected by alterations, including the expansion of the powerhouse's discharge chutes that enclosed the northern end of the channel and the addition of a fish barrier and viewing platform at its southern end. However, the tailrace's channel's alignment and dimensions, and the design of secondary features, such as the wood fencing have remained intact.
- **Materials.** The tailrace's integrity of materials has been affected by the introduction of new materials into the excavated but generally natural intermittent stream of the tailrace, including the concrete flume structure that now extends into the tailrace at the powerhouse and the concrete fish barrier at the tailrace's north end. While the fish barrier was an approved project as part of the NCHP's 1997 FERC license, it conflicts with applicable standards of the 1998 *Newhalem Creek Hydroelectric Project FERC No. 2705 Historic Resources Management Plan*, as the barrier is not compatible in materials with the otherwise natural channel of the tailrace (City Light 1992:454, 1998:20). Therefore, this particular alteration is considered a modification to the tailrace that has a substantial impact on its integrity of materials, and to a lesser extent its design.
- **Workmanship.** Workmanship is an aspect of integrity not generally applicable to the tailrace, given its simple construction through excavation of a natural intermittent streambed. However, its workmanship has been affected by its alterations, which have introduced new elements and materials, such as powerhouse flume structure and fish barrier.
- **Feeling.** The tailrace does not retain integrity of feeling. The tailrace alignment within a mountainous and forested environment could be recognizable as an early 20th century tailrace; however, the addition of the fish barrier and, to a lesser degree, the powerhouse's concrete flume structure have affected its ability to convey the original simple design used in 1921. The noted alterations have changed the general appearance of the tailrace, with constructed features intruding on the originally excavated but generally natural intermittent stream.
- **Association.** The tailrace retains integrity of association. It has remained in the place where its history unfolded—a forested, intermittent creek and riverside environment north of the powerhouse where it was built in 1921 as part of the NCPDC to convey water discharged from the powerhouse to the Skagit River. The tailrace was in continuous use until 2010 when the powerhouse ceased operation. Although the tailrace's alterations have affected its association with the NCPDC, the property through its proximity to the extant powerhouse and the introduction of interpretive signage in the tailrace's vicinity noting its history within the NCPDC, continues to maintain its association with the NCPDC.

Overall, the tailrace does not meet the majority of the seven aspects of integrity. While it retains integrity in location, setting, and association, alterations to the property have affected its integrity of design, materials, workmanship, and feeling to such a degree that the tailrace does not retain sufficient overall integrity to convey its significance under Criteria A and B as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendations

Eligibility as a District Contributor to the SRNCHP (DT 66)

The tailrace is not recommended as a contributor to the SRNCHP (DT 66) under Criterion A, B, or C. While the tailrace has significant historic associations with NCHP's 1918-1921 development and 1967–1970 redevelopment, with J.D. Ross, and engineering significance as a necessary component of both the 1921 and 1969 designs, the tailrace does not retain integrity to convey its significance.

Individual NRHP Eligibility

The tailrace has significant associations under Criteria A, B, and C as discussed previously. However, the tailrace does not retain integrity to convey these significant associations. Furthermore, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the tailrace alone. The tailrace also lacks the ability to yield information important to prehistory or history and, thus, cannot be considered to have individual significance under Criterion D. Thus, in the absence of individual significance, regardless of physical condition, the tailrace cannot be considered to have integrity that conveys individual significance under Criteria A, B, C, or D. As such, the tailrace is recommended not eligible for individual listing in the NRHP under any Criteria.

5.2.6 Transmission line (Map ID 6)

5.2.6.1 Description

The transmission line is in Sections 21 and 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA. The transmission line was constructed in 1965 based on a design by City Light; however, available documentation does not specify the engineer or contractor responsible for its construction.

The existing alignment of the transmission line runs north from the powerhouse, where it crosses over the Skagit River (**Figure 28**). It then proceeds underground in a circuitous but generally easterly route through Newhalem, behind (south of) the Silk Stocking Row houses, then along the road adjacent to the northern bank of the Skagit River, where it crosses the Skagit River again within a conduit affixed to the Skagit/Newhalem/Gorge Suspension Bridge and terminates at the Gorge Powerhouse. The 4,387-foot-long transmission line is predominantly underground, including 350 feet of buried cable from the powerhouse to the Skagit River crossing and 3,000 feet through the town of Newhalem (City Light 2022c:A-4). The remaining 1,037 feet of cable is aboveground, including the first 400-foot overhead Skagit River crossing, and the second 637 foot Skagit River crossing from the town of Newhalem to the Gorge Powerhouse (City Light 2022c:A-4). Other aboveground components consist of three ground concrete pad mounted transformers to the immediate west of powerhouse, wood power poles, the conduit on the Gorge Suspension Bridge, and access vaults throughout Newhalem.

Figure 28. NCPDC transmission line Skagit River crossing in 2021

Source: City Light 2022d.

The transmission line's supports on each side of the Skagit River north of the powerhouse consist of three tall (40 or 50 feet) wood poles spaced evenly apart with each anchored by utility guy wires. Several individual poles have metal conduits affixed to them, and associated distribution equipment (e.g., smaller cylindrical transformers typically seen in residential areas) attached to the poles. Between the trios of poles, lines run across the river in three sets of four vertically spaced wires. At the Gorge Suspension Bridge, the transmission line is within conduit consisting of a set conduit runs surface affixed at the bottom of the south side of the bridge. The underground transmission line's access vaults throughout Newhalem are all similar in design—steel access hatches set flush at ground level into concrete pads, which open into underground concrete vaults or boxes. The size and number of the access hatches and pads vary at different access points along the transmission lines' alignment. Some pads contain multiple hatches, while other pads contain just a single hatch.

The underground alignment of the transmission line through Newhalem was substantially changed in 2000. Whereas the previous alignment proceeded generally east–northeast from the northern side of the Skagit River crossing to the Gorge Suspension Bridge along the north bank of the river, the alignment built in 2000 takes a more circuitous route through Newhalem. From the NCPDC powerhouse/Skagit River crossing, the line runs northwest under Cherry Blossom Lane to a point just east of the extant City Light Administration Building and then turns east. It crosses Seattle City Light Street and Cherry Blossom Lane before turning northeast and running along the river to the south of the residential structures built along Silk Stocking Road. Here the line turns northwest and crosses under Silk Stocking Road to a point on the north side of the road's right-of-way before turning northeast again and running along the right-of-way of Silk Stocking Road/Ladder Creek Lane. The line turns slightly east as it nears the extant building at 665 Ladder Creek Lane and crosses Ladder Creek Lane to the north bank of the Skagit River. It then immediately turns back across Ladder Creek Lane to run northeast within the current City Light compound at this location before again crossing east under Ladder Creek Lane and extending along the curved right-of-way of Ladder Creek Lane to the Gorge Pedestrian Suspension Bridge. Here the line crosses the Skagit River within an aboveground conduit affixed to the south side of the bridge. On the eastern bank of the river, the line continues north–northeast before turning west to enter the east side of the Gorge Powerhouse. (City Light 2000a).

Alterations to the aboveground features of the transmission line include the replacement of the 1965 pairs of wood poles on each side of the Skagit River crossing with trios of pole after 2000, and the expansion of the Gorge Suspension Bridge conduit from a single to a set of three conduits after 1965 (City Light 1965a, 1965b; 1965c). The transmission line's aboveground components are in good condition. Its underground components could not be documented; therefore, the condition of these components is unknown.

5.2.6.2 Historic Significance

NRHP Criterion A

The transmission line is significant under Criterion A for its association with planned improvements to the NCPDC's electric power distribution network in the 1960s as part of City Light's continued operation of the facility for local power production for Newhalem and as station service power backup plant for the Gorge Powerhouse (Johnson 2010:46). This project followed two decades of expansion and redevelopment in the town of Newhalem and was likely pursued to improve the town's local electrical distribution network (Johnson 2010:8-16–8-19). Due to the fire in 1966, it was necessary to reconstruct the powerhouse to continue operation of the NCHP; the headworks

was redeveloped during this period as well (Johnson 2010:8-5). The transmission line was constructed in 1965 prior to the fire and, thus, was a planned improvement rather than part of the redevelopment project necessitated by the damage to the facility's components. The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5). Though the transmission line has significant historic associations, its underground alignment has changed, and alterations have been made to its aboveground components (see *Evaluation of Integrity* for a more robust description). As such, the transmission line lacks integrity to convey this significance and is not considered significant under Criterion A, individually or as a contributor to the NCPDC historic area and the SRNCHP (DT 66).

NRHP Criterion B

The transmission line is not associated with any individuals that played a significant role in national, regional, or local history. At the time of the transmission line's construction, City Light was led by John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines in the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. Furthermore, research provided no indication that any other individuals potentially associated with the property played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2020). As such, the transmission line is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

NRHP Criterion C

The transmission line was designed by City Light; however, available documentation does not specify the engineer or contractor responsible for its construction. The line is representative of common design and construction methods for electric transmission infrastructure in the latter half of the 20th century (Allen et al. 2020:4-9). Most of the line is underground, constructed using underground trenching in which the line is buried. Aboveground, the line is either common overhead line supported by wood poles or in the conduit along the Suspension Bridge. The design and method of construction of the line's individual components did not necessitate innovative engineering or employ new or uncommon materials. Furthermore, the transmission line does not retain its original underground alignment through Newhalem, a key component of its design, and alterations to its aboveground components have undermined the integrity of the line overall. Given the transmission line represents a common engineering type and lacks integrity, the property is not considered significant under Criterion C. Thus, the transmission line is not eligible individually or as a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C.

NRHP Criterion D

The transmission line is a common example of its engineering type that provides no important information about the general trends in the design and construction of electric transmission infrastructure that occurred in Washington during the latter half of the 20th century that cannot be

obtained through documentary sources. Therefore, the transmission line has not yielded and is not likely to yield information important in prehistory or history. For this reason, the transmission line cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Evaluation of Integrity

Each aspect of integrity is evaluated below.

- **Location.** The transmission line does not retain integrity of location. While individual features, such as the Skagit River crossing poles may be in their original locations, the line's 1965 underground alignment in Newhalem was substantially altered in 2000, though portions of its alignment south and east of the Skagit River and along the curved section of Ladder Creek Lane appear to remain intact.
- **Setting.** The transmission line retains integrity of setting. The transmission line retains its integrity of setting as its aboveground components, from the powerhouse to the south side of Newhalem and across the Suspension Bridge, remains largely unchanged since the line's construction in 1965.
- **Design.** The transmission line does not retain integrity of design. The transmission line's alignment—a key component of its design—has been changed, suggesting further alterations to the design of its underground features as the replacement alignment likely included new construction throughout Newhalem. Furthermore, its documented aboveground components have been altered since its construction, including the replacement of the original pairs of wood poles on each side of the Skagit River, first with trios of poles, and the expansion of the Suspension Bridge conduit from a single pipe to a set of three pipes.
- **Materials.** The transmission line retains integrity in materials. Constructed in 1965, the line used wood poles, porcelain and/or glass insulators, and aboveground and belowground wire and cables, concrete for access vaults with metal for cover panels. The 2000 alteration to its underground portions in Newhalem suggests further alteration to the line's materials through the replacement of buried conduit. The transmission line's aboveground components have also been replaced, though replacement features, such as support poles are generally the same materials as the 1965 line. While replacement of features has occurred, the materials of replacement features have likely been in-kind with the 1965 line.
- **Workmanship**. The transmission line retains integrity in workmanship. The construction methods for the construction of underground and aboveground transmission lines have been consistent for much of the 20th century, including the installation of aboveground poles and lines, and in the latter half of the 20th century, the trenching and burial of underground conduit. Once constructed, transmission lines have few signifiers of the workmanship or equipment involved in their construction.
- **Feeling**. The transmission line retains integrity of feeling. The transmission line components visible aboveground are representative of transmission line infrastructure typically seen in residential areas and contribute to Newhalem's broader feeling as a hub of hydroelectric power generation.
- **Association**. The transmission line retains integrity of association. It has remained in the place where its history unfolded—within the town of Newhalem and connecting the NCHP to the SRHP's Gorge Powerhouse. Despite its alterations, the transmission line remained an active

component of the NCHP until 2010, transmitting generated power from the NCHP to the Gorge Powerhouse. The overhead Skagit River crossing has also served as a key visible connection between the NCPDC and the town of Newhalem.

Overall, the transmission line does not meet the majority of the seven aspects of integrity. While it retains integrity in setting, materials, workmanship, and feeling and association, alterations to the property have undermined its integrity of location and design to such a degree that the transmission line does not retain sufficient overall integrity to convey its potential significance under Criterion A as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendations

Eligibility as a District Contributor to the SRNCHP (DT 66)

The transmission line is not recommended as a contributor to the SRNCHP (DT 66) under Criteria A, B, or C. While the transmission line has significant historical associations with NCHP following its 1967–1970 redevelopment, the transmission line does not retain integrity to convey significance under Criterion A. The transmission line does not share the district's association with Ross and represents a common form of its engineering type and lacks integrity to convey engineering significance as a component of the NCPDC. Therefore, the transmission line is not recommended as a contributing resource to the SRNCHP (DT 66) under Criteria B or C.

Individual NRHP Eligibility

The transmission line has significant associations under Criterion A as discussed previously. However, the transmission line does not retain integrity to convey individual significance under Criterion A. Without meaningful connection to an individual important to history, lacking individual engineering significance and having lost integrity in location, design, materials, and workmanship, and lacking the ability to yield information important to prehistory or history, the transmission line cannot be considered to have individual significance under Criteria B, C, or D. Thus, in the absence of individual significance, regardless of physical condition, the transmission line cannot be considered to have integrity that conveys individual significance under Criteria B, C, or D. As such, the transmission line is recommended not eligible for individual listing in the NRHP under Criteria B, C, or D.

5.2.7 Newhalem Creek Bridge (Map ID 7)

5.2.7.1 Description

The Newhalem Creek Bridge is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA. The Newhalem Creek Bridge was constructed in 1968 based on a design by City Light, though available documentation does not specify the engineer or contractor responsible for its construction (City Light 1968a). Newhalem Creek Bridge replaced an existing log stringer bridge, likely constructed by USFS, over Newhalem Creek on Powerhouse Road that had been washed out by high water (City of Seattle 1969:Exhibit N).

The Newhalem Creek Bridge is a single span steel beam bridge approximately 85 feet long (**Figure 29**). Parallel horizontal I-beams ran the length of the span between the bridge's concrete abutments, with the metal grate deck supported by perpendicular I-beam girders placed at short

regular intervals and reinforced further by slim diagonal supports below. A horizontal thrie-beam standard highway guardrail lined either side of the bridge, supported by steel I-beam rail posts spaced at regular intervals down each side of the bridge. The only documented alteration to the Newhalem Creek Bridge is a modification to make it wheelchair accessible for use as footbridge associated with the Linking Trail, a stipulation included in City Light's 1998 *Historic Resources Mitigation and Management Plan* related to the NCHP's licensing application in 1997 (City Light 2022c:E-40). This alteration was observed during the current survey, consisting of a narrow steel panel extending across the north edge of the bridge on top of its metal grate deck. Additionally, the thrie-beam guardrails of the Newhalem Creek Bridge have been substantially dented near their western end, likely from a tree falling across the bridge. The Newhalem Creek Bridge is otherwise in good condition.

5.2.7.2 Historic Significance

NRHP Criterion A

The Newhalem Creek Bridge is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its association with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the NCHP for local power production for the town of Newhalem and as station service power backup for the Gorge Powerhouse (Johnson 2010:46). Due to a fire in 1966, it was necessary to reconstruct the powerhouse to continue operation of the NCHP; the headworks was redeveloped during this period as well (Johnson 2010:8-5). Newhalem Creek Bridge was constructed during this redevelopment phase to facilitate vehicular access to the 1969 powerhouse construction site.

Given its significant historic associations with the redevelopment of the NCHP in 1967–1970, which allowed for continued operations of the NCHP and the SRHP, the Newhalem Creek Bridge is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66). However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and SRNCHP (DT 66).

NRHP Criterion B

The Newhalem Creek Bridge is not associated with any individuals that played a significant role in national, regional, or local history within the NCHP or the SRHP. At the time of the powerhouse's construction, City Light was led by Superintendent John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines within the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. Furthermore, research provided no indication that any other individuals potentially associated with the property played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2020). As such, the Newhalem Creek Bridge is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

Figure 29. Newhalem Creek Bridge in 2022

ICF 2022

NRHP Criterion C

The Newhalem Creek Bridge was designed by City Light, though available documentation does not specify the engineer or contractor responsible for its construction. The bridge is a single-span steel bridge typical of small bridge construction during this period. However, the bridge design and materials remain entirely intact, with its only alteration introducing the wheelchair walkway to the bridge's deck. Furthermore, it is also one of two extant beam bridges constructed by City Light near the SRNCHP (DT 66), the other being the Windy Gap Railroad Bridge (b. 1937) (Johnson 2010:7-42). All other bridges identified within the historic district are either suspension bridges or truss bridges constructed prior to 1952, except for the Trail of the Cedars Suspension Bridge, built c. 1975 (Johnson 2010:7-26, 7-29, 7-32, 7-80). As the only post-World War II beam bridge extant within the SRNCHP (DT 66), the Newhalem Creek Bridge is a unique example of City Light's small-scale bridge construction in this period. The Newhalem Creek Bridge is, thus, found to be a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the Newhalem Creek Bridge is not considered to be individually significant in engineering under Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

NRHP Criterion D

The Newhalem Creek Bridge is a common example of its engineering type that provides no important information about the general trends of bridge construction or design that occurred in Washington during the late 1960s that cannot be obtained through documentary sources. Therefore, the Newhalem Creek Bridge has not yielded and is not likely to yield information important in prehistory or history. For this reason, the Newhalem Creek Bridge cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Evaluation of Integrity

Each aspect of integrity is evaluated below.

- **Location.** The Newhalem Creek Bridge retains integrity of location. The structure has remained in its original location since it was built in 1968.
- **Setting.** The Newhalem Creek Bridge retains integrity of setting. The bridge's heavily forested setting on the south side of the Skagit River has remained largely consistent since its construction. Impacts have been though the construction of the RLNRA Newhalem Creek Campground and NCVC and NPS development of recreational trails, such as the Linking Trail and Rock Shelter Trail in its vicinity. These have minimally diminished its remote surrounding.
- **Design.** The Newhalem Creek Bridge retains integrity in design. The design of the bridge is consistent with its 1968 construction drawings, except for the added steel panel extending across the northern edge of the bridge on top of its metal grate deck for wheelchair accessibility. However, this alteration only obscures a narrow portion of the metal grate deck. Otherwise, the design of the Newhalem Creek Bridge is fully intact.
- **Materials.** The Newhalem Creek Bridge retains integrity in materials. The bridge materials consist of metal, including its steel I-beams, girders, supports, and guardrails, and concrete for its abutments. The only alteration is the added steel panel extending across the north edge of the bridge on top of its metal grate deck. While this alteration introduced new materials across a narrow portion of the metal grate deck, this new material is consistent with the bridge's historic materials, which it otherwise has fully retained.
- **Workmanship.** The Newhalem Creek Bridge retains integrity in workmanship. The bridge's method of construction, a short single-span consisting of concrete abutments and metal beams and girders, were common for post-war bridges over minor waterways. The workmanship exhibited by the deck has not been affected by the introduction of the wheelchair walkway and other elements, as well as the bridge as whole, still reflect the construction methods and materials used in the bridge's construction.
- **Feeling.** The Newhalem Creek Bridge retains integrity of feeling. The bridge has only been minimally altered and changes to its immediate vicinity have been limited. Thus, the experience of the bridge and its isolated location on Newhalem Creek remain the same as its period of construction.
- **Association**. The Newhalem Creek Bridge retains integrity of association. It has remained in the place where its history unfolded—on Powerhouse Road at Newhalem Creek and has facilitated vehicular access to the powerhouse since its construction.

Overall, the Newhalem Creek Bridge retains integrity in all seven aspects. Thus, it retains overall integrity to convey its significance under Criteria A and C as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendations

Eligibility as a District Contributor to the SRNCHP (DT 66)

The Newhalem Creek Bridge is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the redevelopment of the NCHP from 1967–1970,

which ensured the continued operation of the facility for local power production for the town of Newhalem and as a support facility for the Gorge Powerhouse. The construction of the Newhalem Creek Bridge facilitated vehicular access to the 1969 powerhouse construction site, supporting the reconstruction of the powerhouse. The Newhalem Creek Bridge retains integrity to convey this significance under Criterion A during the 1968–1970 period, the date of the property's completion to the year the redeveloped NCHP began producing power.

The Newhalem Creek Bridge is not recommended as a contributor to the SRNCHP (DT 66) under Criterion B. The district is listed in the NRHP under Criterion B for its significant association with J.D. Ross, the head of City Light from 1911–1939 who was involved substantially in the planning and construction of the SRHP and NCHP. As the bridge was constructed well after 1939, the property does not share this association with Ross.

The Newhalem Creek Bridge is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion C as intact and unique example of small-scale bridge construction by City in the post-World War II period. The Newhalem Creek Bridge retains integrity to convey its engineering significance under Criterion C in 1968, the date of its construction.

Individual NRHP Eligibility

The Newhalem Creek Bridge is significant under Criterion A and retains integrity to convey this significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the Newhalem Creek Bridge alone. Thus, in the absence of individual significance, regardless of physical condition, the Newhalem Creek Bridge cannot be considered to have integrity that conveys individual significance under Criterion A. As such, the Newhalem Creek Bridge is recommended not eligible for individual listing in the NRHP under Criterion A.

The Newhalem Creek Bridge is significant under Criterion C and retains integrity to convey this significance, as discussed previously. However, the significance of its engineering is derived from its context within the NCPDC and SRNCHP (DT 66) that cannot be represented solely by the Newhalem Creek Bridge. Thus, in the absence of individual significance, regardless of physical condition, the Newhalem Creek Bridge cannot be considered to have integrity that conveys individual significance under Criterion C. As such, the Newhalem Creek Bridge is recommended not eligible for individual listing in the NRHP under Criterion C.

Without meaningful connection to an individual important to history, and unable to yield information important to prehistory or history, the Newhalem Creek Bridge cannot be considered to have individual significance under Criteria B or D. Thus, in the absence of individual significance, regardless of physical condition, Newhalem Creek Bridge cannot be considered to have integrity that conveys individual significance under Criteria B or D. As such, the Newhalem Creek Bridge is recommended not eligible for individual listing in the NRHP under Criteria B or D.

5.2.8 Trail Network (Map ID 8)

5.2.8.1 Description

The trail network is in Sections 21 and 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA. The trail network in the vicinity of the NCPDC includes two trails, the Trail of the Cedars and the Tunnel Portal Trail.

The Trail of the Cedars, first constructed in c. 1920 and redeveloped in 1969, is a 0.6-mile loop northwest of the powerhouse in the forested area along the south bank of the Skagit River (City Light 1992:7-2, 2022c:E-38; Johnson 2010:8-50). The southern segment of the current Trail of the Cedars loop was developed in c. 1920 on the alignment of the skid road built during the construction of the 1921 NCPDC powerhouse (City Light 1920e; City Light 1920g). This first iteration of the Trail of the Cedars was used as part of City Light's SRHP tours in the 1920s and 1930s. After an "ample meal served in the huge community hall" the first evening of the two-day tour, guides led visitors over a pedestrian bridge and through a "pleasant woodland trail" to Newhalem Creek, where the small powerhouse stood as a point of interest among the majestic cedars (Federal Writers Project 1941:513; Johnson 2010:50). It is unknown if the trail was given a name at the time, or if it was, what name it was known by. This original alignment of the Trail of the Cedars, as a recreational trail, was mapped in 1963 (**Figure 30**) and again in 1969 (**Figure 4**), with a northeasterly alignment from the Powerhouse to the Skagit/Newhalem – Trail of the Cedars Suspension Bridge (USGS 1963). The Trail of the Cedars was expanded in 1969, with a second segment added closer to the riverbank to create the current loop, with the trail's original alignment from the bridge to the powerhouse retained as the trail's southern segment (City Light 1992:7-2). The expansion project was completed by City Light in collaboration with the University of Washington's College of Forest Resources as part of City Light's effort to incorporate the reconstructed powerhouse into its promotional tours during this period (City Light 1971c:11). The Trail of the Cedars is graveled and generally oriented northeast–southwest within a heavily forested flat area between the powerhouse and the Skagit/Newhalem – Trail of the Cedars Suspension Bridge (**Figure 31**). Several plastic barrel drainage culverts cross the trail at natural drainage points, and signage interpreting its botanical species has been placed along the trail. Since its expansion, the alignment of the Trail of the Cedars has not been altered and its surfacing materials are well maintained and in good condition.

The Tunnel Portal Trail (now part of the SRHP Emergency Access Trail) was likely constructed by City Light during the 1967–1970 redevelopment of the NCHP as an access trail to facilitate maintenance of the penstock and power tunnel following the 1966 fire The trail was mapped as an existing trail in 1987 in City Light construction drawings for maintenance of the penstock (City Light 1987b.) The Tunnel Portal Trail's alignment from the powerhouse to the penstock incorporated a segment of the Gatehouse Trail (**Figure 4**), the original access trail to the headworks from the powerhouse (City Light 1920 g; City Light 1992:7-4). From a point above the powerhouse and to the east of the penstock, the Tunnel Portal Trail branches south off the Gatehouse Trail segment and ascends the hill to the northern terminus of the power tunnel. The remainder of the Gatehouse Trail is no longer in use and was not observed during field investigations. The alignment of the Tunnel Portal Trail has been retained since its construction and is currently used as an emergency access trail per the Skagit Emergency Action Plan. Its surfacing materials are well maintained with gravel along the incorporated Gatehouse Trail segment and wood plank boardwalks have been built over natural drainages. However, the trail surface gradually transitions to loose rock at higher elevations, and several timber steps built into the hillside to prevent further erosion.

5.2.8.2 Historic Significance

NRHP Criterion A

The trail network is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its association with the 1918–1921 development of the NCHP for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem, as well as

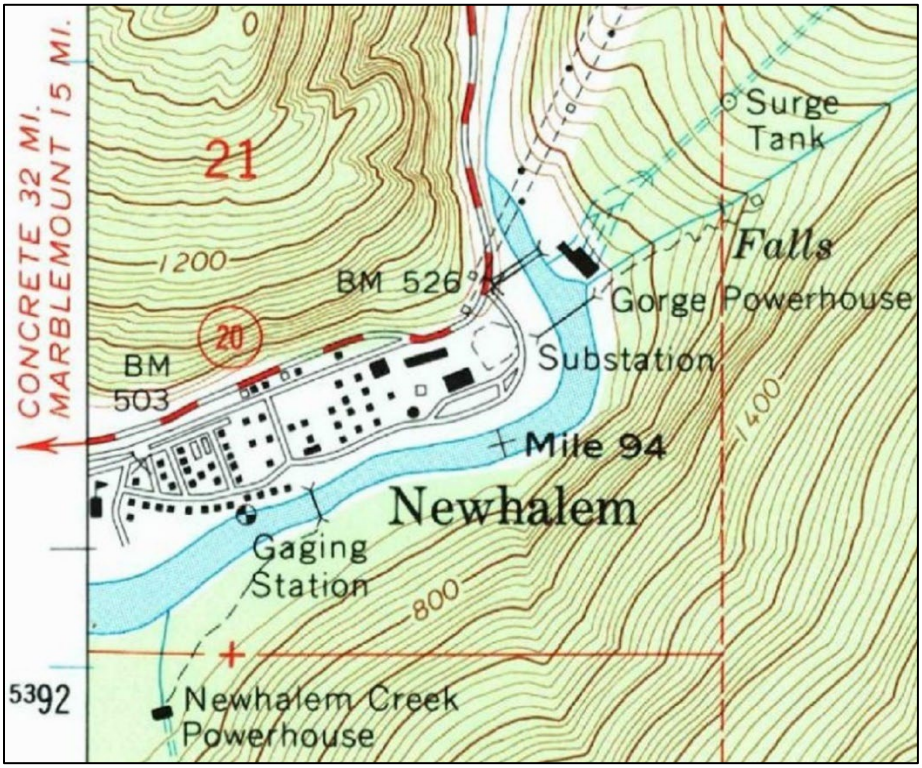
City Light's use of the powerhouse throughout the 20th century in its promotional and interpretive tours. Following the completion of the 1921 powerhouse, the alignment of the 1920 skid road between the site of the current Skagit/Newhalem – Trail of the Cedars Suspension Bridge and the 1921 powerhouse was redeveloped as a pedestrian trail used as part of City Light's promotional tours (Johnson 2010:50; City Light 1971c:11). The current looped Trail of the Cedars was developed in 1969 as part of City Light's efforts to further incorporate the reconstructed powerhouse into its promotional tours during this period (City Light 1971c:11; City Light 1992:7-2). The Tunnel Portal Trail was likely developed during the 1969–1970 redevelopment of the NCPDC to facilitate maintenance of the penstock and power tunnel after the 1966 fire; the lower portion of the Tunnel Portal Trail incorporated a segment of the Gatehouse Trail from the powerhouse to the penstock.

Given its significant historic associations with the initial hydroelectric development of the NCHP and the SRHP, and with City Light's use of these facilities as part of their promotional tours, the trail network is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66). However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and SRNCHP (DT 66).

NRHP Criterion B

While the Trail of the Cedars was developed during Ross' tenure as Superintendent of City Light, available documentation does not suggest that Ross was involved in its planning and construction in a similar manner to other components of the NCPDC. Rather, the Trail of the Cedars was first a skid road to the powerhouse construction site built to facilitate construction activities. Similarly, though the Trail of the Cedars was redeveloped as a pedestrian trail following the completion of the NCPDC and used during City Light's 1920s and 1930s promotional tours organized by Ross, the trail's function as part of those tours was far more limited than properties more closely associated with Ross's tours, such as Ladder Creek Falls Gardens, serving merely as an access route to the powerhouse. Though the Tunnel Portal incorporated a segment of the Gatehouse Trail as part of its alignment, the trail was developed during the 1967–1970 redevelopment of the NCHP and, thus, does not share any association with Ross. As such, the trail network cannot be considered to have significant associations with J.D. Ross. Furthermore, research provided no indication that any other individuals potentially associated with the property played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2020). Thus, the trail network is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

Figure 30. Excerpt of U.S. Geological Survey Topographical Map of Newhalem and NCPDC in 1963 Showing Trail of the Cedars Alignment



Source: USGS 1963.

Figure 31. Trail of the Cedars c. 2021, View Unknown

Source: City Light n.d.b.

NRHP Criterion C

The two trails included in the trail network, the Trail of the Cedars and Tunnel Portal Trail, were developed by City Light. The trails have varying degrees of design intent and continued maintenance and use. The Trail of the Cedars, developed c. 1920, does include some associated features typical of designed trails, such as its gravel surfacing materials, culverts (plastic barrel in this case), and signage. However, these are modern alterations to the trail and not documented as original design features. It also lacks other common features, such as delineated path boundaries in the form of fencing or curbing and constructed benches or viewing platforms (Coffin Brown n.d.:14). The Tunnel Portal Trail, likely constructed in 1967–1970, also includes features, such as gravel surfacing and wood plank boardwalks over natural drainages. However, these are not significant design features, and the trail lacks features of designed trails. As such, the trail network is not considered significant under Criterion C, individually or as a contributor to the NCPDC historic area and the SRNCHP (DT 66).

NRHP Criterion D

The trail network includes common examples of access trails that do not provide important information about the general trends in trail construction or design that occurred in Washington during the 20th century that cannot be obtained through documentary sources. Therefore, the trail network has not yielded and is not likely to yield information important in prehistory or history. For this reason, the trail network cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Evaluation of Integrity

Each aspect of integrity is evaluated below.

- **Location.** The trail network retains integrity of location. The historic alignment of the Trail of the Cedars has been retained as the southern segment of the current loop and alignment of the Tunnel Portal Trail has not changed, including the incorporated segment of the Gatehouse Trail in its alignment.
- **Setting.** The trail network retains integrity of setting. The network's setting within a forested and mountainous setting on the south side of the Skagit River has been largely consistent since the various periods of development for its constituent components. While the redevelopment of the powerhouse occurred in the vicinity of the Trail of the Cedars and Tunnel Portal Trail, the 1969 powerhouse had a limited impact on the setting of these trails due to its compatibility with the 1921 building and surrounding landscape.
- **Design.** The trail network's integrity of design has been slightly affected by the expansion of the Trail of the Cedars into a loop and the introduction of small-scale features along its alignment. However, the current Trail of the Cedars loop incorporated its historic alignment as the southern of its two segments, limiting the impact of this alteration. The Tunnel Portal Trail alignment has not changed and the design features, such as its boardwalks remain intact.
- **Materials.** The trail network's integrity of materials has been slightly affected by the introduction of small-scale features of modern materials to the Trail of the Cedars, including plastic barrel culverts, and a lack of maintenance of the upper segment of the Tunnel Portal Trail's alignment. However, the gravel surfacing of the Trail of the Cedars has been well maintained and would be compatible with its original natural surfacing materials. The lower

segment of the Tunnel Portal Trail, formerly part of the Gatehouse Trail, is also well maintained and its gravel surfacing would be compatible with its original natural surfacing materials, though the Tunnel Portal Trail's upper segment suffers from erosion and vegetation overgrowth causing the loss of its surfacing materials.

- **Workmanship.** The trail network's integrity of workmanship has been slightly affected, corresponding to the noted alterations to the Trail of the Cedar's design and materials. However, the trail network was already limited in this aspect, as both the Trail of the Cedars and Gatehouse Trail section of the Tunnel Portal Trail were originally developed as simple footpaths and lack elaborate design features that better exemplify workmanship in trail design and construction.
- **Feeling.** The trail network retains integrity of feeling. The Trail of the Cedars has retained its interpretive and recreational aspects and can still be experienced in largely the same setting as during its period of construction, despite features, such as the 1969 powerhouse and tailrace fish barrier that have been introduced in its vicinity. Likewise, the Tunnel Portal Trail has not been altered and its setting behind (south) and above the powerhouse has not changed.
- **Association.** The trail network retains integrity of association. The Trail of the Cedars retains its close association with the powerhouse as a recreational and interpretive trail between the town of Newhalem and the powerhouse. Likewise, the Tunnel Portal Trail retains its own associations with the penstock and power tunnel as a maintenance access trail and with the SRHP as an emergency evacuation route.

Overall, the trail network meets all seven aspects of integrity. The trail network retains integrity in location, setting, design, materials, workmanship, feeling, and association. As such, the trail network retains integrity to convey its significance under Criterion A as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendations

Eligibility as a District Contributor to the SRNCHP (DT 66)

The trail network is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the 1918–1921 development of the NCHP for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem and City Light's use of the powerhouse throughout the 20th century in its promotional and interpretive tours. The trail network retains integrity to convey this significance under Criterion A during the 1920–1970 period, representing the development of the Trail of Cedars as an access trail used in City Light's promotional tours of the NCPDC powerhouse and SRHP, the development of the Tunnel Portal Trail during the redevelopment of the NCHP, and the expansion of the Trail of the Cedars to better incorporate the reconstructed NCPDC powerhouse into City Light's promotional tours.

The trail network does not share the district's association with Ross and represents a common form of its trail design and construction. Therefore, the trail network is not recommended as a contributing resource to the SRNCHP (DT 66) under Criteria B or C.

Individual NRHP Eligibility

The trail network has significant associations under Criterion A and retains integrity to convey this significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and its association with the SRHP and cannot be represented by the trail network alone. Thus, in the absence of individual significance, regardless of physical condition, the trail network cannot be considered to have integrity that conveys individual significance under Criterion A. As such, the trail network is recommended not eligible for individual listing in the NRHP under Criterion A.

Without meaningful connection to an individual important to history, lacking individual design or construction significance, and unable to yield information important to prehistory or history, the headworks cannot be considered to have individual significance under Criteria B, C, or D and is not recommended eligible for individual listing in the NRHP under those criteria.

5.2.9 Access Roads (Map ID 9)

5.2.9.1 Description

The access roads are in Sections 20, 28 and 29 of Township 37 North, Range 12 East within the boundaries of the RLNRA. They are located on the south side of the Skagit River near Newhalem in Whatcom County, Washington. The access roads in the vicinity of the NHCP include two roads, the Dam Access Road and Powerhouse Road.

The road referred to as the Dam Access Road provides access to the headworks from the west side of Newhalem Creek, although the road was not constructed by City Light, and it is not associated with the NCHP's 1919–1921 development. However, Dam Access Road was used by City Light during the redevelopment of the headworks in 1967–1969 to transport equipment and materials to the headworks site. Limited information is available related to the development of the Dam Access Road. Based on available historic maps and contextual information, it is estimated to have been constructed between 1919 and 1953 in relation to USFS timbering activities in this area. In 1919, transportation routes along the Skagit River in the vicinity of Newhalem consisted of a single unimproved road or trail along the north side of the Skagit River; no roads or trails were mapped along the south side of the river (City Light 1919e). Access to the south side of the river was first provided during the early 20th century by a log bridge built by USFS prior to 1953—replaced by the USFS constructed Skagit River Bridge in 1959—and early logging roads were developed, including the unimproved road that would become known as Dam Access Road (USGS 1953; Neely 2020:6).

The 1953 alignment of the road generally followed the current alignment, proceeding south from State Route 20 across the Skagit River. On the south side of the river, it continued south and then southwest, with short branches off the road's eastern and southern sides, before turning back east to Newhalem Creek and running south along the cliff above the creek past the headworks into the backcountry (USGS 1953). Maps and historic aerials of the area since 1953 show that alignment of Dam Access Road has remained roughly the same since 1953 (USGS 1958, 1979, 1989, 1999, 2011; City of Seattle 1969:Exhibit L).

The road was improved in the late 1980s, as depicted in a 1989 USGS map from State Route 20 to the point at which it crossed an unnamed creek west of Newhalem Creek (USGS 1979, 1989; NETR 1984). This improvement was likely limited to widening and graveling, as the road did not appear to be paved until 1998 in historic aerial photographs; at that time only the northern segment from

State Route 20 to the entrance for the NCVC parking lot was paved, suggesting that these improvements were undertaken by NPS within the vicinity of its facilities (NETR 1984, 1998). No further changes to the Dam Access Road's design or materials have occurred since 1998. The road's surface materials between State Route 20 and the NCVC parking lot are well maintained and in good condition. However, its surfacing gradually deteriorates from that point onward, becoming an unmaintained two track-road until the point vehicle access ends. However, the section of Dam Access Road that continues to the headworks and beyond (south of) along Newhalem Creek has been abandoned and is informally used as a trail to access the backcountry in the upper portions of the drainage. The road was closed to vehicles in 2019 beginning at a point approximately 0.3-mile northwest of the headworks, where a landslide has covered the road. Light vegetative overgrowth obscures the road between this point and the headworks, becoming more heavily overgrown beyond the headworks, obscuring the road completely. However, Dam Access Road south of the headworks was not documented.

Though colloquially named for the access it currently provides to the powerhouse from the west side of Newhalem Creek, Powerhouse Road was also not constructed by City Light, and it is not associated with either the NCHP's 1919–1921 development. However, Powerhouse Road was used by City Light during the reconstruction of the powerhouse in 1967–1969 to transport equipment and materials to the powerhouse site. Powerhouse Road is estimated to have been constructed between 1958 and 1969. The road is not present in the 1958 USGS topographical map of the area and was first depicted in a 1969 City Light topographical map of the redeveloped NCPDC (USGS 1958; City Light 1969c). Archival City Light construction documents do not indicate that City Light constructed Powerhouse Road, and it predates the establishment of the RLNRA and NPS's federal jurisdiction in this area, suggesting Powerhouse Road was likely a logging road developed by USFS.

The 1969 alignment of Powerhouse Road ran east and southeast from Dam Access Road, across the Newhalem Creek Bridge over Newhalem Creek, and terminated at the powerhouse (City Light 1969c). Like Dam Access Road, Powerhouse Road appears to retain its original alignment, but was improved similarly with widening and graveling in the late 1980s and paved in the 1990s (USGS 1979, 1989; NETR 1984). However, this change only occurred within the Newhalem Creek Campground and remained unimproved along the remainder of its alignment east of the eastern Newhalem Creek Campground loop, suggesting that these improvements were undertaken by NPS within the vicinity of its facilities (NETR 1984, 1998; USGS 1989). No further changes to Powerhouse Road's design or materials have occurred since 1998. The road's surface material is well maintained and in good condition.

5.2.9.2 Historic Significance

NRHP Criterion A

The access roads have associations with 20th century developments in the area west of Newhalem Creek, including early 20th century USFS timbering activities and NPS's development of the Newhalem Campground and NCVC in the latter decades of the 20th century. Dam Access Road is referred to as an "old logging road" in the NPS's 1970 *North Cascades Master Plan* and Powerhouse Road was likely developed for USFS timbering activities in the area as well, given its estimated period of construction during USFS jurisdiction of the area (City Light 1992a:6-8–6-9; National Park Service Complex 1970:24). The two roads were also identified in 1969 as motor nature trails proposed by NPS for recreational developments in the newly established RLNRA (City of Seattle 1969:Exhibit R). While these individual components have associations with 20th century USFS and

NPS activities in their vicinity, they overall lack a cohesive period of development or documentation of development related to specific activities. Additionally, though the access roads facilitate vehicular and foot traffic to the headworks and powerhouse, these roads were not constructed by City Light as part of either the NCHP's 1919–1921 development or redevelopment in 1967–1970. While both were used during the 1967–1970 period to transport labor, equipment, and construction materials to the headworks and powerhouse sites, this is not sufficient to establish an association with City Light or the NCPDC. As such, the access roads are not considered significant under Criterion A, individually or as a contributor to the NCPDC and the SRNCHP (DT 66).

NRHP Criterion B

Available information related to the development of the access roads did not suggest any association with significant individuals associated with City Light, USFS, or NPS during those agency's respective periods of development at or within the vicinity of the NCHP. Furthermore, research provided no indication that any other individuals potentially associated with the access roads played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2021). As such, the access roads are not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

NRHP Criterion C

The access roads—Dam Access Road, constructed between 1919 and 1953, and Powerhouse Road, constructed between 1958 and 1968, were likely developed by USFS. The roads are common examples of remote road construction and share a common trend in their development. Constructed first as an unimproved dirt road and later improved with widening, and new surfacing materials, this is a common developmental trend for remote access roads redeveloped for other uses, such as recreation or forest management in USFS forest areas and does not conclusively represent design intent for specific purposes. As such, the access roads are not considered significant under Criterion C, individually or as a contributor to the NCPDC historic area and the SRNCHP (DT 66).

NRHP Criterion D

The access roads are common examples of remote roads that do not provide important information about the general trends in road construction or design that occurred in Washington during the 20th century that cannot be obtained through documentary sources. Therefore, the access roads have not yielded and are not likely to yield information important in prehistory or history. For this reason, the access roads cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Evaluation of Integrity

Each aspect of integrity is evaluated below.

- **Location.** The access roads retain integrity of location. Both Dam Access Road and Powerhouse Road remain in their approximate original locations with minimal alterations to their alignments.
- **Setting.** The access roads integrity of setting has been diminished by the construction of the Newhalem Creek Campground and NCVC. However, the access road's setting outside the

immediate vicinity of NPS facilities is consistent with the forested and mountainous environment of the two roads' respective periods of development.

- **Design.** The access roads retain integrity of design. The respective alignment of each road is the most important aspect of their design and do not appear to have been changed. Each road does appear to have been slightly widened in the 1980s, but this change in design is not substantial.
- **Materials.** The access roads' integrity of materials has been slightly diminished by changes in their respective surfacing materials. Each road has been partially paved in the vicinity of NPS facilities and is otherwise graveled. Though no documentation is available to suggest either road was originally surfaced with gravel or was simply dirt, the use of these different natural materials is a noted change but is not as severe as the roads' paving.
- **Workmanship.** The access roads' integrity of workmanship has been slightly diminished, corresponding to the noted minor changes to the two roads design and materials. However, the access roads were already limited in this aspect, originally constructed as simple roads cut through a remote forested area and lack design features that exemplify workmanship in road construction.
- **Feeling.** The access roads' integrity of feeling has been diminished by the construction of the Newhalem Creek Campground and NCVC, which intrude on the roads' otherwise remote and undeveloped setting. However, outside the immediate vicinity of NPS facilities the access roads reflect more fully their remote setting and simple construction.
- **Association.** The access roads' integrity of association has been diminished by its disconnection from the USFS since the establishment of the RLNRA in 1968 and the subsequent change in federal administration. However, the roads remain connected to State Route 20 via the Skagit River Bridge and are closely linked with the NPS facilities in their vicinity.

Overall, the access roads meet the majority of the seven aspects of integrity. The access roads retain integrity in location. The property's integrity of setting, design, and materials, workmanship, feeling, and association has been slightly diminished by minor alterations to the widths and materials of Dam Access Road and Powerhouse Road, as well as the development of the Newhalem Creek Campground and NCVC in their vicinity. However, in the absence of significance, regardless of physical condition, the access roads cannot be considered to have integrity that conveys significance under Criteria A, B, C, or D.

Eligibility Recommendations

Eligibility as a District Contributor to the SRNCHP (DT 66)

The access roads are not recommended as a contributor to the SRNCHP (DT 66) under Criteria A, B, or C. The access roads do not have significant historic associations with the NCHP's 1918–1921 development and 1967–1970 redevelopment, with J.D. Ross, or engineering significance related to either the 1921 or 1969 designs. Thus, in the absence of significance, regardless of physical condition, the access roads cannot be considered to have integrity that conveys individual significance under Criteria A, B, or C.

Individual NRHP Eligibility

The access roads do not have significant associations under Criteria A, B, C or D as discussed previously. Thus, in the absence of individual significance, regardless of physical condition, the

access roads cannot be considered to have integrity that conveys individual significance under Criteria A, B, C, or D. As such, the access roads are recommended not eligible for individual listing in the NRHP under any criteria.

Chapter 6
Effects Analysis

This chapter includes analysis of potential effects on historic properties from project activities. While none of the historic properties identified in the APE are recommended eligible for individual listing in the NRHP, six properties in the APE are recommended eligible for listing in the NRHP as contributors to the SRNCHP (DT 66) historic district. As such, this chapter assesses effects on the contributing properties in the APE, as well as effects on the SRNCHP (DT 66) historic district overall.

6.1 Effects Analysis for Historic Built Environment Resources Assumed Individually Eligible for the Purpose of the Study

6.1.1 Skagit/Newhalem – Quadraplex 101, 201, Fire Station

For the purposes of this study, the previously unevaluated Skagit/Newhalem – Quadraplex 101, 201, Fire Station is assumed to be individually eligible for listing in the NRHP. The property is in the APE on Cherry Blossom Lane in Newhalem, Washington.

6.1.1.1 Full Removal Alternative

Project activities proposed in the APE for the Full Removal Alternative in the vicinity of the property include the removal of the aboveground components of the transmission line. This will include the removal of the northern pole triplet arrangement of the Skagit River overhead crossing within 25 feet of the building and overhead line above the Skagit River.

No vibration effects from project activities for the Full Removal Alternative are expected to alter characteristics that qualify the property as individually eligible for listing in the NRHP. Transmission line removal activities would be performed in the vicinity of the Skagit/Newhalem – Quadraplex 101, 201, Fire Station. However, a vibration level of 0.20 inch per second peak particle velocity is associated with potential for building damage to non-engineered timber or masonry structures. Given the types of equipment associated with transmission line removal, it is unlikely that project activities would exceed this building damage threshold. For example, while a pile driver has a 1.5 inches per second peak particle velocity at 25 feet, a jackhammer has 0.035 inch per second peak particle velocity at 25 feet (FTA 2018).

No noise, fugitive dust, or traffic effects from construction of project activities are expected to alter characteristics that qualify the property as individually eligible for listing in the NRHP. In addition, the proposed project changes would not prohibitively alter access or use of the property. Though originally constructed as a multi-family residential building, a portion of the building has since been converted to be used as a fire station. The proposed removal of transmission line components in the vicinity would have no negative indirect impact on the viability of its current use for residential and municipal purposes. Furthermore, the aboveground components of the transmission line represent

a small fraction of aboveground electric distribution infrastructure in Newhalem, and the removal of these components would not detract from the property's setting in Newhalem.

Given the Full Removal Alternative would not substantially alter characteristics that qualify the property as individually eligible for listing in the NRHP, the overall integrity of the resource would not be diminished, and it would continue to be eligible for listing in the NRHP. As such, the Full Removal Alternative would have no adverse effect on Skagit/Newhalem – Quadraplex 101, 201, Fire Station.

6.1.1.2 Partial Removal Alternative (Preferred Alternative)

Project activities proposed in the APE for the Preferred Alternative in the vicinity of the property would be the same as the Full Removal Alternative. The effects from the Preferred Alternative would not substantially alter characteristics that qualify the property as individually eligible for listing in the NRHP, the overall integrity of the resource would not be diminished, and it would continue to be eligible for listing in the NRHP. As such, the Preferred Alternative would have no adverse effect on Skagit/Newhalem – Quadraplex 101, 201, Fire Station.

6.1.2 Skagit/Newhalem/Gorge – Suspension Bridge

For the purposes of this study, the previously unevaluated Skagit/Newhalem/Gorge – Suspension Bridge is assumed to be individually eligible for listing in the NRHP. The property is in the APE on Ladder Creek Lane in Newhalem.

6.1.2.1 Full Removal Alternative

Project activities proposed in the APE for the Full Removal Alternative and in the vicinity of the property include the removal of the aboveground components of the transmission line. This would include the removal of the transmission line conduit affixed to the south side of the bridge.

No vibration effects from project activities are expected to alter characteristics that qualify the property as individually eligible for listing in the NRHP. Transmission line removal activities would be performed along the length of the Skagit/Newhalem/Gorge – Suspension Bridge and in its vicinity. However, a vibration level of 0.20 inch per second peak particle velocity is associated with potential for building damage to non-engineered timber or masonry structures. Given the types of equipment associated with transmission line removal, it is unlikely that project activities would exceed this building damage threshold. For example, while a pile driver has a 1.5 inches per second peak particle velocity at 25 feet, a jackhammer has 0.035 inch per second peak particle velocity at 25 feet (FTA 2018).

No noise, fugitive dust, or traffic effects from construction of project activities are expected to alter characteristics that qualify the property as individually eligible for listing in the NRHP. In addition, the proposed project changes would not prohibitively alter access or use of the property. The removal of the transmission line conduit can be undertaken in a manner that avoids damage to the historic materials of the bridge and restores it to its pre-1965 condition. Thus, its direct impact on the integrity of this resource would be minimal. Furthermore, the removal activities would have no negative indirect impact on the viability of its current use as a bridge.

Given the Full Removal Alternative would not substantially alter characteristics that qualify the property as individually eligible for listing in the NRHP, the overall integrity of the resource would

not be diminished, and it would continue to be eligible for listing in the NRHP. As such, the project would have no adverse effect on Skagit/Newhalem/Gorge – Suspension Bridge.

6.1.2.2 Partial Removal Alternative (Preferred Alternative)

Project activities proposed in the APE for the Preferred Alternative in the vicinity of the property would be the same as the Full Removal Alternative. The effects from the Preferred Alternative would not substantially alter characteristics that qualify the property as individually eligible for listing in the NRHP, the overall integrity of the resource would not be diminished, and it would continue to be eligible for listing in the NRHP. As such, the Preferred Alternative would have no adverse effect on Skagit/Newhalem/Gorge – Suspension Bridge.

6.2 Effects Analysis for Historic Built Environment Resources Recommended Eligible as Historic District Contributors

6.2.1 Powerhouse (Map ID 1)

While this property is recommended not eligible for individual listing in the NRHP, it is a contributor to the SRNCHP (DT 66) historic district.

6.2.1.1 Full Removal Alternative

Project activities proposed in the APE for the Full Removal Alternative and in the vicinity of the property include the removal of the powerhouse, penstock, and aboveground components of the transmission line, including transformers and the southern pole triplet of the Skagit River overhead crossing. Project activities would alter the powerhouse's integrity of location, setting, design, materials, workmanship, feeling, and association.

Demolition of the powerhouse would prohibitively alter access and use of the property and would have a negative indirect impact on the viability of the property as a visible historic feature present along a recreational trail in the RLNRA.

Given that the Full Removal Alternative would demolish the powerhouse and thereby substantially alter characteristics that qualify the property as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would be lost, and it would no longer contribute to conveying the significance of the historic district. As such, the Full Removal Alternative would have an adverse effect on the powerhouse as a contributor to the SRNCHP (DT 66) historic district.

6.2.1.2 Partial Removal Alternative (Preferred Alternative)

Project activities proposed in the APE for the Preferred Alternative in the vicinity of the powerhouse would be limited to the removal of the aboveground components of the transmission line. This would include transformer removal within 25 feet of the building and removal of the southern pole triplet of the Skagit River overhead crossing less than 400 feet away from the building. For this alternative, City Light proposes to retain the powerhouse and has not proposed any other activities at the powerhouse. The removal of the aboveground components of the transmission line from the

viewshed of the powerhouse would represent a change to the property's setting and the removal of the headworks would represent a change to the property's association, as the design and use of this component relied on the NCPDC's preceding components. However, this diminishment of integrity of setting and association is not sufficiently substantial such that the powerhouse cannot continue to convey the significance of the NCPDC. Furthermore, neither transmission line removal nor headworks removal would alter the powerhouse's integrity of location, design, materials, workmanship, and feeling.

No vibration effects from project activities are expected to alter characteristics that qualify the property for inclusion in the NRHP as a contributor to the SRNCHP (DT 66) historic district. Transmission line removal activities would be performed in the vicinity of the powerhouse. However, a vibration level of 0.20 inch per second peak particle velocity is associated with potential for building damage to non-engineered timber or masonry structures. Given the types of equipment associated with transmission line removal, it is unlikely that project activities would exceed this building damage threshold. For example, while a pile driver has a 1.5 inches per second peak particle velocity at 25 feet, a jackhammer has 0.035 inch per second peak particle velocity at 25 feet (FTA 2018).

No noise, fugitive dust, or traffic effects from construction of project activities in the vicinity of this property are expected to alter characteristics that qualify the property for inclusion in the NRHP as a contributor to the SRNCHP (DT 66) historic district. In addition, the proposed project changes would not prohibitively alter access or use of the property. Since 2010, the powerhouse has been used inconsistently in accordance with its historic use as a power production facility. Instead, it has primarily been used as a site that interprets the historic significance of the NCHP in the RLNRA. The proposed decommissioning of the NCHP would permanently change its use but would have no negative indirect impact on the viability of its current preservation and use as an interpretive site.

Given the Preferred Alternative would not substantially alter characteristics that qualify the powerhouse as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would not be diminished, and it would continue to contribute to conveying the significance of the district. As such, the Preferred Alternative would have no adverse effect on powerhouse as a contributor to the SRNCHP (DT 66) historic district.

6.2.2 Headworks (Map ID 2)

While this property is recommended not eligible for individual listing in the NRHP, it is a contributor to the SRNCHP (DT 66) historic district.

6.2.2.1 Full Removal Alternative

Project activities proposed in the APE for the Full Removal Alternative and in the vicinity of this property include the demolition and removal of the headworks, including the diversion dam, sluiceway, intake, gatehouse, and footbridge. The dam would be removed first and would require construction of a cofferdam consisting of supersacks filled with creek materials upstream (southwest) of the headworks, and either the removal of only the dam with the apron retained, or the removal of both the dam and apron. After that, the sluiceway, intake, gatehouse, and associated concrete slabs on the north bank of Newhalem Creek would be removed, which would require the construction of a second cofferdam around these features along the north bank of Newhalem Creek. The rock shaft connecting the intake to the power tunnel would be filled with demolished concrete

from the removed components of the headworks. Additionally, removal of the headworks components would necessitate road improvements to Dam Access Road to provide access to its site, including the removal of a landslide and improvements to the road to the headworks. Project activities would alter the headworks' integrity of location, design, materials, workmanship, feeling, and association. However, project activities would not alter the powerhouse's integrity of setting.

Demolition of the headworks would prohibitively alter access and use of the property. Though access and use of the property is already restricted to City Light employees, project activities would have a negative indirect impact on the viability of the property as a visible historic feature present along a recreational trail in the RLNRA.

Given that the Full Removal Alternative would demolish the headworks and thereby substantially alter characteristics that qualify the property as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would be lost, and it would no longer contribute to conveying the significance of the historic district. As such, the Full Removal Alternative would have an adverse effect on the headworks as a contributor to the SRNCHP (DT 66) historic district.

6.2.2.2 Partial Removal Alternative (Preferred Alternative)

Project activities proposed in the APE for the Preferred Alternative in the vicinity of the property would be the same as the Full Removal Alternative. The effects from the Preferred Alternative would substantially alter characteristics that qualify the property as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would be lost, and it would no longer contribute to conveying the significance of the historic district. As such, the Preferred Alternative would have an adverse effect on the headworks as a contributor to the SRNCHP (DT 66) historic district.

6.2.3 Power Tunnel (Map ID 3)

While this property is recommended not eligible for individual listing in the NRHP, it is a contributor to the SRNCHP (DT 66) historic district.

6.2.3.1 Full Removal Alternative

Project activities proposed in the APE for the Full Removal Alternative and in the vicinity of this property include the abandonment in place of the power tunnel and the filling of the rock shaft connecting the intake to the power tunnel with demolished concrete from the removed components of the headworks. The filling of the rock shaft would alter the power tunnel's integrity of design, materials, and workmanship and the removal of the headworks would represent a change to the property's setting and association, and to a lesser extent feeling, as the design and use of this component relied on the NCPDC's preceding components.

No vibration effects from project activities are expected to alter characteristics that qualify the property for inclusion in the NRHP as a contributor to the SRNCHP (DT 66) historic district. While demolition of the headworks would be performed in the vicinity (within approximately 55–65 feet) of the power tunnel, a vibration level of 0.20 inch per second peak particle velocity is associated with potential for building damage to non-engineered timber or masonry structures. Given the types of equipment associated with demolition, it is unlikely that demolition activities to remove the headworks would exceed this building damage threshold. For example, while a pile driver has a 1.5 inches per second peak particle velocity at 25 feet, a jackhammer has 0.035 inch per second peak particle velocity at 25 feet (FTA 2018).

The proposed project changes would prohibit use of the property consistent with its historic function, as filling the adjacent rock shaft would render it unusable as water conveyance infrastructure. Given the subterranean nature of the power tunnel, access to the property is already extremely limited and restricted to City Light employees. While its northern terminus is publicly accessible, the power tunnel itself is not accessible due to the design of the penstock, which fills the power tunnel at that point. Nevertheless, the proposed decommissioning of the NCHP would permanently change its use. Thus, project activities would have a negative indirect impact on the viability of its historic use as water conveyance infrastructure but would not affect access to the property.

Given the Full Removal Alternative would substantially alter characteristics that qualify the power tunnel as a contributor to the potential SRNCHP (DT 66) historic district, the overall integrity of the resource would be diminished, and its ability to contribute to conveying the significance of the historic district would be undermined. As such, the Full Removal Alternative would have an adverse effect on the power tunnel as a contributor to the SRNCHP (DT 66) historic district.

6.2.3.2 Partial Removal Alternative (Preferred Alternative)

Project activities proposed in the APE for the Preferred Alternative in the vicinity of the property would be the same as the Full Removal Alternative. The effects from the Preferred Alternative would substantially alter characteristics that qualify the property as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would be lost, and it would no longer contribute to conveying the significance of the historic district. As such, the Preferred Alternative would have an adverse effect on the power tunnel as a contributor to the SRNCHP (DT 66) historic district.

6.2.4 Penstock (Map ID 4)

While this property is recommended not eligible for individual listing in the NRHP, it is a contributor to the SRNCHP (DT 66) historic district.

6.2.4.1 Full Removal Alternative

Project activities proposed in the APE for the Full Removal Alternative and in the vicinity of the property include the removal of the powerhouse, penstock, and aboveground components of the transmission line, including transformers and the southern pole triplet of the Skagit River overhead crossing. Project activities would alter the penstock's integrity of location, setting, design, materials, workmanship, feeling, and association.

Demolition of the penstock would prohibitively alter access and use of the property and would have a negative indirect impact on the viability of the property as a visible historic feature present along a recreational trail in the RLNRA.

Given that the Full Removal Alternative would demolish the penstock and thereby substantially alter characteristics that qualify the property as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would be lost, and it would no longer contribute to conveying the significance of the historic district. As such, the Full Removal Alternative would have an adverse effect on the penstock as a contributor to the SRNCHP (DT 66) historic district.

6.2.4.2 Partial Removal Alternative (Preferred Alternative)

Project activities proposed for the Preferred Alternative in the vicinity of this property would be limited to the removal of the aboveground components of the transmission line in the property's vicinity as it nears and enters the powerhouse. For this alternative City Light proposes to retain the penstock and has not proposed any other activities to occur at the penstock at this time. The removal of the aboveground components of the transmission line from the viewshed of the penstock would represent a change to the property's setting, and the removal of the headworks would represent a change to the property's association, as the design and use of this component relied on the NCPDC's preceding components. However, this limited diminishment of integrity of setting and association is not sufficiently substantial such that the penstock cannot convey its significant association with the NCPDC or the SRNCHP (DT66). Furthermore, neither transmission line removal nor headworks removal would alter the powerhouse's integrity of location, design, setting, materials, workmanship, and feeling.

No vibration effects from project activities are expected to alter characteristics that qualify the property for inclusion in the NRHP as a contributor to the SRNCHP (DT 66) historic district. While transmission line removal activities would be performed in the vicinity of the powerhouse, a vibration level of 0.20 inch per second peak particle velocity is associated with potential for building damage to non-engineered timber or masonry structures. Given the types of equipment associated with transmission line removal, it is unlikely that project activities would exceed this building damage threshold. For example, while a pile driver has a 1.5 inches per second peak particle velocity at 25 feet, a jackhammer has 0.035 inches per second peak particle velocity at 25 feet (FTA 2018).

No noise, fugitive dust, or traffic effects from construction of project activities in the vicinity of this property are expected to alter characteristics that qualify the property for inclusion in the NRHP as a contributor to the SRNCHP (DT 66) historic district. In addition, the proposed project changes would not prohibitively alter access to the property. Since 2010, the penstock has been used inconsistently in accordance with its historic use as water conveyance infrastructure. The proposed decommissioning of the NCHP would permanently change its use but would have no negative indirect impact on the viability of its current preservation and use as a visible historic feature present along a recreational trail in the RLNRA.

Given that the Preferred Alternative would not substantially alter characteristics that qualify the penstock as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would not be diminished, and it would continue to contribute to conveying the significance of the district. As such, the Preferred Alternative would have no adverse effect on the penstock as a contributor to the SRNCHP (DT 66) historic district.

6.2.5 Newhalem Creek Bridge (Map ID 7)

While this property is recommended not eligible for individual listing in the NRHP, it is a contributor to the SRNCHP (DT 66) historic district.

6.2.5.1 Full Removal Alternative

No project activities are proposed in the APE for the Full Removal Alternative in the vicinity of this property. For this alternative, Newhalem Creek Bridge will be retained and continue to facilitate vehicular access to the former powerhouse site on Powerhouse Road and foot traffic on the Linking

Trail. As such, Newhalem Creek Bridge's integrity of location, setting, design, materials, workmanship, feeling would not be altered. While, the Newhalem Creek Bridge's integrity of association would be diminished by the removal of the powerhouse, the loss of that property would not be sufficiently substantial such that the Newhalem Creek Bridge cannot continue to convey its significance as a contributor to the SRNCHP (DT 66) historic district.

No vibration noise, fugitive dust, or traffic effects from construction of project activities are expected to alter characteristics that qualify the property for inclusion in the NRHP as a contributor to the SRNCHP (DT 66) historic district.

Given that the Project would not substantially alter characteristics that qualify the Newhalem Creek Bridge as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would not be diminished, and it would continue to contribute to conveying the significance of the district. As such, the project would have no adverse effect on the Newhalem Creek Bridge as a contributor to the SRNCHP (DT 66) historic district.

6.2.5.2 Partial Removal Alternative (Preferred Alternative)

No project activities are proposed in the APE for the Preferred Alternative in the vicinity of this property. The Newhalem Creek Bridge will be retained and continue to facilitate vehicular access to the powerhouse on Powerhouse Road and foot traffic on the Linking Trail. As such, the Newhalem Creek Bridge's integrity of location, setting, design, materials, workmanship, feeling and association would not be altered.

No vibration noise, fugitive dust, or traffic effects from construction of project activities are expected to alter characteristics that qualify the property for inclusion in the NRHP as a contributor to the SRNCHP (DT 66) historic district.

Given the Preferred Alternative would not substantially alter characteristics that qualify the Newhalem Creek Bridge as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would not be diminished, and it would continue to contribute to conveying the significance of the district. As such, the Preferred Alternative would have no adverse effect on the Newhalem Creek Bridge as a contributor to the SRNCHP (DT 66) historic district.

6.2.6 Trail Network (Map ID 8)

While this property is recommended not eligible for individual listing in the NRHP, it is a contributor to the SRNCHP (DT 66) historic district.

6.2.6.1 Full Removal Alternative

Project activities proposed in the APE for the Full Removal Alternative and in the vicinity of the property include the removal of the powerhouse, penstock, and aboveground components of the transmission line, and the removal of the tailrace fish barrier. The removal of the powerhouse, penstock, and tailrace fish barrier would involve staging activities and the operation of machinery that could disturb potions of the trail network's components where they intersect with project activities. The removal of the penstock would involve the construction of a new access route and the operation of machinery in the immediate vicinity of the Tunnel Portal Trail—a component of the trail network—that could disturb portions of this trail. Project activities would alter the trail network's integrity of setting, feeling, and association, and have the potential to alter its integrity of

location, design, materials, workmanship, in the event project activities disturb portions of the trail network.

Vibration effects from project activities have the potential to alter characteristics that qualify the property for inclusion in the NRHP as a contributor to the SRNCHP (DT 66) historic district. The removal of the powerhouse, penstock, aboveground components of the transmission line, and fish barrier would occur in the immediate vicinity of the trail network. However, a vibration level of 0.20 inch per second peak particle velocity is associated with potential for building damage to non-engineered timber or masonry structures. Given the types of equipment associated with transmission line removal, it is unlikely that project activities would exceed this building damage threshold. For example, while a pile driver has a 1.5 inches per second peak particle velocity at 25 feet, a jackhammer has 0.035 inch per second peak particle velocity at 25 feet (FTA 2018).

No noise, fugitive dust, or traffic effects from construction of project activities in the vicinity of this property are expected to alter characteristics that qualify the property for inclusion in the NRHP as a contributor to the SRNCHP (DT 66) historic district. While the proposed project changes would not prohibitively alter access or use of the property, the Full Removal Alternative would have negative indirect impact on the viability of its current use as a recreational and interpretive trail as the powerhouse and penstock would no longer be present in its vicinity.

Given that the Full Removal Alternative would involve the demolition of properties with which the trail network is closely associated, alter its setting, and has the potential to physically alter the resource itself and thereby substantially alter characteristics that qualify the property as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would be lost, and it would no longer contribute to conveying the significance of the historic district. As such, the Full Removal Alternative would have an adverse effect on the trail network as a contributor to the SRNCHP (DT 66) historic district.

6.2.6.2 Partial Removal Alternative (Preferred Alternative)

Project activities proposed in the APE for the Preferred Alternative and in the vicinity of the trail network would be limited to the removal of the tailrace fish barrier within 50 feet one of its components, the Trail of the Cedars. The removal of the tailrace fish barrier from the viewshed of the trail network would represent a change to the property's setting. However, this reduction of integrity of setting is not sufficiently substantial such that the trail network cannot continue to convey its significance. Furthermore, the removal of the tailrace barrier would not alter the tailrace's integrity of location, design, materials, workmanship, feeling or association.

No vibration effects from project activities are expected to alter characteristics that qualify the property for inclusion in the NRHP as a contributor to the SRNCHP (DT 66) historic district. The removal of the tailrace fish barrier would be undertaken in the vicinity of the trail network. However, a vibration level of 0.20 inch per second peak particle velocity is associated with potential for building damage to non-engineered timber or masonry structures. Given the types of equipment associated with the fish barrier's removal, it is unlikely that project activities would exceed this building damage threshold. For example, while a pile driver has a 1.5 inches per second peak particle velocity at 25 feet, a jackhammer has 0.035 inch per second peak particle velocity at 25 feet (FTA 2018).

No noise, fugitive dust, or traffic effects from construction of project activities in the vicinity of this property are expected to alter characteristics that qualify the property for inclusion in the NRHP as a

contributor to the SRNCHP (DT 66) historic district. In addition, the proposed project changes would not prohibitively alter access or use of the property and would have no negative indirect impact on the viability of its current use as a recreational and interpretive trail.

Given the Preferred Alternative would not substantially alter characteristics that qualify the trail network as a contributor to the SRNCHP (DT 66) historic district, the overall integrity of the resource would not be diminished, and it would continue to contribute to conveying the significance of the district. As such, the Preferred Alternative would have no adverse effect on the trail network as a contributor to the SRNCHP (DT 66) historic district.

6.3 Effects Analysis for the Skagit River and Newhalem Creek Hydroelectric Project Historic District

The APE is within the boundary of the SRNCHP (DT 66) historic district, which includes the Newhalem Creek Powerhouse Site as a contributing resource. The recommended NCPDC and its contributing resources (the powerhouse, headworks, power tunnel, and penstock, Newhalem Creek Bridge, and trail network) are likewise within the boundary of the NRHP-listed SRNCHP (DT 66).

6.3.1.1 Full Removal Alternative

Project activities proposed in the APE for the Full Removal Alternative that would occur in the SRNCHP (DT 66) historic district include the removal of the powerhouse, penstock, headworks, the fish barrier—a component of the tailrace—and aboveground components of the transmission line; the abandonment of the power tunnel, components of the NCPDC's access roads at elevations greater than approximately 840 feet, and belowground components of the transmission line. The removal of the headworks would require additional construction activities, including road improvements to Dam Access Road—components of the non-contributing access roads—to provide access to the headworks site and the construction of two cofferdams on Newhalem Creek to facilitate the property's removal.

These project activities would represent permanent changes to a portion of the SRNCHP (DT 66) historic district and would diminish the integrity of location, setting, design, materials, workmanship, feeling, and association of the district. The removal of the powerhouse, penstock, and headworks would result in the loss of all visible components of the NCPDC and eliminate the ability of the NCPDC to convey its historic design and use, which was foundational to the development of the SRNCHP (DT 66).

While the removal of the aboveground portions of the transmission line in the vicinity of the powerhouse and in the district's Historic Area A, the Town of Newhalem, would likewise result in the loss of a recognizable representation of the NCPDC's function as a power production facility in that area, the impact of this activity on the district's integrity of setting would be limited. The aboveground components of the transmission line represent a small fraction of aboveground electric distribution infrastructure in the Town of Newhalem, and the removal of these components would not detract from the historic area's ability to convey its significance as the hub of City Light's electrical distribution network for the SRNCHP (DT 66). However, the removal activities related to the transmission line would contribute to the disconnection of the NCHP from the SRHP, minimally diminishing the district's overall integrity of association. The removal of the transmission line

conduit from the Skagit/Newhalem/Gorge Suspension Bridge is the only activity with the potential to physically affect a contributing resource to the SRNCHP (DT 66) because the conduit is affixed to the base of the bridge's southern side. However, the conduit is a component of a resource that is not eligible as a contributing resource to the district, and its removal could be undertaken in a manner that avoids damage to the historic materials of the bridge and restores it to its pre-1965 condition. Thus, its impact on the integrity of this resource and the district overall would be minimal.

The removal of the tailrace's non-historic fish barrier within the boundaries of the SRNCHP (DT 66) and vicinity would not alter a significant feature of the NCPDC or a contributing resource to the SRNCHP (DT 66) historic district. Moreover, noise, vibration, and fugitive dust associated with its demolition would not be sufficient to result in an adverse effect to the historic district as a whole.

These changes to contributing components of the SRNCHP (DT 66) historic district are substantial enough to diminish the integrity of location, setting, design, materials, workmanship, feeling and association for the district and undermine the ability of the district to convey its significance overall. Therefore, these changes would represent an adverse effect on the SRNCHP (DT 66) historic district.

6.3.1.2 Partial Removal Alternative (Preferred Alternative)

Project activities proposed in the APE for the Preferred Alternative that would occur in the SRNCHP (DT 66) historic district would be the same as under the Full Removal Alternative, except that the powerhouse and penstock would be retained and be interpreted as historic resources.

Project activities would represent permanent changes to a portion of the SRNCHP (DT 66) historic district and would diminish the integrity of location, setting, design, materials, workmanship, feeling, and association of the district. The removal of the headworks would result in the complete loss of the only visible component of the NCPDC on Newhalem Creek and substantially undermine the ability of the NCPDC to convey its historic design and use, which was foundational to the development of the SRNCHP (DT 66). The removal of this property would have a corresponding effect on the retained powerhouse and penstock as well because the design and use of these two components relied on the system's preceding components. However, as the two most accessible components of the NCPDC in the RLNRA, the powerhouse and penstock would continue to convey the significance of the NCPDC in the SRNCHP (DT 66) historic district through their preservation and as interpretive sites.

Activities that would be the same for the Preferred Alternative as the Full Removal Alternative in the in the vicinity of the powerhouse, in the district's Historic Area A, the Town of Newhalem, including the removal of the aboveground portions of the transmission line and the removal of the tailrace's non-historic fish barrier, would have the same limited impacts under Preferred Alternative. Likewise, noise, vibration, and fugitive dust associated with these activities would not be sufficient to result in an adverse effect to the historic district as a whole.

These changes to contributing components of the SRNCHP (DT 66) historic district are substantial enough to diminish the integrity of design, materials, workmanship, feeling and association for the district and undermine the ability of the district to convey its significance overall. However, these changes would not represent substantial alterations to the district's integrity of location or setting. Therefore, while the degree of adverse effect to the historic district under the Partial Removal Alternative (Preferred Alternative) would be less substantial than under the Full Removal Alternative, these changes would still represent an adverse effect on the SRNCHP (DT 66) historic district.

Chapter 7
Conclusions and Recommendations

7.1 Conclusions

The historic built environment resource survey evaluated nine resources in the APE that were not individually evaluated previously. This included the powerhouse, headworks (diversion dam/apron, sluice way/channel, intake and rock shaft, gatehouse, associated concrete slabs, and footbridge), power tunnel, penstock, tailrace, transmission line, Newhalem Creek Bridge, trail network (Trail of the Cedars and Tunnel Portal Trail), and access road (Dam Access Road and Powerhouse Road). None of these resources are recommended individually eligible. While the powerhouse, the headworks' diversion dam, power tunnel, and penstock were previously listed in the NRHP as contributors to the SRNCHP (DT 66) as part of Newhalem Creek Powerhouse Site, the historic built environment resource survey evaluated these resources, as well as the headworks, transmission line, tailrace, Newhalem Creek Bridge, trail network, and access roads as contributors to the SRNCHP (DT 66). Six of these resources—the powerhouse, headworks, power tunnel, penstock, Newhalem Creek Bridge, and trail network—are recommended eligible as contributors to the existing SRNCHP (DT 66) historic district. Furthermore, this study recommends the Newhalem Powerhouse Site be reconfigured into a new historic area in the SRNCHP (DT 66) historic district, the NCPDC, and an expansion of the historic district's period of significance from 1961 to 1970. In addition, two properties in the APE were assumed eligible for the purposes of conducting effects analysis for this study: the Skagit/Newhalem Quadraplex 101, 201, Fire Station and Skagit/Newhalem/Gorge – Suspension Bridge.

Project activities associated with the Full Removal Alternative would substantially affect the integrity of five properties recommended as contributors to the SRNCHP (DT 66)—the powerhouse, headworks, the power tunnel, penstock, and trail network. Therefore, the Full Removal Alternative would have an adverse effect on these properties and the SRNCHP (DT 66) historic district.

Project activities associated with the Preferred Alternative would affect the integrity of only two of the six properties recommended as contributors to the SRNCHP (DT 66) historic district—the headworks and the power tunnel—and, therefore, would have an adverse effect on these properties and the NRHP-listed SRNCHP (DT 66) historic district.

7.2 Recommendations

Based on the findings of the Historic Built Environment Survey and associated evaluations, no properties are recommended eligible for individual listing in the NRHP. The following properties are recommended not eligible for individual listing but are recommended eligible as contributors to the SRNCHP (DT 66) historic district: the powerhouse, headworks (diversion dam/apron, sluice way/channel, intake and rock shaft, gatehouse, associated concrete slabs, and footbridge), power tunnel, penstock, Newhalem Creek Bridge, and trail network (Trail of the Cedars and Tunnel Portal Trail).

The following properties are recommended not eligible for individual listing nor contributors to the SRNCHP (DT 66) historic district: the tailrace, transmission line, and access roads (Dam Access Road and Powerhouse Road).

The NCPDC is recommended as a new historic area within the SRNCHP (DT 66) historic district, significant under Criteria A, B, and C, with a period of significance of 1918–1970, ranging from the beginning of planning and construction of the NCPDC in 1918 to the year the redeveloped NCPDC began producing power.

Given project activities associated with either the Full Removal Alternative or Preferred Alternative would affect the integrity of properties that are recommended as contributors to the Skagit River and Newhalem Creek Hydroelectric Project (DT 66) historic district, undermining the overall ability of the historic district to convey its significance, these impacts represent an adverse effect on the contributing properties and the historic district. As such, a finding of "adverse effect" is recommended for this undertaking.

ICF recommends further consultation with DAHP, NPS, affected Tribes, or other affected parties to determine mitigation for impacts. Potential mitigation measures to resolve the finding of adverse effect may include, but may not be limited to revisiting the SRNCHP (DT 66) NRHP documentation to expand documentation and evaluation of the properties comprising the NCPDC; preparing an update to the existing Historic American Engineering Survey documentation for the NCPDC; or creating interpretive materials, in consultation with DAHP, affected Tribes, and NPS, related to the historic significances of the NCPDC, including but not limited to development and engineering of the NCPDC, to be displayed at the powerhouse and/or at former site of the headworks in the RLNRA. Interpretive materials may also include discussion of the NCPDC site history prior to construction of the hydroelectric facility, including traditional significance of this place to affected tribes.

Chapter 8
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Appendix A

Historic Property Inventory Forms

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Historic Property Report

Historic Name: Powerhouse

Property ID: 729310

Location

Address: Newhalem, Washington

Geographic Areas: T37R12E28, Whatcom County, DIABLO DAM Quadrangle

Information

Number of stories: N/A

Construction Dates:

Construction Type	Year	Circa
Built Date	1969	☐

Historic Use:

Category	Subcategory
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility

Historic Context:

Category

Architect/Engineer:

Category	Name or Company
Architect	William L. Freitas, City of Seattle, City Light Department
Engineer	City of Seattle, Department of City Light

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2021-08-05085, , Newhalem Creek Hydroelectric Project Decommissioning		Survey/Inventory	

Historic Property Report

Historic Name: Powerhouse

Property ID: 729310

Photos

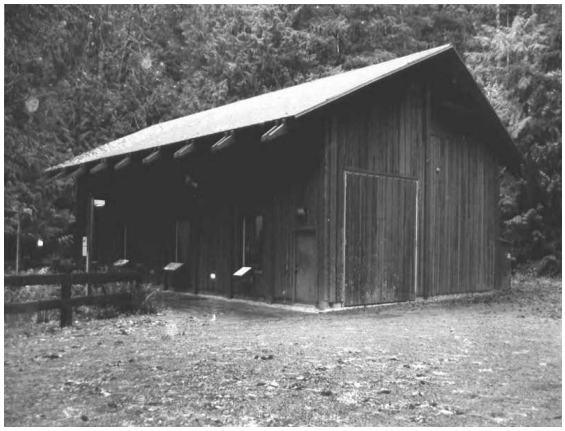
Powerhouse northwest corner in 2022, facing southeast.

Powerhouse after reconstruction in 1970, north and west facades facing southeast.

Powerhouse in 1987, north façade with east façade obliquely visible facing south.

Powerhouse northwest corner in 1990, facing southeast.

Powerhouse discharge chute flumes in 1990, facing west.



Powerhouse northwest corner in 2010, facing southeast.

Powerhouse northeast corner in 2022, facing southwest.

Powerhouse east façade in 2022, facing west.

Powerhouse southeast corner in 2022, facing northwest.

Powerhouse southwest corner in 2022, facing northeast.

Powerhouse interior in 2021, facing north.

Historic Property Report

Historic Name: Powerhouse

Property ID: 729310

Inventory Details - 9/26/2022

Common name:

Date recorded: 9/26/2022

Field Recorder: Corey Lentz; Will Linder; January Tavel

Field Site number:

SHPO Determination

Detail Information

Characteristics:

Category	Item
Foundation	Concrete - Poured
Form Type	Utilitarian
Roof Type	Gable - Side
Roof Material	Metal - Standing Seam
Cladding	Wood - Board & Batten
Structural System	Wood - Platform Frame
Plan	Rectangle

Surveyor Opinion

Property is located in a potential historic district (National and/or local): Yes

Property potentially contributes to a historic district (National and/or local): Yes

Significance narrative: This inventory recommends the Newhalem Creek Powerhouse and Dam Complex (NCPDC) powerhouse (hereafter referred to as the powerhouse), located near the town of Newhalem in Whatcom County, Washington, not eligible for individual listing in the NRHP under Criteria A, B, C, or D. However, the property is recommended eligible as a contributor to the Skagit River and Newhalem Creek Hydroelectric Projects (SRNCHP) (DT 66) under Criteria A and C. Supporting analysis is provided in the historic context, eligibility evaluation (significance analysis, integrity analysis, and eligibility recommendation statement), and physical description herein.

Historic Context

Prior to the development of the City of Seattle, City Light Department's (City Light) Skagit River Hydroelectric Project (SRHP), the upper Skagit River was a remote and rugged area in Whatcom County where Native American groups had lived for millennia. What eventually became the town of Newhalem was part of an extended Upper Skagit village system called k'wabacábš. Oral history and archaeological evidence indicate that the area around the powerhouse was important for hunting, gathering, and fishing (Mierendorf 1996). Euro-American miners began travelling upriver in the 1880s in search of gold, constructing rudimentary cabins at their claim sites. By the 1890s, a few homesteaders had settled along upper Skagit River in the vicinity of the future site of Newhalem to provision miners with supplies, but by the time City Light sought to develop

the area as a potential site of hydroelectric power in the 1910s, the upper Skagit River remained remote and sparsely populated by Euro-Americans. (Johnson 2010:8-2–8-4).

As part of the planning process for SRHP, City Light determined it needed a small temporary hydroelectric facility sited near the work camp and construction site. This facility, the Newhalem Creek Hydroelectric Project (NCHP), was constructed on Newhalem Creek, a tributary off the south side of the Skagit River southwest of present day Newhalem. The construction of the NCHP was a perquisite for the construction of first SRHP facility, the Gorge Powerhouse and Dam Complex (GPDC), as the plant would provide power to the construction camp that would serve as headquarters of the SRHP and would later become the town of Newhalem. The site of the NCPDC was surveyed and selected for the proposed temporary facility in the summer of 1918. (Johnson 2010:8-5).

Construction materials were transported from City Camp (now the Town of Newhalem) to the powerhouse Construction materials were transported from City Camp (present-day Town of Newhalem) to the powerhouse site using construction methods common to logging during the early 20th century. City Light constructed a cableway skidding system (also referred to as an overhead system) feeder from the railway on the north bank of the river to the powerhouse site, with which was a cableway skidding system (also referred to as an overhead system) used to move materials across the river just to the west of the suspension bridge (City Light 1919f, 1920a; Bryant 1923:504). This overhead system consisted of a set of two poles connected by a cross bar (referred to as a head spar tree) on each bank of the river, with the northern head spar tree additionally supported by a central strut (City Light 1920a; Bryant 1923:504). A cable ran between each head spar tree, with winches on either side to facilitate the movement of the traveler (the device that held materials) along the cable (City Light 1920a). This system remained in place just north of the suspension bridge through at least 1937 but was removed by the early 1950s (Figure 5) (City Light 1937 n.d.a.). After materials crossed the river, they were transported west to the powerhouse along the skid road. A skidder—a device powered by steam or electricity that operates on or near a railroad track, which moves materials by means of a cable—was installed on the hill to the east and behind the powerhouse to transport construction materials uphill from the powerhouse site to build the penstock (City Light 1920f; Bryant 1923:504).

The headworks site was accessed by a pedestrian trail, known as the Gatehouse Trail, which ascended the adjacent hillside on southwestern alignment from the powerhouse toward Newhalem Creek, and then proceeded west and south above and to the east of Newhalem creek (City Light 1920e). The alignment of the Gatehouse Trail was depicted in City Light's April of 1920 Drawing No. B-55 and again in the NCHP's 1969 FERC license application, though the trail was not explicitly identified in the latter (City Light 1920g). Construction materials for the 1921 headworks' timber crib dam and intake/gatehouse structure were sourced directly from the headworks site and surrounding area (City of Seattle 1969:Exhibit Q-1).

The NCPDC was completed in 1921, with power first produced in August of that year (Johnson 2010:7-44, 8-5). The 1921 NCPDC included a headworks on Newhalem Creek approximately one mile upstream from its confluence with the Skagit River, power tunnel, penstock, powerhouse, tailrace, and transmission line. The 1921 headworks' low log crib diversion dam that directed water into a vertical timber intake structure east of the dam connected to the power tunnel by a 55-foot-tall, 5-foot by 5-foot vertical rock shaft (City Light 1921a, 1921b, 2022a:1-1; Johnson 2010:8-5). From the intake, water flowed north–northwest underground through the 2,452 feet long bored power tunnel

(Johnson 2010:8-5; City Light 2022:1-1). Below ground, the power tunnel funneled water via a pipe intake bell surrounded by a concrete plug into the 925-foot penstock, of which 218 feet were located within the rock tunnel and the remaining 707 feet ran downhill to the powerhouse after daylighting from the rock tunnel (City Light 1919b; 2022:1-1; Johnson 2010:8-5). Along its descending alignment, the penstock was supported by U-shaped timber saddles, placed at regular short intervals between six thrust blocks (City Light 1919c). The penstock split as it entered the powerhouse to service each of the plant's Pelton Water Wheel Company (PWWC) double-nozzle impulse-type waterwheels, which powered a 2,000- kilovolt amperes (kVA) Westinghouse generator (City Light 1920c; Johnson 2010:8-5; Engineering World 1920:314). Water was discharged from the powerhouse into the tailrace, which ran north to the Skagit River (Roberts 1924:952; Johnson 2010:8-5). The original 1921 NCPDC powerhouse was a rustic wood framed building with board-and-batten siding, a corrugated metal roof, and a series of wood-sashed windows along its north façade (City Light 1919a). A 6600-volt aboveground transmission line transmitted power from the powerhouse, which ran northwest over the Skagit River to the rail line in Newhalem, and then northeast to the GPDC construction site (City Light 1921c).

The NCHP provided power to the buildings of the City Camp (later Newhalem), as well as the construction of both the Gorge power tunnel and powerhouse. These competing demands on the facility's limited capacity led to power shortages and delays in the construction of the GPDC (Johnson 2010:8-6). City Light initially intended the NCHP to be a temporary facility to facilitate the construction of the City Camp and the GPDC (Johnson 2010:8-5). However, the facility remained in operation following the completion of the GPDC in 1924, with its output then routed into the larger Skagit transmission and distribution network. In this new role as a local production and support facility, the NCHP provided power for the town of Newhalem and station service power for the Gorge Powerhouse's electrically operated equipment (e.g., heating, lighting and cooling). The NCHP was semi-automated in the early 1950s, allowing it to operate largely unmanned, with manual start-up and shut-down still required (Johnson 2010:8-5). City Light redeveloped the transmission line from the powerhouse to the Gorge Powerhouse in 1965, undergrounding most of the line within the town of Newhalem and rerouting it along the north bank of the Skagit River (City Light 1965a, 1965b).

A fire in July 1966 severely damaged the powerhouse. It burned down the building, but a flange gasket in one line of the bifurcated penstock behind the powerhouse blew out, creating a 60- to 70-foot-high sheet of water behind the powerhouse preventing fire damage in the surrounding wooded area. Additionally, the equipment within the powerhouse continued to run, saving the original PWWC turbines and Westinghouse generator from warping from the heat of the fire. (Johnson 2010:8-5). After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. In 1968 City Light replaced a log stringer bridge over Newhalem Creek on Powerhouse Road with the current Newhalem Creek Bridge to access the powerhouse from the west (City Light 1968a; City of Seattle 1969:Exhibit N).

The current powerhouse was constructed between 1967 and 1969 (Johnson 2010:7-44). The only major repair on the generating equipment was the rewinding of the Westinghouse generator and minor welding repair to the two PWWC turbines (Johnson 2010:8-5). The existing headworks on Newhalem Creek was also rebuilt during this period. The 1969 headworks consisted of a curved diversion dam and apron, rectangular sluice way/channel, intake and rock shaft, gatehouse, and associated concrete slabs

around the gatehouse; the 1969 headworks retained the existing log footbridge that crossed from the western bank access road to the gatehouse on the eastern bank (City Light 1969a, 1969b). The redeveloped NCHP retained and continued to utilize the original power tunnel, penstock, and tailrace, which required only minor maintenance and repairs following the fire. Before going back online in 1970, the NCHP was fully automated, the first of the Skagit River facilities to undergo the process, and remote control of the newly operational powerhouse equipment was established at the Gorge Powerhouse. (Johnson 2010:7-44, 8-5, 8-46; City Light 1971:11).

The NCHP was relicensed in 1997 and continued to operate until 2010 (City Light 1992, 2022c:A-5). The NCHP has not been consistently in service since 2010 due to an automatic gate valve requiring repairs. While equipment and structural issues resulting in the 2010 shutdown were eventually addressed, subsequent issues necessitated the current decommissioning of the NCHP. In 2015, a wildfire burned many of the original wooden penstock saddles, requiring an extensive replacement project in 2016-2017. More recently, leaks in the power tunnel, maintenance needs at the headworks and powerhouse, and access road safety concerns prohibit the continued operation of the NCHP. In 2021, City Light began the process of surrendering the facility's license (City Light 2022c:vi).

Skagit River and Newhalem Creek Hydroelectric Projects NRHP Listing

The SRNCHP (DT 66) was listed in the NRHP in 1996, with the nomination updated in 2010 (Erigero 1990; Johnson 2010). As of 2010, the SRNCHP (DT 66) is listed in the NRHP as significant at the national level under Criteria A, B, and C and has a period of significance of 1917–1961, beginning in the year the SRHP was first conceptualized by City Light and ending with the completion of the Gorge High Dam. The district is listed under Criterion A, in the area of Politics and Government, because it represents almost 50 years of American utility politics and development from the Progressive Era through the decades following World War II. The projects' development ensured the existence of City Light as a municipal utility and was immensely influential on the public power movement over the course of the 20th century. The district is listed under Criterion B, in the areas of Politics and Government, Entertainment/Recreation, and Landscape Architecture, for its association with J.D. Ross, City Light Superintendent for 28 years, and Ross's vision for City Light and public power, in particular hydroelectric power. Ross was instrumental in the projects' development, but also used the projects as a showcase to promote hydroelectric power and municipal utility ownership. The district is also listed under Criterion C, in the areas of Community Planning and Development, Engineering, Architecture, and Transportation for its representation of a general trend of developing more costly and remote hydroelectric sites in the 1920s and for its new and inventive engineering practices, both in the technical construction of the facilities themselves, as well as in the development of municipally owned towns (Newhalem and Diablo, Washington) and the transportation infrastructure required for their construction (Johnson 2010:8-1–8-2).

The historic district is three miles long and extends in a discontiguous linear manner along the north and south banks of, over and across the Skagit River within the Ross Lake National Recreation Area (RLNRA). Starting in Newhalem and extending east to Ross Dam, it includes the sequence of towns and industrial resources related to the SRNCHP (DT 66) and is grouped into seven discrete historic areas: Historic Area A – Town of Newhalem; Historic Area B – Gorge Powerhouse and Dam Complex; Historic Area C – Diablo Powerhouse Complex; Historic Area D Discontiguous Resources – Diablo Lake;

Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site; Historic Area E – Ross Powerhouse and Dam Complex; and Historic Area F – Hollywood Residential Area. The lakes formed by the dams are not included in the district. (Johnson 2010:7-2).

Property Development

The powerhouse is located on the south side of the Skagit River near the town of Newhalem in Whatcom County, Washington. It is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA, a subunit of the National Parks Service's (NPS) North Cascades National Park Service Complex. The powerhouse was planned and constructed from 1967–1969 and began producing power in 1970 (Johnson 2010:7-44, 8–5). The powerhouse was designed and constructed by City Light, with the design being attributed to City Light engineer William L. Freitas, and constructed by the W.H. Gregory Company. (Seattle Times 1975:37; City Light 1968b:27)

Original 1969 construction drawings for the existing powerhouse show a one story, wood-framed building with a rectangular plan, measuring approximately 56-feet by 30-feet. Its moderately pitched side-gable roof angled outward from its eaves to its peak on the east and west sides, was clad in hand-split cedar-shake, and had wide overhangs and open eaves. Decorative trapezoidal rafter tails extended out beyond the roof's overhang on its north and south sides, affixed to each of the roof beams that extended horizontally out from the building. The exterior of the powerhouse was clad in vertical cedar board-and-batten siding. The north and south facades of the building were divided into eight bays by nine regularly spaced embedded wood columns and its east and west facades were divided into two bays by a central embedded wood column. (City Light 1969c, 1969d)

The north façade featured three square fixed wood windows, located in the second, fourth, and six easternmost bays, each consisting of two rectangular panes. Additionally, a single-leaf access door was in the westernmost bay near the building's northwest corner. A pair of discharge chutes were located beneath the building and ran north from the center of the building, discharging spent water from the Pelton waterwheels into wooden flume that extended into the tailrace below the north façade's fourth and sixth easternmost bays. An elevated wood deck with an open wood rail ran along the north side of the building over these flumes, facilitating access between the building's east and west sides. The south façade's only feature was a single-leaf access door in the façade's second easternmost bay. On the building's south side, the penstock was bifurcated as it entered the powerhouse, its two metal pipes puncturing the exterior of the south façade at the base its fourth and sixth easternmost bays. The east façade was relatively featureless, with two projecting vent fans in the façade's southern bay and a pair of square vent windows beneath the gable peak, abutting the central column. The west facade contained a large double-leafed door that filled its northern bay, which was clad in vertical board-and-batten matching the rest of the building's exterior. Beneath the gable peak on the west façade's southern bay, a rectangular fixed wood vent window abutted the central embedded column. (City Light 1969c, 1969d)

Freitas designed the 1969 powerhouse to resemble the 1921 powerhouse at the request of NPS to preserve some of its historical value and be compatible with its forest setting in the RLNRA, replicating some of the original rustic design elements and the use of rough timber in its construction (City of Seattle 1969:27-28; City Light 1968b:27). Features of the 1969 design that evoke the original powerhouse included its simple, single-story,

side-gabled form and rectangular plan; its natural cedar board-and-batten siding; and fixed-wood windows. (City Light 1969e; City Light 1968b:27). However, the 1969 powerhouse differed from the 1921 design in its roof. While the 1921 building had a simple gabled roof clad in corrugated metal, the 1969 design used hand-split cedar shake for its roof cladding and featured exposed and stylized rafter ends (City Light 1919a, 1969 e). These material and decorative flourishes aligned more closely with the "rustic" architectural influences established by USFS and NPS during the 20th century and seen elsewhere in the SRNCHP (DT 66) and were requested by NPS to preserve some the facility's historical value and increase its compatibility with its forested environment (City of Seattle 1969:27-28). The powerhouse's interior consisted largely of a single open room, with a cluster of four small rooms located along its eastern exterior wall that housed a station battery room, storage area, bathroom, and office. Its interior walls were clad in vertical board. The powerhouse's generating equipment was located centrally within the open room, with the bifurcated penstock entering the building through its southern exterior wall to service its pair of PWWC turbines, between which was the Westinghouse generator. Associated generating equipment was located centrally along its western and northern walls, including the switchgear cubicles and exciter cabinets and an air compressor, hydraulic control panel, and auto transfer switch, respectively. (City Light 1969h: Electrical World 1922:139) These associated components were contemporaneous units, which replaced those installed in 1921 (City Light, 1968b:27). However, the location and layout of the 1969 powerhouse's engineered components appear to be the same as in the 1921 building, including the primary generating equipment and discharge chutes beneath the northern half of the building (City Light 1919a, 1969h).

Landscaping of the area around the powerhouse was completed circa 1973, with a curved retaining wall of large rocks placed along the hillside nineteen-and-a-half feet south of the powerhouse's southern exterior wall. Four light poles, consisting of wood posts and square wood light fixture casings were placed around the powerhouse, with one the east and west side of the powerhouse and two along the edge of the tailrace within its fencing on the north side of the building (City Light 1973).

Historic American Engineering Record (HAER) documentation was completed for the powerhouse in 1987 showing its north and east facades. At that time, the powerhouse appeared to be almost entirely unaltered since its construction. The only observable alteration made to the building between 1970 and 1987 was the installation of a small light fixture affixed to the north façade above the building's northwest access door. (City Light 1970; NPS 1987)

The powerhouse was next documented in 1990 as part of the NRHP documentation for the SRNCHP (DT 66). This documentation included photographs of the powerhouse showing its previously unphotographed west façade as well as its north façade. At this time, a small mechanical equipment box with matching vertical board-and-batten siding was partially visible on the south side of the building at its southwest corner (Erigero 1990: Photo 62). Additionally, metal grates had been installed over each discharge chute flume's lumber supports and a metal slide gate had been installed at the end of each flume to better control water flows out of the Powerhouse (Erigero 1990: Photo 64). Otherwise, no other alterations were observable in 1990.

In 2000, the wood deck on the north side of the powerhouse was removed and this area was enclosed, filled, and capped with concrete and the fencing around the new edge of the tailrace adjacent to the powerhouse was replaced (City Light 2000a, 2000b). The

discharge chute flumes were also replaced within an enclosed concrete structure at this time. However, it does not appear that any modifications were made to the discharge chutes beneath the powerhouse as part of that project (City Light 2000a, 2000b).

The powerhouse was again documented in 2010 as part of the revised NRHP documentation for the SRNCHP (DT 66). This documentation included photographs of the powerhouse showing its north and west facades. By 2010, the north façade window openings had been expanded and new larger rectangular wood fixed single pane windows had been installed, with metal interpretive signage affixed to the new windowsills and to the exterior of the façade's easternmost bay (Johnson 2010:File No. 4234). The alterations made to the powerhouse's windows and discharge chutes during this period were the outcome of recommendations for new interpretive exhibits at the powerhouse made in City Light's 1998 Historic Resources Mitigation and Management Plan related to the NCHP's licensing in 1997 (City Light 1998:26-27). Other alterations to the powerhouse between 1990 and 2010 include the replacement of its wood shingle roof cladding with standing-seam metal; and the installation of an electronic security pad adjacent to the north façade access door. (Johnson 2010:File No. 4234)

Previously undocumented features of the powerhouse identified in the current documentation include: the addition of fixed wood awnings over the vent windows located beneath the gable peak of the building's east and west facades; a small light fixture affixed to the building near the center of the east façade; a light fixture above the southeast access door matching the design of fixture documented above the northwest access door in 1987; a small wooden box above the bifurcated penstock, a separate metal hazard storage unit located just off the building's south side adjacent west of the access door, mechanical equipment meters affixed to the exterior near the southwest corner, and small metal City Light building identifier sign adjacent to the north access door.

National Register of Historic Places Eligibility Evaluation

Significance Analysis

National Register of Historic Places Criterion A

The powerhouse is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its association with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the NCHP for local power production for the town of Newhalem and as station service power backup for the Gorge Powerhouse (Johnson 2010:46). Due to a fire in 1966, it was necessary to reconstruct the powerhouse to continue operation of the NCHP; the headworks was also redeveloped during this period (Johnson 2010:8-5). The 1969 rustic design, a 1975 American Public Power Association honor award recipient, drew heavily from the 1920's vernacular powerhouse design through the adherence to the majority of the original footprint, the scale and massing, the application of similar building materials (wood), siding (board-and-batten) and the reuse of the original 1920s turbines and generator. The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5). In addition to serving as backup for the Gorge Powerhouse, the NCHP was the oldest operating hydroelectric plant within the SRNCHP (DT 66) until it ceased operations in 2010 (Johnson 2010:8-54). The powerhouse was partially automated in the early 1950s and was the first City Light facility within the SRNCHP (DT 66) to undergo full automation, with remote control of the facility fully transferred to the

Gorge Powerhouse in the early 1970s (Johnson 2010:8-46).

Given its significant historic associations with the initial hydroelectric development, design, and continued operations of the NCHP and the SRHP, the powerhouse is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66) historic district. However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and SRNCHP (DT 66).

National Register of Historic Places Criterion B

The powerhouse is not associated with any individuals that played a significant role in national, regional, or local history within the NCHP or the SRHP. At the time of the powerhouse's construction, City Light was led by Superintendent John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963-1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines within the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. Furthermore, research provided no indication that any other individuals potentially associated with the property played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2020). As such, the powerhouse is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

National Register of Historic Places Criterion C

Architecturally, the powerhouse was designed by City Light, with the design attributed to City Light civil engineer William L. Freitas and constructed by the W.H. Gregory Company. Freitas' 1969 design was meant to evoke the "rustic" design of the original 1921 powerhouse, exhibited through elements such as the building's single-story, rectangular, side-gabled form, similar footprint and orientation at the site, cedar board-and-batten siding, hand-split cedar-shake roof, exposed rafter ends, and fixed wood windows. While the powerhouse has been altered to expand its capacity as an interpretive subject and further protect the building and the 1921 power generation equipment, it retains sufficient integrity to convey its significance as an example of rustic architectural design adapted to a hydroelectric powerhouse. Additionally, though this particular design was recognized for its architectural and engineering merit, Freitas is not considered a master architect based on thresholds established by National Register Bulletin 15 (Seattle Times 1975:37; NPS 1995:20). The powerhouse is, thus, found to be a district contributor in architecture to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the powerhouse is not considered to be individually significant in architecture under Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

In addition to the building's architectural design, the powerhouse's engineering design was considered for potential significance. The powerhouse retains the NCPDC's original generating equipment—two PWWC double-nozzle impulse-type waterwheels and Westinghouse generator from 1921—and City Light construction drawings from 1921

and 1969 suggest the layout and location of this equipment and discharge chutes remained the same. The powerhouse, in reusing the 1921 PWWC turbines and Westinghouse generator, continued to function for what it was originally designed for—the generation of power within the NCHP and the SRHP for the construction of GPDC and providing power to the construction camp and the town of Newhalem. The powerhouse represents a critical component of the NCPDC's engineering infrastructure that ensured the NCHP's continued use and is, thus, considered an example of significant engineering from an early hydroelectric era that was determined still relevant when the 1969 reconstruction of the powerhouse took place to merit reuse. The powerhouse is, thus, found to be a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the powerhouse is not considered to be individually significant in engineering under Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

National Register of Historic Places Criterion D

The powerhouse is a common example of its architectural and engineering types that provides no important information about the general trends of hydroelectric powerhouse construction or design, or hydroelectric power generation that occurred in Washington during the 1960s and 1970s that cannot be obtained through documentary sources. Therefore, the powerhouse has not yielded and is not likely to yield information important in prehistory or history. For this reason, the powerhouse cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Integrity Analysis

Integrity is defined as the ability of a property to convey historic significance. The NRHP criteria recognizes seven aspects or qualities that, in various combinations, define integrity: location, setting, design, materials, workmanship, feeling, and association (NPS 1995:44):

The powerhouse retains integrity of location and setting. The building is in its original location, the former site of the 1921 powerhouse, and it remains isolated in a heavily forested area at the base of hillside on the south side of the Skagit River within a discrete grouping of hydroelectric components separate from the SRHP. It also retains some of its circa 1973 small-scale landscaping features, including several of the 1973 light posts and fixtures and the adjacent retaining wall, which appears intact and is substantially covered by vegetation. Alterations have been made to the immediate area over the years, among them: the installation of fencing in the vicinity of the powerhouse, improvements to the surrounding trail system, and the addition of small-scale features such as interpretive trail signage. However, these changes have had a limited impact on the powerhouse's setting.

The powerhouse's integrity of design, materials, and workmanship has been affected architecturally, and to a limited extent its engineering. The powerhouse's architectural integrity of design has been undermined by alterations to the powerhouse's exterior including: the enlargement of all three north façade window openings and the replacement of these windows, but which remained in the same locations; the installation of interpretive signage to the replacement windows' sills and to the building's exterior; the replacement of its wood-shingle roof with dark tan standing-seam

metal; the addition of the fixed-wood awnings over the east and west façade vent windows. Other minor alterations include the installation an electronic security pad by the doorway and signage on the north façade, and exterior light fixtures on the eastern and southern facades. However, the design of the building's roof, as well as its overall form, scale, size, plan, and massing has not changed since the 1969 design. The building continues to convey the majority of the materials used in the 1969 design, retaining its timber structural framework and board-and-batten cladding. Though the roof material has been changed, the low profile and dark color of the replacement metal cladding align with the 1969 rustic design intent. The workmanship of the powerhouse's architecture is expressed through its retained structural materials and exterior cladding. However, the loss of its hand-split cedar-shake roof and original windows has removed two features exemplifying the craftsmanship of the building's construction. The integrity of design, materials, and workmanship of the powerhouse's engineered components has been affected by alterations to the timber extensions of its discharge chutes, which retained their location, general dimensions, and function, but were replaced with an enclosed concrete structure. However, the powerhouse does retain the NCHP's 1921 power generating equipment, employed in the 1969 powerhouse after its construction, which have remained in the same configuration as both the 1921 and 1969 powerhouse.

The powerhouse's integrity of feeling has been slightly affected by alterations to its architectural and engineered features. Although alterations to its roof, windows, and the discharge chutes have changed the appearance of the structure, the overall architectural aesthetic of a 1969 rustic inspired design in a forested environment is still present. The building's form, footprint, layout, visual cues and audible environment, circulation pathways around it traversing through and within a forested environment remain relatively unchanged. Its key engineered components—the 1921 generating equipment and obscured portions of the discharge chutes—remain largely intact. Overall, the property remains generally recognizable to its 1969 construction period. The building retains integrity of association, as it was constructed at the site of the 1921 NCPDC powerhouse built as part of the NCHP that supplied power for the construction of the GPDC and the growing workcamps that eventually became the town of Newhalem, then through the destructive fire in 1966 and the reuse of the original 1921 generating equipment within the reconstructed 1969 powerhouse, to its final year of operation in 2010. The addition of interpretive elements over the last two decades further communicates its historic associations with the SRNCHP (DT 66) and City Light.

Overall, the powerhouse meets the majority of the seven aspects of integrity. It retains integrity in location, setting, and association. While alterations to its architectural and engineered features have affected its integrity in design, materials, workmanship, and feeling, the powerhouse retains sufficient overall integrity to convey its significance under Criteria A and C as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendation

Eligibility as a District Contributor

The powerhouse is within the boundaries of the SRNCHP (DT 66) historic district, which was listed in the NRHP in 1996 (updated in 2010) under Criteria A, B, and C with a period of significance of 1917–1961. The powerhouse was previously identified as a component to the Newhalem Creek Powerhouse Site, which was listed in the NRHP as a contributing resource to the SRNCHP (DT 66) in the district's Historic Area D, Single Non-Contiguous Resources (Erigero 1990:7-4; Johnson 2010:7-82).

This study reconsiders the Newhalem Powerhouse Site as a new historic area in the SRNCHP (DT 66) district, the Newhalem Creek Powerhouse and Dam Complex, with an expanded period of significance of 1918–1970, beginning with the planning and construction of the NCHP and ending with the year the reconstructed NCHP began producing power. The powerhouse is recommended eligible for listing in the NRHP as a contributor to the SRNCHP (DT 66) under Criteria A and C, in the newly recommended historic area.

The powerhouse is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as a support facility for the Gorge Powerhouse. The reconstruction of the powerhouse and headworks redevelopment following the 1966 fire represented City Light's commitment to the continued operation of the NCHP, with power production resuming in 1970. Until it ceased production in 2010, the NCHP was the oldest operating hydroelectric facility in the Skagit River area, and the first to undergo full automation. The powerhouse retains integrity to convey this significance under Criterion A during the 1969–1970 period, the date of the property's completion to the year the redeveloped NCHP began producing power.

The powerhouse is not recommended as a contributor to the SRNCHP (DT 66) under Criterion B. The district is listed in the NRHP under Criterion B for its significant association with J.D. Ross, the Superintendent of City Light from 1911–1939 who was involved substantially in the planning and construction of the SRHP and NCHP. As the powerhouse was constructed well after 1939, the property does not share this association with Ross.

The powerhouse is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion C as an example of rustic architecture adapted to a hydroelectric powerhouse and as one component of the cohesive and intact collection of engineered components that comprise the NCPDC. Freitas' 1969 design intended to evoked the rustic design of the 1921 powerhouse, exemplified by its overall form, plan, and orientation at the site and the use of wood in its structural materials, exterior cladding, original roof material, and decorative elements. The necessary and substantial improvements made in 1969 to the original engineering of the NCPDC, including the reconstruction of the powerhouse, ensured the facilities continued operation and secured an increased and better regulated source of water for hydroelectric production. The powerhouse retains integrity to convey its architectural and engineering significance under Criterion C as part of the redevelopment of NCHP in 1969.

Individual NRHP Eligibility

The powerhouse is significant under Criterion A and retains integrity to convey this significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the powerhouse alone. Thus, in the absence of individual significance, regardless of physical condition, the powerhouse cannot be considered to have integrity that conveys individual significance under Criterion A. As such, the powerhouse is recommended not eligible for individual listing in the NRHP under Criterion A.

The powerhouse is significant under Criterion C and retains integrity to convey this

significance, as discussed previously. However, the significance of its architecture and engineering is derived from its context within the redeveloped NCHP's design and function in 1969 that cannot be represented solely by the powerhouse. Thus, in the absence of individual significance, regardless of physical condition, the powerhouse cannot be considered to have integrity that conveys individual significance under Criterion C. As such, the powerhouse is recommended not eligible for individual listing in the NRHP under Criterion C.

Without meaningful connection to an individual important to history, and unable to yield information important to prehistory or history, the powerhouse cannot be considered to have individual significance under Criteria B or D. Thus, in the absence of individual significance, regardless of physical condition, the powerhouse cannot be considered to have integrity that conveys individual significance under Criteria B or D. As such, the powerhouse is recommended not eligible for individual listing in the NRHP under Criteria B or D.

Physical description:

The powerhouse is a one-and-a-half story, wood-framed building with a rectangular plan and moderately pitched side-gable roof that angles outward from its eaves to its peak on the east and west sides. The building's roof is clad in standing-seam metal and has wide overhangs with boxed eaves. Decorative trapezoidal rafter tails extend out beyond the roof's overhang on its north and south sides. The exterior of the powerhouse is clad in vertical board-and-batten siding. The north and south facades of the building are divided into eight bays by nine regularly spaced embedded wood columns and its east and west facades are divided into two bays by three regularly spaced embedded wood columns.

The north façade features three large rectangular wood fixed single pane windows, located in the second, fourth, and six easternmost bays. A single-leaf access door is in the westernmost bay near the building's northwest corner with a small light fixture affixed above. Additionally, metal interpretive signage is affixed to the windowsills and to the exterior of the façade's easternmost bay, and an electronic security pad and a small metal City Light building identifier sign are affixed to the exterior adjacent to the access door. Features of the east façade include two rectangular fixed wood vent windows with fixed wood awnings beneath the gable peak, two projecting vent fans on the façade's southern bay, and a small light fixture near the center of the façade. The west façade's primary feature is a large double-leafed door in the façade's northern bay, clad in vertical board-and-batten matching the rest of the building's exterior. A rectangular fixed wood vent window and fixed awning matching the two on the east façade are in the façade's southern bay beneath the gable peak. The south façade features a single-leaf access door in the easternmost bay near the building's southeast corner with a light fixture matching the fixture on the north façade affixed above. The bifurcated penstock enters the building near the center of the base of the south façade. Other features of the south façade include several mechanical equipment boxes and meters and a separate metal hazard storage unit just off the building's south side adjacent west of the access door.

Alterations to the powerhouse include the expansion of its north façade window openings and the installation of windows of a different design; installation of interpretive signage to the replacement windows and the building's exterior; replacement of its wood shingle roof with standing-seam metal; removal of the elevated decking on the north side of the building the replacement of the discharge chute lumber flumes with a concrete box structure that was then covered; the addition of the fixed wood awnings over the gable peak vent windows; and the installation of minor features such as the north façade electronic security pad and signage, and exterior light fixtures on the north, south, and east facades. The powerhouse is in good condition.

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Historic Property Report

Historic Name: Headworks

Property ID: 729311

Location

Address: Newhalem, Washington

Geographic Areas: DIABLO DAM Quadrangle, T37R12E28, Whatcom County

Information

Number of stories: N/A

Construction Dates:

Construction Type	Year	Circa
Built Date	1969	☐

Historic Use:

Category	Subcategory
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility

Historic Context:

Category

Architect/Engineer:

Category	Name or Company
Engineer	City of Seattle, Department of City Light

Historic Property Report

Historic Name: Headworks

Property ID: 729311

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2021-08-05085, , Newhalem Creek Hydroelectric Project Decommissioning		Survey/Inventory	

Photos

Headworks in 2022, facing northeast from upstream.

Headworks in 1971, facing east.

Headworks, facing northeast from upstream.

Headworks, sluiceway in 1987, facing south.

Headworks in 2010, facing northeast.

Headworks in 2022, division dam facing south.

Historic Property Report

Historic Name: Headworks

Property ID: 729311

Headworks in 2022, apron facing southeast.

Headworks in 2022, sluiceway facing southeast.

Headworks in 2022, gatehouse facing east.

Headworks in 2022, footbridge facing east.

Headworks in 2022 associated concrete slabs, facing northwest.

NCHP 1921 intake and gatehouse in 1968 after 1966 fire, facing east.

Historic Property Report

Historic Name: Headworks Property ID: 729311

Inventory Details - 9/26/2022

Common name:

Date recorded: 9/26/2022

Field Recorder: Corey Lentz; Will Linder; January Tavel

Field Site number:

SHPO Determination

Detail Information

Characteristics:

Category	Item
Foundation	Concrete - Poured

Surveyor Opinion

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): Yes

Property potentially contributes to a historic district (National and/or local): Yes

Significance narrative: This inventory recommends the Newhalem Creek Powerhouse and Dam Complex (NCPDC) headworks (hereafter referred to as the headworks), located near the town of Newhalem in Whatcom County, Washington, not eligible for individual listing in the NRHP under Criteria A, B, C, or D. However, the property is recommended eligible as a contributor to the Skagit River and Newhalem Creek Hydroelectric Projects (SRNCHP) (DT 66) under Criteria A and C. Supporting analysis is provided in the historic context, eligibility evaluation (significance analysis, integrity analysis, and eligibility recommendation statement), and physical description herein.

Historic Context

Prior to the development of the City of Seattle, City Light Department's (City Light) Skagit River Hydroelectric Project (SRHP), the upper Skagit River was a remote and rugged area in Whatcom County where Native American groups had lived for millennia. What eventually became the town of Newhalem was part of an extended Upper Skagit village system called k'wabacábš. Oral history and archaeological evidence indicate that the area around the powerhouse was important for hunting, gathering, and fishing (Mierendorf 1996). Euro-American miners began travelling upriver in the 1880s in search of gold, constructing rudimentary cabins at their claim sites. By the 1890s, a few homesteaders had settled along upper Skagit River in the vicinity of the future site of Newhalem to provision miners with supplies, but by the time City Light sought to develop the area as a potential site of hydroelectric power in the 1910s, the upper Skagit River remained remote and sparsely populated by Euro-Americans. (Johnson 2010:8-2–8-4).

As part of the planning process for SRHP, City Light determined it needed a small temporary hydroelectric facility sited near the work camp and construction site. This facility, the Newhalem Creek Hydroelectric Project (NCHP), was constructed on Newhalem Creek, a tributary off the south side of the Skagit River southwest of present day Newhalem. The construction of the NCHP was a perquisite for the construction of

first SRHP facility, the Gorge Powerhouse and Dam Complex (GPDC), as the plant would provide power to the construction camp that would serve as headquarters of the SRHP and would later become the town of Newhalem. The site of the NCPDC was surveyed and selected for the proposed temporary facility in the summer of 1918. (Johnson 2010:8-5).

Construction materials were transported from City Camp (now the Town of Newhalem) to the powerhouse Construction materials were transported from City Camp (present-day Town of Newhalem) to the powerhouse site using construction methods common to logging during the early 20th century. City Light constructed a cableway skidding system (also referred to as an overhead system) feeder from the railway on the north bank of the river to the powerhouse site, with which was a cableway skidding system (also referred to as an overhead system) used to move materials across the river just to the west of the suspension bridge (City Light 1919f, 1920a; Bryant 1923:504). This overhead system consisted of a set of two poles connected by a cross bar (referred to as a head spar tree) on each bank of the river, with the northern head spar tree additionally supported by a central strut (City Light 1920a; Bryant 1923:504). A cable ran between each head spar tree, with winches on either side to facilitate the movement of the traveler (the device that held materials) along the cable (City Light 1920a). This system remained in place just north of the suspension bridge through at least 1937 but was removed by the early 1950s (Figure 5) (City Light 1937 n.d.a.). After materials crossed the river, they were transported west to the powerhouse along the skid road. A skidder—a device powered by steam or electricity that operates on or near a railroad track, which moves materials by means of a cable—was installed on the hill to the east and behind the powerhouse to transport construction materials uphill from the powerhouse site to build the penstock (City Light 1920f; Bryant 1923:504).

The headworks site was accessed by a pedestrian trail, known as the Gatehouse Trail, which ascended the adjacent hillside on southwestern alignment from the powerhouse toward Newhalem Creek, and then proceeded west and south above and to the east of Newhalem creek (City Light 1920e). The alignment of the Gatehouse Trail was depicted in City Light's April of 1920 Drawing No. B-55 and again in the NCHP's 1969 FERC license application, though the trail was not explicitly identified in the latter (City Light 1920g). Construction materials for the 1921 headworks' timber crib dam and intake/gatehouse structure were sourced directly from the headworks site and surrounding area (City of Seattle 1969:Exhibit Q-1).

The NCPDC was completed in 1921, with power first produced in August of that year (Johnson 2010:7-44, 8-5). The 1921 NCPDC included a headworks on Newhalem Creek approximately one mile upstream from its confluence with the Skagit River, power tunnel, penstock, powerhouse, tailrace, and transmission line. The 1921 headworks' low log crib diversion dam that directed water into a vertical timber intake structure east of the dam connected to the power tunnel by a 55-foot-tall, 5-foot by 5-foot vertical rock shaft (City Light 1921a, 1921b, 2022:1-1; Johnson 2010:8-5). From the intake, water flowed north–northwest underground through the 2,452 feet long bored power tunnel (Johnson 2010:8-5; City Light 2022:1-1). Below ground, the power tunnel funneled water via a pipe intake bell surrounded by a concrete plug into the 925-foot penstock, of which 218 feet were located within the rock tunnel and the remaining 707 feet ran downhill to the powerhouse after daylighting from the rock tunnel (City Light 1919b; 2022:1-1; Johnson 2010:8-5). Along its descending alignment, the penstock was supported by U-shaped timber saddles, placed at regular short intervals between six thrust blocks (City Light 1920c). The penstock split as it entered the powerhouse to service each of the plant's Pelton Water Wheel Company (PWWC) double-nozzle impulse-type waterwheels,

which powered a 2,000- kilovolt amperes (kVA) Westinghouse generator (City Light 1920c; Johnson 2010:8-5; Engineering World 1920:314). Water was discharged from the powerhouse into the tailrace, which ran north to the Skagit River (Roberts 1924:952; Johnson 2010:8-5). The original 1921 NCPDC powerhouse was a rustic wood framed building with board-and-batten siding, a corrugated metal roof, and a series of wood-sashed windows along its north façade (City Light 1919a). A 6600-volt aboveground transmission line transmitted power from the powerhouse, which ran northwest over the Skagit River to the rail line in Newhalem, and then northeast to the GPDC construction site (City Light 1921c).

The NCHP provided power to the buildings of the City Camp (later Newhalem), as well as the construction of both the Gorge power tunnel and powerhouse. These competing demands on the facility's limited capacity led to power shortages and delays in the construction of the GPDC (Johnson 2010:8-6). City Light initially intended the NCHP to be a temporary facility to facilitate the construction of the City Camp and the GPDC (Johnson 2010:8-5). However, the facility remained in operation following the completion of the GPDC in 1924, with its output then routed into the larger Skagit transmission and distribution network. In this new role as a local production and support facility, the NCHP provided power for the town of Newhalem and station service power for the Gorge Powerhouse's electrically operated equipment (e.g., heating, lighting and cooling). The NCHP was semi-automated in the early 1950s, allowing it to operate largely unmanned, with manual start-up and shut-down still required (Johnson 2010:8-5). City Light redeveloped the transmission line from the powerhouse to the Gorge Powerhouse in 1965, undergrounding most of the line within the town of Newhalem and rerouting it along the north bank of the Skagit River (City Light 1965a, 1965b).

A fire in July 1966 severely damaged the powerhouse. It burned down the building, but a flange gasket in one line of the bifurcated penstock behind the powerhouse blew out, creating a 60- to 70-foot-high sheet of water behind the powerhouse preventing fire damage in the surrounding wooded area. Additionally, the equipment within the powerhouse continued to run, saving the original PWWC turbines and Westinghouse generator from warping from the heat of the fire. (Johnson 2010:8-5). After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. In 1968 City Light replaced a log stringer bridge over Newhalem Creek on Powerhouse Road with the current Newhalem Creek Bridge to access the powerhouse from the west (City Light 1968; City of Seattle 1969:Exhibit N).

The current powerhouse was constructed between 1967 and 1969 (Johnson 2010:7-44). The only major repair on the generating equipment was the rewinding of the Westinghouse generator and minor welding repair to the two PWWC turbines (Johnson 2010:8-5). The existing headworks on Newhalem Creek was also rebuilt during this period. The 1969 headworks consisted of a curved diversion dam and apron, rectangular sluice way/channel, intake and rock shaft, gatehouse, and associated concrete slabs around the gatehouse; the 1969 headworks retained the existing log footbridge that crossed from the western bank access road to the gatehouse on the eastern bank (City Light 1969a, 1969b). The redeveloped NCHP retained and continued to utilize the original power tunnel, penstock, and tailrace, the latter two of which required only minor maintenance and repairs following the fire. Before going back online in 1970, the NCHP was fully automated, the first of the Skagit River facilities to undergo the process, and remote control of the newly operational powerhouse equipment was established at the Gorge Powerhouse. (Johnson 2010:7-44, 8-5, 8-46; City Light 1971a:11).

The NCHP was relicensed in 1992 1997 and continued to operate until 2010 (City Light 1992, 2022c:A-5). The NCHP has not been consistently in service since 2010 due to an automatic gate valve requiring repairs. While equipment and structural issues resulting in the 2010 shutdown were eventually addressed, subsequent issues necessitated the current decommissioning of the NCHP. In 2015, a wildfire burned many of the original wooden penstock saddles, requiring an extensive replacement project in 2016-2017. More recently, leaks in the power tunnel, maintenance needs at the headworks and powerhouse, and access road safety concerns prohibit the continued operation of the NCHP. In 2021, City Light began the process of surrendering the facility's license (City Light 2022c:vi).

Skagit River and Newhalem Creek Hydroelectric Projects NRHP Listing

The SRNCHP (DT 66) was listed in the NRHP in 1996, with the nomination updated in 2010 (Erigero 1990; Johnson 2010). As of 2010, the SRNCHP (DT 66) is listed in the NRHP as significant at the national level under Criteria A, B, and C and has a period of significance of 1917–1961, beginning in the year the SRHP was first conceptualized by City Light and ending with the completion of the Gorge High Dam. The district is listed under Criterion A, in the area of Politics and Government, because it represents almost 50 years of American utility politics and development from the Progressive Era through the decades following World War II. The projects' development ensured the existence of City Light as a municipal utility and was immensely influential on the public power movement over the course of the 20th century. The district is listed under Criterion B, in the areas of Politics and Government, Entertainment/Recreation, and Landscape Architecture, for its association with J.D. Ross, City Light Superintendent for 28 years, and Ross's vision for City Light and public power, in particular hydroelectric power. Ross was instrumental in the projects' development, but also used the projects as a showcase to promote hydroelectric power and municipal utility ownership. The district is also listed under Criterion C, in the areas of Community Planning and Development, Engineering, Architecture, and Transportation for its representation of a general trend of developing more costly and remote hydroelectric sites in the 1920s and for its new and inventive engineering practices, both in the technical construction of the facilities themselves, as well as in the development of municipally owned towns (Newhalem and Diablo, Washington) and the transportation infrastructure required for their construction (Johnson 2010:8-1–8-2).

The historic district is three miles long and extends in a discontiguous linear manner along the north and south banks of, over and across the Skagit River within the Ross Lake National Recreation Area (RLNRA). Starting in Newhalem and extending east to Ross Dam, it includes the sequence of towns and industrial resources related to the SRNCHP (DT 66) and is grouped into seven discrete historic areas: Historic Area A – Town of Newhalem; Historic Area B – Gorge Powerhouse and Dam Complex; Historic Area C – Diablo Powerhouse Complex; Historic Area D Discontiguous Resources – Diablo Lake; Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site; Historic Area E – Ross Powerhouse and Dam Complex; and Historic Area F – Hollywood Residential Area. The lakes formed by the dams are not included in the district. (Johnson 2010:7-2).

Property Development

The headworks is located on the south side of the Skagit River near Newhalem in

Whatcom County, Washington. It is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA, a subunit of the National Parks Service (NPS) North Cascades National Park Service Complex. The headworks was planned and constructed in 1967-1969. The headworks was designed by City Light, though available documentation does not specify the engineer or contractor responsible for its construction (Johnson 2010:7-44).

City Light used Dam Access Road to transport construction materials and heavy machinery for site excavation to the headworks site and built coffer dams to alter the flow Newhalem Creek during construction (City Light 1969d). The 1921 log crib diversion dam had been washed out and was removed. The intake structure and timber shelter were also removed and rebuilt as part of the new headworks (City of Seattle 1969:Exhibit S). The 1969 headworks consisted of a diversion dam and apron, sluice channel, intake, gatehouse, footbridge, and associated concrete slabs around gatehouse. The concrete curved diversion dam was 9-feet high, 47-feet wide, and 4.5-feet thick and had three conical metal nappe splitters spaced evenly along its crest. The dam's downstream (north) concrete apron was likewise conical with a generally rectangular extension off its northern end along the eastern bank of Newhalem Creek. The rectangular sluice channel, or sluiceway, was located at the east side of the diversion dam. Predominantly constructed of concrete, the sluice channel had four openings, three on the upstream (south) side of the dam, located on the sluice channel's west side and south end, and one on its west side at its north end downstream of the dam. These openings were slotted to fit two bulkheads, a gravel stop, and a weir, respectively, all constructed of timber. These timber features could be removed to regulate waterflows through the sluice channel dependent on water levels. A hoist gate structure was located at the sluice channel's north end, consisting of a trapezoidal concrete structure topped with metal grates with the hoist gate on its south side. This gate could be opened to direct surging water out over the apron extension, rather directly on to the apron. A trashrack, consisting of a large rectangular metal grate, was located along the east side of the sluice channel. Water flowed through the trashrack from the sluice channel into the trapezoidal intake, which narrowed at its east side into a rectangular space connected to a 55-foot vertical rock shaft to the power tunnel. The intake was divided into sections by slide gates to control water flows. (City Light 1969a, 1969b; Johnson 2010:7-44).

A gatehouse was located above the intake on the eastern bank of Newhalem Creek. The gatehouse was a small square structure that mimicked the design elements of the powerhouse, such as its simple, single-story, side-gabled form, its natural cedar board-and-batten siding, hand-split cedar shake roof, and exposed rafter ends. The gatehouse was divided into two sections, with its northern third open beneath the roof line, and the southern two-thirds fully enclosed. The gatehouse contained a manual hoist for a slide gate within the intake and a hatch through which the intake and power tunnel could be accessed. (City Light 1969c).

The pre-1967 log footbridge with wood plank decking and open wood rails was retained as part of the reconstructed headworks, crossing above Newhalem Creek downstream of the dam and connecting to a raised concrete slab on the creek's eastern bank to the north of the gatehouse. This slab curved from the east side of the footbridge toward the gatehouse and was lined along its west side with an open wood rail. At the gatehouse, a set of concrete stairs with open metal handrails led down to a second concrete slab constructed above the east side of the sluice channel and over the intake. The lower slab was lined along its west side with a rail consisting of metal posts and chain and along its east side with a rock retaining wall on either side of the concrete stair (City Light 1971b).

A flood destroyed the 1969 gatehouse in 1980. A temporary structure was built in 1981, replaced by the current gatehouse in 1986 (City Light 1981a, 1981b, 1986). In 1984, structural repairs were made the dam, and apron, including the installation of reinforced concrete steel atop the apron to manage bedload abrasion (deterioration of the dam's concrete materials from flowing sediment in the creek), with each receiving a layer of grouting that included galvanized pipe welded to the original imbedded concrete support pipes on the apron (City Light 1984). Historic American Engineering Record (HAER) documentation was completed for the headworks in 1987 and included photographic documentation of the headworks from upstream and of the sluice channel from the footbridge. At that time, the rock retaining wall on the lower slab above the sluice channel had been removed and two of the three metal nappe splitters on the dam had been lost or removed since the 1984 project (City Light 1984; NPS 1987). No alterations had been made to the sluice channel at that time (NPS 1987).

Several alterations to the headworks occurred between 1990 and 2010, including the installation of steel plates on the apron in 1998, which replaced a scoured concrete patch that been installed in 1993, the replacement of the wood rail along the upper slab with a metal rail, and the removal of the pole and chain fencing around the lower concrete slab above the sluice channel and the eastern metal handrail of the pair located along the concrete stair from the gatehouse to the lower slab (Erigero 1990:7-10; City Light 1998; Johnson 2010: File #4242)

The current headworks consists of a diversion dam and apron, sluice channel, intake, gatehouse, footbridge, and associated concrete slabs around gatehouse. The headworks' components appear to be the same as previously documented in 2010, with the exception of the footbridge, and minor changes to the sluice way/channel and related features. The log footbridge was replaced in 2011 with a new steel single-span truss bridge that also included the construction of a new concrete abutment and access gate on the western bank of Newhalem Creek (City Light 2011). Additionally, the northern of the two timber bulkheads on the south side of the sluice channel upstream of the dam has been removed and the metal lining of its slotting severely damaged, a corrugated metal panel has been slotted in the opening of the hoist gate structure at the west end of the sluice channel—though the hoist gate remains present—and the western handrail along the concrete stairs from the gatehouse to the lower slab has been removed.

National Register of Historic Places Eligibility Evaluation

Significance Analysis

National Register of Historic Places Criterion A

The headworks is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its association with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as station service power backup for the Gorge Powerhouse (Johnson 2010:46). Due to a fire in 1966, it was necessary to rebuild the powerhouse to continue operation of the NCHP (Johnson 2010:8-5). The headworks was redeveloped as well from 1967–1969, with the current dam replacing the 1921 wood crib dam and intake structure at the site. The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5).

Given its significant historic associations with the initial hydroelectric development, design, and continued operations of the NCHP and the SRHP, the headworks is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66). However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and SRNCHP (DT 66).

National Register of Historic Places Criterion B

The headworks is not associated with any individuals that played a significant role in national, regional, or local history. At the time of the headworks' construction, City Light was led by John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines within the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. Furthermore, research provided no indication that any other individuals potentially associated with the property played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2020). As such, the headworks is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

National Register of Historic Places Criterion C

The headworks was designed by City Light; however, available documentation does not specify the engineer or contractor responsible for its construction. Though a predominantly intact and integral engineering component of the NHCP and its operation, the design, and materials of the headworks—primarily the concrete diversion dam, sluice channel, and intake components—were common as early as the 1920s as a method of diverting water into conveyance infrastructure for the purposes of offsite hydroelectric generation (Soderberg 1988a:F-5–F-6). Its related components, the gatehouse and footbridge, also represented common architectural and engineering designs and methods of construction for the 1960s.

When considered within the historic context of the NCHP's redevelopment during this period, the rebuilt headworks represents a technologically necessary and substantial improvement on the 1921 NCPDC infrastructure at this site, which ensured the NCHP's continued operation and secured an increased and improved regulated source of water for hydroelectric production. Thus, the headworks is considered significant as a contributor to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the headworks is not considered to be individually significant in engineering under NRHP Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

National Register of Historic Places Criterion D

The headworks is a common example of its engineering type that provides no important

information about the general trends of hydroelectric generation dam and intake construction or design that occurred in Washington during the 1960s and 1970s that cannot be obtained through documentary sources. Therefore, the headworks has not yielded and is not likely to yield information important in prehistory or history. For this reason, the headworks cannot be considered significant under Criterion D. For this reason, the headworks cannot be considered significant a district contributor or individually under Criterion D to the NCPDC or the SRNCHP (DT 66).

Integrity Analysis

Integrity is defined as the ability of a property to convey historic significance through its character-defining physical features, as expressed through integrity of location, setting, design, materials, workmanship, feeling, and association.

The headworks retains integrity in location and setting. The structure has remained in its original location since 1969. Its setting on Newhalem Creek remains remote, mountainous, and heavily forested since its period of construction and no new developments associated with the RLNRA have been introduced in its vicinity.

The headworks retains integrity in design and materials. Alterations to its primary engineered components were limited to necessary maintenance activities to its diversion dam and apron. Though visible, these alterations are obscured by the water flow of Newhalem Creek and not changes to the design of these engineered features. The headworks materials, primarily concrete and to a lesser extent wood and metal, remain mostly intact. Impacts to these materials over time resulted from alterations to the headworks' related features and/or the loss or removal of small-scale components of primary engineered features, including the reconstruction of the gatehouse, replacement of railings along the concrete slabs, and the replacement of the footbridge (log to steel), as well as the removal or loss of the pole and chain railing along the lower concrete slab, the nappe splitters along the diversion dam, and a timber bulkhead and timber weir that formerly occupied openings in the sluice channel. The headworks retains integrity of workmanship. Though the overall workmanship of the headworks has been slightly diminished by the loss of some historic materials and alterations to related features such as the gatehouse and concrete slab railings, the workmanship of the headworks primary engineered features remains largely intact. Features such as the diversion dam and apron and intake structure demonstrate the construction methods used in 1969, including the transportation wood and concrete materials and heavy machinery for site excavation to the headworks site via Dam Access Road, and the use of coffer dams to alter the flow Newhalem Creek during construction.

The headworks retains integrity of feeling and association. The structure remains intact along the banks of Newhalem Creek and within the larger forested and steep terrain environment, and despite individual alterations and lost materials, the headworks as a whole is still recognizable as a late 1960s headworks associated with a hydroelectric facility. as it was constructed at the site of the 1921 NCPDC to supply water to the powerhouse for the generation of power, then redeveloped in 1967–1969 into a more efficient design to continue supplying water to the powerhouse, and its continued function as the primary component to divert water from Newhalem Creek to the powerhouse until 2010.

Overall, the headworks meets the majority of the seven aspects of integrity. It retains integrity in location, setting, design, workmanship, feeling and association. While

alterations to its related features have affected its integrity in materials, the headworks retains sufficient overall integrity to convey its significance under Criteria A and C as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendation

Eligibility as a District Contributor

The headworks is within the boundaries of the SRNCHP (DT 66) historic district, which was listed in the NRHP in 1996 (updated in 2010) under Criteria A, B, and C with a period of significance of 1917–1961. The headworks was previously identified as a component to the Newhalem Creek Powerhouse Site, which was listed in the NRHP as contributing resource to the SRNCHP (DT 66) in the district's Historic Area D, Single Non-Contiguous Resources. (Erigero 1990:7-4; Johnson 2010:7-82).

This study reconsiders the Newhalem Powerhouse Site as a new historic area in the SRNCHP (DT 66) historic district, the Newhalem Creek Powerhouse and Dam Complex, with an expanded period of significance of 1918–1970, beginning with the planning and construction of the NCHP and ending with the year the reconstructed NCHP began producing power. The headworks is recommended eligible for listing in the NRHP as contributor to SRNCHP (DT 66) under Criteria A and C, in the newly recommended historic area.

The headworks is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as a support facility for the Gorge Powerhouse. The reconstruction of the powerhouse and headworks redevelopment following the 1966 fire represented City Light's commitment to the continued operation of the NCHP, with power production resuming in 1970. Until it ceased production in 2010, the NCHP was the oldest operating hydroelectric facility in the Skagit River area. The headworks retains integrity to convey this significance under Criterion A during the 1969–1970 period, the date of the property's completion to the year the redeveloped NCHP began producing power.

The headworks is not recommended as a contributor to the SRNCHP (DT 66) under Criterion B. The district is listed in the NRHP under Criterion B for its significant association with J.D. Ross, Superintendent of City Light from 1911–1939 who was involved substantially in the planning and construction of the SRHP and NCHP. As the headworks was constructed well after 1939, the property does not share this association with J. D. Ross.

The headworks is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion C as one component of the cohesive and intact collection of engineered components that comprise the NCPDC. The necessary and substantial improvements made in 1969 to the original engineering of the NCPDC, including the redevelopment of the headworks, ensured the facilities continued operation and secured an increased and better regulated source of water for hydroelectric production. The headworks retains integrity to convey its engineering significance under Criterion C as part of the redeveloped NCHP in 1969.

Individual NRHP Eligibility

The headworks is significant under Criterion A and retains integrity to convey this significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the headworks alone. Thus, in the absence of individual significance, regardless of physical condition, the headworks cannot be considered to have integrity that conveys individual significance under Criterion A. As such, the headworks is recommended not eligible for individual listing in the NRHP under Criterion A.

The headworks is significant under Criterion C and retains integrity to convey this significance, as discussed previously. However, the significance of its engineering is derived from its context within the redeveloped NCHP's design and function in 1969 that cannot be represented solely by the headworks. Thus, in the absence of individual significance, regardless of physical condition, the headworks cannot be considered to have integrity that conveys individual significance under Criterion C. As such, the headworks is recommended not eligible for individual listing in the NRHP under Criterion C.

Without meaningful connection to an individual important to history, and unable to yield information important to prehistory or history, the headworks cannot be considered to have individual significance under Criteria B or D. Thus, in the absence of individual significance, regardless of physical condition, the headworks cannot be considered to have integrity that conveys individual significance under Criteria B or D. As such, the headworks is recommended not eligible for individual listing in the NRHP under Criteria B or D.

Physical description:

The headworks consists of a diversion dam and apron, sluice way/channel, intake and rock shaft, gatehouse, associated concrete slabs around the gatehouse, and footbridge. Viewing the eastern bank from the western bank of Newhalem Creek, the headworks is tiered onto the eastern bank and covers a larger area than the original 1921 design. The headworks' footbridge crosses from the western bank over the creek to the eastern bank, just downstream (north) of the dam. A short gravel pathway leads from the footbridge to the existing gatehouse, which is situated a few feet above a lower concrete platform adjacent to the east edge of the sluice way/channel. The gatehouse sits atop the intake and rock shaft, which are enclosed beneath the eastern bank concrete slab and gatehouse. From the gatehouse, a narrow concrete stairway provides access to the lower concrete level. An approximately 2-foot concrete retaining wall is north of the concrete steps, and to its south is the concrete foundation for the gatehouse, slightly inset into the sloped eastern bank. The intake's trash rack, consisting of metal grates is visible along the eastern wall of the sluice way/channel. This sluice way/channel is situated between the intake and the dam. Last, the dam and apron extend east-west across the creek with the dam's foundation imbedded into the western bank of the creek.

The concrete diversion dam is 9 feet high, 47 feet wide, and 4.5 feet thick with three metal nappe splitters on the northernmost side of its crest. The dam's downstream (north) concrete apron is flat and conical in shape, with a generally rectangular extension off its northern edge along the eastern bank of Newhalem Creek. The flat conical portion of the concrete apron is surface reinforced by a similarly shaped steel plate covering 2/3 of the apron that was installed in 1998 (City Light 1998).

The sluice way is a predominantly concrete and mostly rectangular shaped channel

measuring approximately 36-feet long and 5-feet wide. Located between the gatehouse and the east side of the diversion dam, it is used to divert water from Newhalem Creek (upstream) into the intake or back into the creek or onto the apron below the diversion dam (downstream). The channel's west wall abuts the dam at its north end, and the wall is wider than the south end. Though timber bulkheads were originally slotted into these openings on the sluice channel's west side upstream of the dam, only the northern bulkhead remains intact. The channel's east wall is slightly sloped and appears to be integrated into the gatehouse's concrete foundation and platform which functions as a trash rack for the intake below the gatehouse and within the concrete slab. The trash rack is steel with vertical thin bars. A hoist gate is located at the north end of the channel that can be used to divert water west onto the dam apron, or a gate can be fitted in place on the west wall to divert water north directly into the creek channel. Currently, a corrugated metal panel has been slotted into the opening on the north end of the channel to divert water onto the apron.

The intake and rock shaft, due to their subterranean nature, could not be documented, and the condition of both components is unknown. Based on available documentation including City Light construction documents and existing historic resources documentation, the intake and rock shaft have not been altered since 1969.

The current gatehouse was built in 1986, replacing a temporary structure built in 1981 after a flood destroyed the 1969 gatehouse in 1980 (City Light 1981a, 1981b, 1986). The gatehouse is situated above the intake on a concrete slab on the east side of the headworks. The gatehouse is a small square off center gable-roofed structure with rough board-and-batten cedar and fir cladding. The gatehouse's roof is clad in standing-seam metal panels and has wide overhangs. Decorative wood trapezoidal rafter tails matching those of the powerhouse, though smaller in scale, extend out beyond the roof's overhang on its south and north sides. The northeastern corner of the gatehouse is devoted to a storage area covered by the roofline and enclosed with three-quarter-height walls and a three-quarter-height gate. The building's southern two-thirds are fully enclosed, with an inset access door inset beneath its roofline at its southwest corner. A pair of wood vent windows are near the base of the gatehouse's east façade near its northeast corner.

Two concrete slabs are tiered along the eastern bank of Newhalem Creek, enclosing the intake and rock shaft and serving as the gatehouse foundation and eastern wall of the sluice channel. The upper slab curves from the eastern side of the footbridge to the gatehouse and is topped with an open metal railing. A stair with metal handrails provides access between the upper and lower slabs. Original features associated with these slabs have been lost or removed, including rock retaining wall north of the concrete stair and the pole and chain fencing around the lower concrete slab, while other features have been replaced, such as the wood fencing around the upper concrete slab with the metal railing.

A steel footbridge crosses Newhalem Creek downstream above the dam apron from the western side of the headworks to the upper concrete slab on the eastern bank north of the gatehouse. The bridge's eastern concrete abutment is exposed on the eastern bank of Newhalem Creek, while the western abutment is embedded in the western bank.

The aboveground components of the headworks are in fair condition.

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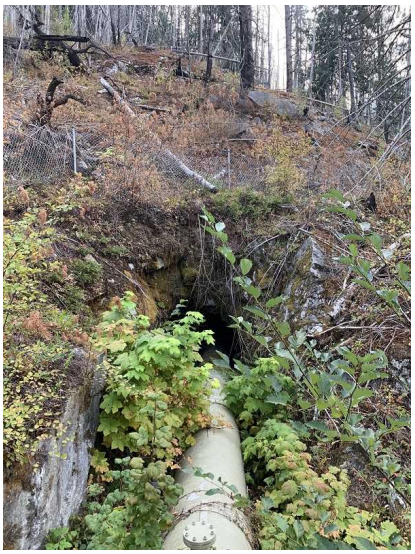
Historic Property Report

Historic Name: Power tunnel

Property ID: 729312

Location



Address: Newhalem, Washington

Geographic Areas: DIABLO DAM Quadrangle, T37R12E28, Whatcom County

Information

Number of stories: N/A

Construction Dates:

Construction Type	Year	Circa
Built Date	1921	☐

Historic Use:

Category	Subcategory
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility

Historic Context:

Category

Architect/Engineer:

Category	Name or Company
Engineer	City of Seattle, Department of City Light

Historic Property Report

Historic Name: Power tunnel

Property ID: 729312

Thematics:

Local Registers and Districts

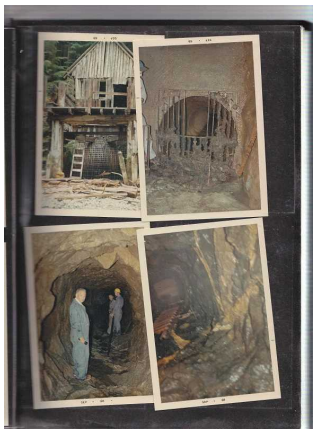
Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2021-08-05085, , Newhalem Creek Hydroelectric Project Decommissioning		Survey/Inventory	

Photos

Power tunnel northern terminus in 2022, facing south-southwest.



Photos of City Light crews in power tunnel and original intake and gatehouse in 1968.

Historic Property Report

Historic Name: Power tunnel Property ID: 729312

Inventory Details - 9/26/2022

Common name:

Date recorded: 9/26/2022

Field Recorder: Corey Lentz; Will Linder; January Tavel

Field Site number:

SHPO Determination

Detail Information

Surveyor Opinion

Property is located in a potential historic district (National and/or local): Yes

Property potentially contributes to a historic district (National and/or local): Yes

Significance narrative: This inventory recommends the Newhalem Creek Powerhouse and Dam Complex (NCPDC) power tunnel (hereafter referred to as the power tunnel), located near the town of Newhalem in Whatcom County, Washington, not eligible for individual listing in the NRHP under Criteria A, B, C, or D. However, the property is recommended eligible as a contributor to the Skagit River and Newhalem Creek Hydroelectric Projects (SRNCHP) (DT 66) under Criterion A, B, and C. Supporting analysis is provided in the historic context, eligibility evaluation (significance analysis, integrity analysis, and eligibility recommendation statement), and physical description herein.

Historic Context

Prior to the development of the City of Seattle, City Light Department's (City Light) Skagit River Hydroelectric Project (SRHP), the upper Skagit River was a remote and rugged area in Whatcom County where Native American groups had lived for millennia. What eventually became the town of Newhalem was part of an extended Upper Skagit village system called k'wabacábš. Oral history and archaeological evidence indicate that the area around the powerhouse was important for hunting, gathering, and fishing (Mierendorf 1996). Euro-American miners began travelling upriver in the 1880s in search of gold, constructing rudimentary cabins at their claim sites. By the 1890s, a few homesteaders had settled along upper Skagit River in the vicinity of the future site of Newhalem to provision miners with supplies, but by the time City Light sought to develop the area as a potential site of hydroelectric power in the 1910s, the upper Skagit River remained remote and sparsely populated by Euro-Americans. (Johnson 2010:8-2–8-4).

As part of the planning process for SRHP, City Light determined it needed a small temporary hydroelectric facility sited near the work camp and construction site. This facility, the Newhalem Creek Hydroelectric Project (NCHP), was constructed on Newhalem Creek, a tributary off the south side of the Skagit River southwest of present day Newhalem. The construction of the NCHP was a perquisite for the construction of first SRHP facility, the Gorge Powerhouse and Dam Complex (GPDC), as the plant would provide power to the construction camp that would serve as headquarters of the SRHP and would later become the town of Newhalem. The site of the NCPDC was surveyed and selected for the proposed temporary facility in the summer of 1918. (Johnson 2010:8-5).

Construction materials were transported from City Camp (present-day Town of

Newhalem) to the powerhouse site using construction methods common to logging during the early 20th century. City Light constructed a cableway skidding system (also referred to as an overhead system) from the railway on the north bank of the river to the powerhouse site, which was used to move materials across the river just to the west of the suspension bridge (City Light 1919f, 1920a; Bryant 1923:504). This overhead system consisted of a set of two poles connected by a cross bar (referred to as a head spar tree) on each bank of the river, with the northern head spar tree additionally supported by a central strut (City Light 1920a; Bryant 1923:504). A cable ran between each head spar tree, with winches on either side to facilitate the movement of the traveler (the device that held materials) along the cable (City Light 1920a). This system remained in place just north of the suspension bridge through at least 1937 but was removed by the early 1950s (City Light 1937). After materials crossed the river, they were transported west to the powerhouse along the skid road. A skidder—a device powered by steam or electricity that operates on or near a railroad track, which moves materials by means of a cable—was installed on the hill to the east and behind the powerhouse to transport construction materials uphill from the powerhouse site to build the penstock (Figure 6) (City Light 1920f; Bryant 1923:504).

The headworks site was accessed by a pedestrian trail, known as the Gatehouse Trail, which ascended the adjacent hillside on southwestern alignment from the powerhouse toward Newhalem Creek, and then proceeded west and south above and to the east of Newhalem creek (City Light 1920e). The alignment of the Gatehouse Trail was depicted in City Light's April 1920 Drawing No. B-55 and again in the NCHP's 1969 FERC license application, though the trail was not explicitly identified in the latter (City Light 1920f). Construction materials for the 1921 headworks' timber crib dam and intake/gatehouse structure were sourced directly from the headworks site and surrounding area (City of Seattle 1969:Exhibit Q-1).

The NCPDC was completed in 1921, with power first produced in August of that year (Johnson 2010:7-44, 8-5). The 1921 NCPDC included a headworks on Newhalem Creek approximately one mile upstream from its confluence with the Skagit River, power tunnel, penstock, powerhouse, tailrace, and transmission line. The 1921 headworks' low log crib diversion dam that directed water into a vertical timber intake structure east of the dam connected to the power tunnel by a 55-foot-tall, 5-foot by 5-foot vertical rock shaft (City Light 1921a, 1921, 2022:1-1; Johnson 2010:8-5). From the intake, water flowed north–northwest underground through the 2,452 feet long bored power tunnel (Johnson 2010:8-5; City Light 2022:1-1). Below ground, the power tunnel funneled water via a pipe intake bell surrounded by a concrete plug into the 925-foot penstock, of which 218 feet were located within the rock tunnel and the remaining 707 feet ran downhill to the powerhouse after daylighting from the rock tunnel (City Light 1919b; 2022:1-1; Johnson 2010:8-5). Along its descending alignment, the penstock was supported by U-shaped timber saddles, placed at regular short intervals between six thrust blocks (City Light 1920c). The penstock split as it entered the powerhouse to service each of the plant's Pelton Water Wheel Company (PWWC) double-nozzle impulse-type waterwheels, which powered a 2,000- kilovolt amperes (kVA) Westinghouse generator (City Light 1920c; Johnson 2010:8-5; Engineering World 1920:314). Water was discharged from the powerhouse into the tailrace, which ran north to the Skagit River (Roberts 1924:952; Johnson 2010:8-5). The original 1921 NCPDC powerhouse was a rustic wood framed building with board-and-batten siding, a corrugated metal roof, and a series of wood-sashed windows along its north façade (City Light 1919a). A 6600-volt aboveground transmission line transmitted power from the powerhouse, which ran northwest over the Skagit River to the rail line in Newhalem, and then northeast to the GPDC

construction site (City Light 1921c).

The NCHP provided power to the buildings of the City Camp (later Newhalem), as well as the construction of both the Gorge power tunnel and powerhouse. These competing demands on the facility's limited capacity led to power shortages and delays in the construction of the GPDC (Johnson 2010:8-6). City Light initially intended the NCHP to be a temporary facility to facilitate the construction of the City Camp and the GPDC (Johnson 2010:8-5). However, the facility remained in operation following the completion of the GPDC in 1924, with its output then routed into the larger Skagit transmission and distribution network. In this new role as a local production and support facility, the NCHP provided power for the town of Newhalem and station service power for the Gorge Powerhouse's electrically operated equipment (e.g., heating, lighting and cooling). The NCHP was semi-automated in the early 1950s, allowing it to operate largely unmanned, with manual start-up and shut-down still required (Johnson 2010:8-5). City Light redeveloped the transmission line from the powerhouse to the Gorge Powerhouse in 1965, undergrounding most of the line within the town of Newhalem and rerouting it along the north bank of the Skagit River (City Light 1965a, 1965b).

A fire in July 1966 severely damaged the powerhouse. It burned down the building, but a flange gasket in one line of the bifurcated penstock behind the powerhouse blew out, creating a 60- to 70-foot-high sheet of water behind the powerhouse preventing fire damage in the surrounding wooded area. Additionally, the equipment within the powerhouse continued to run, saving the original PWWC turbines and Westinghouse generator from warping from the heat of the fire. (Johnson 2010:8-5). After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. In 1968 City Light replaced a log stringer bridge over Newhalem Creek on Powerhouse Road with the current Newhalem Creek Bridge to access the powerhouse from the west (City Light 1968a; City of Seattle 1969:Exhibit N).

The current powerhouse was constructed between 1967 and 1969 (Johnson 2010:7-44). The only major repair on the generating equipment was the rewinding of the Westinghouse generator and minor welding repair to the two PWWC turbines (Johnson 2010:8-5). The existing headworks on Newhalem Creek was also rebuilt during this period. The 1969 headworks consisted of a curved diversion dam and apron, rectangular sluice way/channel, intake and rock shaft, gatehouse, and associated concrete slabs around the gatehouse; the 1969 headworks retained the existing log footbridge that crossed from the western bank access road to the gatehouse on the eastern bank (City Light 1969a, 1969b). The redeveloped NCHP retained and continued to utilize the original power tunnel, penstock, and tailrace, which required only minor maintenance and repairs following the fire. Before going back online in 1970, the NCHP was fully automated, the first of the Skagit River facilities to undergo the process, and remote control of the newly operational powerhouse equipment was established at the Gorge Powerhouse. (Johnson 2010:7-44, 8-5, 8-46; City Light 1971:11).

The NCHP was relicensed in 1997 and continued to operate until 2010 (City Light 1992, 2022:A-5). The NCHP has not been consistently in service since 2010 due to an automatic gate valve requiring repairs. While equipment and structural issues resulting in the 2010 shutdown were eventually addressed, subsequent issues necessitated the current decommissioning of the NCHP. In 2015, a wildfire burned many of the original wooden penstock saddles, requiring an extensive replacement project in 2016-2017. More recently, leaks in the power tunnel, maintenance needs at the headworks and

powerhouse, and access road safety concerns prohibit the continued operation of the NCHP. In 2021, City Light began the process of surrendering the facility's license (City Light 2022:vi).

Skagit River and Newhalem Creek Hydroelectric Projects NRHP Listing

The SRNCHP (DT 66) was listed in the NRHP in 1996, with the nomination updated in 2010 (Erigero 1990; Johnson 2010). As of 2010, the SRNCHP (DT 66) is listed in the NRHP as significant at the national level under Criteria A, B, and C and has a period of significance of 1917–1961, beginning in the year the SRHP was first conceptualized by City Light and ending with the completion of the Gorge High Dam. The district is listed under Criterion A, in the area of Politics and Government, because it represents almost 50 years of American utility politics and development from the Progressive Era through the decades following World War II. The projects' development ensured the existence of City Light as a municipal utility and was immensely influential on the public power movement over the course of the 20th century. The district is listed under Criterion B, in the areas of Politics and Government, Entertainment/Recreation, and Landscape Architecture, for its association with J.D. Ross, City Light Superintendent for 28 years, and Ross's vision for City Light and public power, in particular hydroelectric power. Ross was instrumental in the projects' development, but also used the projects as a showcase to promote hydroelectric power and municipal utility ownership. The district is also listed under Criterion C, in the areas of Community Planning and Development, Engineering, Architecture, and Transportation for its representation of a general trend of developing more costly and remote hydroelectric sites in the 1920s and for its new and inventive engineering practices, both in the technical construction of the facilities themselves, as well as in the development of municipally owned towns (Newhalem and Diablo, Washington) and the transportation infrastructure required for their construction (Johnson 2010:8-1–8-2).

The historic district is three miles long and extends in a discontiguous linear manner along the north and south banks of, over and across the Skagit River within the Ross Lake National Recreation Area (RLNRA). Starting in Newhalem and extending east to Ross Dam, it includes the sequence of towns and industrial resources related to the SRNCHP (DT 66) and is grouped into seven discrete historic areas: Historic Area A – Town of Newhalem; Historic Area B – Gorge Powerhouse and Dam Complex; Historic Area C – Diablo Powerhouse Complex; Historic Area D Discontiguous Resources – Diablo Lake; Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site; Historic Area E – Ross Powerhouse and Dam Complex; and Historic Area F – Hollywood Residential Area. The lakes formed by the dams are not included in the district. (Johnson 2010:7-2).

Property Development

The power tunnel is located on the south side of the Skagit River near Newhalem in Whatcom County, Washington. It is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA, a subunit of the National Parks Service (NPS) North Cascades National Park Service Complex. The power tunnel was constructed in 1921 based on a design by City Light but available documentation does not specify a specific engineer or contractor (Johnson 2010:7-44–7-45).

At the time of its construction, the power tunnel consisted of a 2452-foot tunnel, measuring approximately 6 feet by 7 feet with an 8.6 percent grade. The tunnel was

bored through the bedrock of the adjacent hill using air-driven jackhammers and Leyner drills. Drilling teams worked in three shifts, with 119 feet the best weekly advance recorded. Construction of the tunnel required the excavation of a 55-foot rock shaft at the headworks site, now connected to the Headwork's intake and covered by its gatehouse, from which the power tunnel could be horizontally bored. The alignment of the tunnel ran straight north-northwest. A steel intake bell surrounded by a concrete plug was constructed 218-feet from the tunnel's northern terminus that forced water into the penstock. (City Light 2022a:1-1; City Light 1919b Johnson 2010:8-5).

Following the 1966 fire, crews examined the tunnel during the redevelopment of the headworks (City Light 1968b). Photos of the tunnel taken at this time show the rough unlined rock of the tunnel's interior (City Light 1968b). The only documented alteration to the power tunnel is the installation in 1987 of a 6-inch flange drain pipe supported by wood posts that ran above the penstock within the tunnel from the concrete plug to outside the tunnel's northern terminus (City Light 1987).

The design and construction of the power tunnel is described in 1990 and 2010 NRHP documentation for the SRNCHP (DT 66). However, due to the subterranean nature of the property, the power tunnel was not photographed, and engineering plans were not developed during these documentation efforts, which relied primarily on construction plans provided by City Light and other secondary sources to substantiate descriptions of the power tunnel (Erigero 1990; Johnson 2010). Current documentation efforts faced similar difficulties of access. While the northern terminus of the power tunnel is accessible, field investigation of this area produced no new information about the power tunnel.

National Register of Historic Places Eligibility Evaluation

Significance Analysis

National Register of Historic Places Criterion A

The power tunnel is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its association with the 1918–1921 development of the NCHP for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem. It is also significant with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and station service power backup for the Gorge Powerhouse (Johnson 2010:8-46). The power tunnel is one of three extant components of the NCPDC from 1921, the others being the penstock and tailrace. Due to the fire in 1966, it was necessary to reconstruct the powerhouse to continue the operation of the NCHP; the headworks was also redeveloped during this period (Johnson 2010:8-5). The power tunnel was retained and continued to function as a water conveyance component of the redeveloped NCHP (Johnson 2010:8-5). The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5).

Given its significant historic associations with the initial hydroelectric development, design, and continued operations of the NCHP and the SRHP, the power tunnel is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66). However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other

components of the NCPDC and SRNCHP (DT 66).

National Register of Historic Places Criterion B

The power tunnel is significant under Criterion B for its associations with J.D. Ross, a person of regional and national significance for his 28-year tenure as Superintendent of City Light over the agency's first three decades, during which he was involved substantially in the planning and construction of the NCHP and SRHP. He was also associated with promoting hydroelectric power in the region and nationally (Johnson 2010:8-50–8-51, 8-62–8-63). However, the power tunnel's association with Ross is linked directly with the development of the NCHP in its entirety and cannot be represented by the power tunnel alone. As such, the power tunnel is not considered individually significant under NRHP Criterion B. When considered within the context of the NCHP's development and its significant association with Ross from 1918–1939, the power tunnel is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66) under Criterion B.

At the time of the NCHP's redevelopment, City Light was led by Superintendent John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines within the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. As such, the headworks is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

National Register of Historic Places Criterion C

The power tunnel was designed by City Light; however, available documentation does not specify the engineer or contractor responsible for its construction. The power tunnel's design, a straight and narrow alignment along a moderate grade, and method of construction, horizontal boring using compressed air and Leyner Drills, were quite common for tunnel construction by 1921 (MacRae 2012). Furthermore, the use of power tunnels in lieu of aboveground water conveyance structures was becoming more common for hydroelectric developments by this time (Soderberg 1988a:F-5). The power tunnel's design is simple and required no innovative construction methods, as it is bored directly though the bedrock of the adjacent mountain without the application of any additional lining. Comparatively, the GPDC power tunnel is significant for its engineering and construction, including the innovative horseshoe-shape design of the tunnel and its associated surge tank, and for the specific type of nozzle developed by City Light to facilitate the construction of its concrete lining (Johnson 2010:8-54).

When considered within the context of the NCPDC's design, the power tunnel's engineering and design is considered significant. The 1921 NCPDC design is a significant example of an early 20th century hydroelectric facility constructed for the purpose of supplying power to a construction work camp associated with larger hydroelectric projects in its vicinity. Due to the mountainous nature of its setting and the distance between the site of the headworks on Newhalem Creek and the powerhouse near the

Skagit River, the power tunnel was a necessary and integral engineered component of the NCPDC's water conveyance system for power production. It continued to function as such in the redeveloped NCHP. The power tunnel retains integrity to convey the significance of this system. The power tunnel is, thus, found to be a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the power tunnel is not considered to be individually significant in engineering under NRHP Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

National Register of Historic Places Criterion D

The power tunnel is a common example of its engineering type that provides no important information about the general trends of hydroelectric generation facility construction or design, or hydroelectric power generation that occurred in Washington during the 1910s and 1920s that cannot be obtained through documentary sources. Therefore, the power tunnel has not yielded and is not likely to yield information important in prehistory or history. For this reason, the power tunnel cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Integrity Analysis

Integrity is defined as the ability of a property to convey historic significance through its character-defining physical features, as expressed through integrity of location, setting, design, materials, workmanship, feeling, and association.

The power tunnel retains integrity in location. The structure remains in its original location and its alignment has not changed since it was built in 1921. Due to its subterranean nature, the aspect of setting is less significant for this property. However, the setting of the tunnel's northern terminus, the single aboveground feature of the property, remains a remote and heavily forested hillside. The power tunnel retains integrity in design, materials, and workmanship. The alignment of the tunnel has not been altered and lined with any other materials. The retention of its bare rock walls demonstrates both this lack of materials as well as intensive construction methods used by boring crews in the early 1920s. The drain pipe introduced into the rock tunnel along the penstock in 1987 is a minimal alteration and does not detract from power tunnels integrity in these aspects. The property retains integrity of feeling and association. Due to its subterranean nature, the property is only minimally visible at its northern terminus, but remains tied to its forested, mountainous environment on the banks of Newhalem Creek where it was built in 1921 as part of the NCPDC to supply water from the headworks to the powerhouse for the generation of power, and then reused in the 1969 redevelopment of the NCHP to continue supplying water to the powerhouse until 2010.

Overall, the power tunnel retains integrity in all seven aspects. Thus, it retains overall integrity to convey its significance under Criteria A, B, and C as a contributor to the SRNCHP (DT 66).

Eligibility Recommendation

Eligibility as a District Contributor

The power tunnel is in the boundaries of the SRNCHP (DT 66) historic district, which was

listed in the NRHP in 1996 (and updated in 2010) under Criteria A, B, and C with a period of significance of 1917–1961. The power tunnel was previously identified as a component to the Newhalem Creek Powerhouse Site, which was listed in the NRHP as a contributing resource to the SRNCHP (DT 66) in the district's Historic Area D, Single Non-Contiguous Resources (Erigero 1990:7-4; Johnson 2010:7-82).

This study reconsiders the Newhalem Powerhouse Site as a new historic area within the SRNCHP (DT 66) district, the Newhalem Creek Powerhouse Complex, with an expanded period of significance of 1918–1970, beginning with the planning and construction of the NCHP and ending with the year the reconstructed NCHP began producing power. The power tunnel is recommended eligible for listing in the NRHP as a contributor to the SRNCHP (DT 66) under Criteria A, B, and C, in the newly recommended historic area.

The power tunnel is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the development of the NCHP from 1918–1921 for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem, and with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as a support facility for the Gorge Powerhouse. The reconstruction of the powerhouse and headworks redevelopment following the 1966 fire represents City Light's commitment to the facility's continued operation, with power production resuming in 1970. Until it ceased production in 2010, the NCHP was the oldest operating hydroelectric facility in the Skagit River area. The power tunnel retains integrity to convey this significance under Criterion A during the entire 1918–1970 period, representing both the NCHP's original development from 1918–1921, as well as its redevelopment in 1967–1970 and continued operation thereafter.

The power tunnel is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion B, for its significant association with J.D. Ross, the Superintendent of City Light during the period of the NCPDC's original construction. He was involved substantially in the planning and construction of the SRHP and NCHP. The power tunnel's significance under Criterion B is limited to the 1918–1939 period, beginning with the start of planning and construction of the NCHP and ending at the end of Ross's tenure as Superintendent of City Light. As an intact original component of the NCPDC, the power tunnel retains integrity to convey its significant association with Ross.

The power tunnel is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion C as one component of the cohesive collection of engineered components that comprise the NCPDC. As an original component, the power tunnel represents the NCPDC's 1921 design and construction and the necessary and substantial improvements made in 1969 to the original engineering of the NCPDC, including the reconstruction of the powerhouse, which ensured its continued operation and secured an increased and improved regulated source of water for hydroelectric production. As a functional and integral component of the NCPDC, City Light determined that the 1921 power tunnel still had relevancy in 1969 and integrated it into the redeveloped system. The power tunnel retains integrity to convey its engineering significance under Criterion C as a component of both the NCPDC's original 1921 and redeveloped 1969 designs.

Individual NRHP Eligibility

The power tunnel is significant under Criterion A and retains integrity to convey its

significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the power tunnel alone. Thus, in the absence of individual significance, regardless of physical condition, the power tunnel cannot be considered to have integrity that conveys individual significance under Criterion A. As such, the power tunnel is recommended not eligible for individual listing in the NRHP under Criterion A.

The power tunnel is significant under Criterion B and retains integrity to convey this significance, as discussed previously. However, the power tunnel's association with Ross is linked directly with the development of the NCHP in its entirety and cannot be represented solely by the power tunnel. Thus, in the absence of individual significance, regardless of physical condition, the power tunnel cannot be considered to have integrity that conveys individual significance under Criterion B and is recommended not eligible for individual listing in the NRHP under Criterion B.

The power tunnel is significant under Criterion C and retains integrity to convey this significance, as discussed previously. However, the significance of its engineering is derived from its context within the initial NCPDC's design and function in 1921 and redeveloped NCPDC's design and function in 1969 that cannot be represented solely by the power tunnel. Thus, in the absence of individual significance, regardless of physical condition, the power tunnel cannot be considered to have integrity that conveys individual significance under Criterion C and is recommended not eligible for individual listing in the NRHP under Criterion C.

The power tunnel lacks the ability to yield information important to prehistory or history and, thus, cannot be considered to have individual significance under Criteria D. Thus, in the absence of individual significance, regardless of physical condition, the power tunnel cannot be considered to have integrity that conveys individual significance under Criterion D and is recommended not eligible for individual listing in the NRHP under Criterion D.

Physical description:

The power tunnel consists of a 2,452-foot unlined rock tunnel, measuring approximately 6 feet by 7 feet with an 8.6 percent grade. A steel intake bell surrounded by a concrete plug is constructed 218-feet from the tunnel's northern terminus that forced water into the penstock. The tunnel has a straight north-northwest alignment and is bored through the surrounding bedrock, from the rock shaft of the Headwork's intake to its northern terminus. The power tunnel is not lined with any materials. However, a 6-inch flange drainpipe supported by wood posts that runs above the penstock within the tunnel from the concrete plug to outside the tunnel's northern terminus was installed in 1987. Due to its subterranean nature, the current condition of the power tunnel could not be documented. The northern terminus is visible, though vegetation is encroaching the tunnel entrance in the open rock face.

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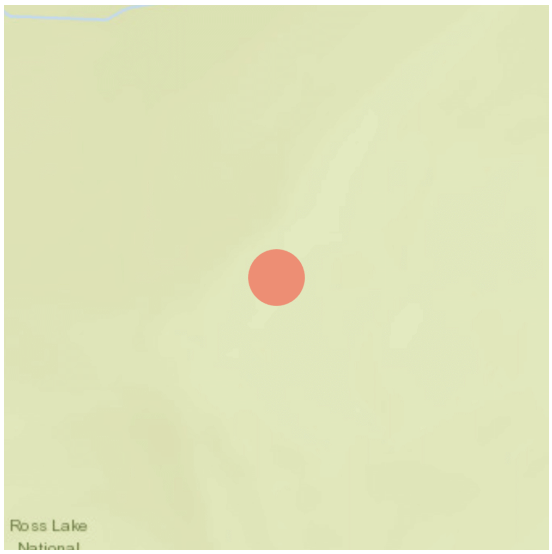
Historic Property Report

Historic Name: Penstock

Property ID: 729313

Location



Address: Newhalem, Washington

Geographic Areas: T37R12E28, Whatcom County, DIABLO DAM Quadrangle

Information

Number of stories: N/A

Construction Dates:

Construction Type	Year	Circa
Built Date	1921	☐

Historic Use:

Category	Subcategory
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility

Historic Context:

Category

Architect/Engineer:

Category	Name or Company
Builder	Coast Culvert & Flume Company
Engineer	City of Seattle, Department of City Light

Historic Property Report

Historic Name: Penstock

Property ID: 729313

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2021-08-05085, , Newhalem Creek Hydroelectric Project Decommissioning		Survey/Inventory	

Photos

Penstock in 2022, at powerhouse facing southeast.

Powerhouse and penstock under construction in 1921, penstock in background, facing south.

Penstock in 1966 after fire, facing south.

Penstock in 1990, at powerhouse facing southwest.

Penstock in 2022, facing north-northwest from wood platform down to powerhouse.

Penstock in 2022, facing north-northwest from power tunnel down to powerhouse.

Penstock entering power tunnel in 2022, facing southeast.

Penstock entering powerhouse in 2022, facing east.

Penstock thrust block at power tunnel, facing west.

Penstock concrete saddle in 2022, facing southwest.

Penstock platform in 2022, facing south-southwest.

Historic Property Report

Historic Name: Penstock Property ID: 729313

Inventory Details - 9/26/2022

Common name:

Date recorded: 9/26/2022

Field Recorder: Corey Lentz; Will Linder; January Tavel

Field Site number:

SHPO Determination

Detail Information

Surveyor Opinion

Property is located in a potential historic district (National and/or local): Yes

Property potentially contributes to a historic district (National and/or local): Yes

Significance narrative: This inventory recommends the Newhalem Creek Powerhouse and Dam Complex (NCPDC) penstock (hereafter referred to as the penstock), located near the town of Newhalem in Whatcom County, Washington, not eligible for individual listing in the NRHP under Criteria A, B, C, or D. However, the property is recommended eligible as a contributor to the Skagit River and Newhalem Creek Hydroelectric Projects (SRNCHP) (DT 66) under Criteria A, B, and C. Supporting analysis is provided in the historic context, eligibility evaluation (significance analysis, integrity analysis, and eligibility recommendation statement), and physical description herein.

Historic Context

Prior to the development of the City of Seattle, City Light Department's (City Light) Skagit River Hydroelectric Project (SRHP), the upper Skagit River was a remote and rugged area in Whatcom County where Native American groups had lived for millennia. What eventually became the town of Newhalem was part of an extended Upper Skagit village system called k'wabacábš. Oral history and archaeological evidence indicate that the area around the powerhouse was important for hunting, gathering, and fishing (Mierendorf 1996). Euro-American miners began travelling upriver in the 1880s in search of gold, constructing rudimentary cabins at their claim sites. By the 1890s, a few homesteaders had settled along upper Skagit River in the vicinity of the future site of Newhalem to provision miners with supplies, but by the time City Light sought to develop the area as a potential site of hydroelectric power in the 1910s, the upper Skagit River remained remote and sparsely populated by Euro-Americans. (Johnson 2010:8-2–8-4).

As part of the planning process for SRHP, City Light determined it needed a small temporary hydroelectric facility sited near the work camp and construction site. This facility, the Newhalem Creek Hydroelectric Project (NCHP), was constructed on Newhalem Creek, a tributary off the south side of the Skagit River southwest of present day Newhalem. The construction of the NCHP was a perquisite for the construction of first SRHP facility, the Gorge Powerhouse and Dam Complex (GPDC), as the plant would provide power to the construction camp that would serve as headquarters of the SRHP and would later become the town of Newhalem. The site of the NCPDC was surveyed and selected for the proposed temporary facility in the summer of 1918. (Johnson 2010:8-5).

Construction materials were transported from City Camp (present-day Town of

Newhalem) to the powerhouse site using construction methods common to logging during the early 20th century. City Light constructed a cableway skidding system (also referred to as an overhead system) feeder from the railway on the north bank of the river to the powerhouse site, with which was a cableway skidding system (also referred to as an overhead system) used to move materials across the river just to the west of the suspension bridge (City Light 1919f, 1920a; Bryant 1923:504). This overhead system consisted of a set of two poles connected by a cross bar (referred to as a head spar tree) on each bank of the river, with the northern head spar tree additionally supported by a central strut (City Light 1920a; Bryant 1923:504). A cable ran between each head spar tree, with winches on either side to facilitate the movement of the traveler (the device that held materials) along the cable (City Light 1920a). This system remained in place just north of the suspension bridge through at least 1937 but was removed by the early 1950s (Figure 5) (City Light 1937 n.d.a.). After materials crossed the river, they were transported west to the powerhouse along the skid road. A skidder—a device powered by steam or electricity that operates on or near a railroad track, which moves materials by means of a cable—was installed on the hill to the east and behind the powerhouse to transport construction materials uphill from the powerhouse site to build the penstock (City Light 1920f; Bryant 1923:504).

The headworks site was accessed by a pedestrian trail, known as the Gatehouse Trail, which ascended the adjacent hillside on southwestern alignment from the powerhouse toward Newhalem Creek, and then proceeded west and south above and to the east of Newhalem creek (City Light 1920e). The alignment of the Gatehouse Trail was depicted in City Light's April of 1920 Drawing No. B-55 and again in the NCHP's 1969 FERC license application, though the trail was not explicitly identified in the latter (City Light 1920g). Construction materials for the 1921 headworks' timber crib dam and intake/gatehouse structure were sourced directly from the headworks site and surrounding area (City of Seattle 1969:Exhibit Q-1).

The NCPDC was completed in 1921, with power first produced in August of that year (Johnson 2010:7-44, 8-5). The 1921 NCPDC included a headworks on Newhalem Creek approximately one mile upstream from its confluence with the Skagit River, power tunnel, penstock, powerhouse, tailrace, and transmission line. The 1921 headworks' low log crib diversion dam that directed water into a vertical timber intake structure east of the dam connected to the power tunnel by a 55-foot-tall, 5-foot by 5-foot vertical rock shaft (City Light 1921a, 1921b, 2022c:1-1; Johnson 2010:8-5). From the intake, water flowed north–northwest underground through the 2,452 feet long bored power tunnel (Johnson 2010:8-5; City Light 2022:1-1). Below ground, the power tunnel funneled water via a pipe intake bell surrounded by a concrete plug into the 925-foot penstock, of which 218 feet were located within the rock tunnel and the remaining 707 feet ran downhill to the powerhouse after daylighting from the rock tunnel (City Light 1919b; 2022:1-1; Johnson 2010:8-5). Along its descending alignment, the penstock was supported by U-shaped timber saddles, placed at regular short intervals between six thrust blocks (City Light 1920c). The penstock split as it entered the powerhouse to service each of the plant's Pelton Water Wheel Company (PWWC) double-nozzle impulse-type waterwheels, which powered a 2,000- kilovolt amperes (kVA) Westinghouse generator (City Light 1920c; Johnson 2010:8-5; Engineering World 1920:314). Water was discharged from the powerhouse into the tailrace, which ran north to the Skagit River (Roberts 1924:952; Johnson 2010:8-5). The original 1921 NCPDC powerhouse was a rustic wood framed building with board-and-batten siding, a corrugated metal roof, and a series of wood-sashed windows along its north façade (City Light 1919a). A 6600-volt aboveground transmission line transmitted power from the powerhouse, which ran northwest over

the Skagit River to the rail line in Newhalem, and then northeast to the GPDC construction site (City Light 1921c).

The NCHP provided power to the buildings of the City Camp (later Newhalem), as well as the construction of both the Gorge power tunnel and powerhouse. These competing demands on the facility's limited capacity led to power shortages and delays in the construction of the GPDC (Johnson 2010:8-6). City Light initially intended the NCHP to be a temporary facility to facilitate the construction of the City Camp and the GPDC (Johnson 2010:8-5). However, the facility remained in operation following the completion of the GPDC in 1924, with its output then routed into the larger Skagit transmission and distribution network. In this new role as a local production and support facility, the NCHP provided power for the town of Newhalem and station service power for the Gorge Powerhouse's electrically operated equipment (e.g., heating, lighting and cooling). The NCHP was semi-automated in the early 1950s, allowing it to operate largely unmanned, with manual start-up and shut-down still required (Johnson 2010:8-5). City Light redeveloped the transmission line from the powerhouse to the Gorge Powerhouse in 1965, undergrounding most of the line within the town of Newhalem and rerouting it along the north bank of the Skagit River (City Light 1965a, 1965b).

A fire in July 1966 severely damaged the powerhouse. It burned down the building, but a flange gasket in one line of the bifurcated penstock behind the powerhouse blew out, creating a 60- to 70-foot-high sheet of water behind the powerhouse preventing fire damage in the surrounding wooded area. Additionally, the equipment within the powerhouse continued to run, saving the original PWWC turbines and Westinghouse generator from warping from the heat of the fire. (Johnson 2010:8-5). After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. In 1968 City Light replaced a log stringer bridge over Newhalem Creek on Powerhouse Road with the current Newhalem Creek Bridge to access the powerhouse from the west (City Light 1968; City of Seattle 1969:Exhibit N).

The current powerhouse was constructed between 1967 and 1969 (Johnson 2010:7-44). The only major repair on the generating equipment was the rewinding of the Westinghouse generator and minor welding repair to the two PWWC turbines (Johnson 2010:8-5). The existing headworks on Newhalem Creek was also rebuilt during this period. The 1969 headworks consisted of a curved diversion dam and apron, rectangular sluice way/channel, intake and rock shaft, gatehouse, and associated concrete slabs around the gatehouse; the 1969 headworks retained the existing log footbridge that crossed from the western bank access road to the gatehouse on the eastern bank (City Light 1969a, 1969b). The redeveloped NCHP retained and continued to utilize the original power tunnel, penstock, and tailrace, which required only minor maintenance and repairs following the fire. Before going back online in 1970, the NCHP was fully automated, the first of the Skagit River facilities to undergo the process, and remote control of the newly operational powerhouse equipment was established at the Gorge Powerhouse. (Johnson 2010:7-44, 8-5, 8-46; City Light 1971:11).

The NCHP was relicensed in 1997 and continued to operate until 2010 (City Light 1992, 2022c:A-5). The NCHP has not been consistently in service since 2010 due to an automatic gate valve requiring repairs. While equipment and structural issues resulting in the 2010 shutdown were eventually addressed, subsequent issues necessitated the current decommissioning of the NCHP. In 2015, a wildfire burned many of the original wooden penstock saddles, requiring an extensive replacement project in 2016-2017.

More recently, leaks in the power tunnel, maintenance needs at the headworks and powerhouse, and access road safety concerns prohibit the continued operation of the NCHP. In 2021, City Light began the process of surrendering the facility's license (City Light 2022c:vi).

Skagit River and Newhalem Creek Hydroelectric Projects NRHP Listing

The SRNCHP (DT 66) was listed in the NRHP in 1996, with the nomination updated in 2010 (Erigero 1990; Johnson 2010). As of 2010, the SRNCHP (DT 66) is listed in the NRHP as significant at the national level under Criteria A, B, and C and has a period of significance of 1917–1961, beginning in the year the SRHP was first conceptualized by City Light and ending with the completion of the Gorge High Dam. The district is listed under Criterion A, in the area of Politics and Government, because it represents almost 50 years of American utility politics and development from the Progressive Era through the decades following World War II. The projects' development ensured the existence of City Light as a municipal utility and was immensely influential on the public power movement over the course of the 20th century. The district is listed under Criterion B, in the areas of Politics and Government, Entertainment/Recreation, and Landscape Architecture, for its association with J.D. Ross, City Light Superintendent for 28 years, and Ross's vision for City Light and public power, in particular hydroelectric power. Ross was instrumental in the projects' development, but also used the projects as a showcase to promote hydroelectric power and municipal utility ownership. The district is also listed under Criterion C, in the areas of Community Planning and Development, Engineering, Architecture, and Transportation for its representation of a general trend of developing more costly and remote hydroelectric sites in the 1920s and for its new and inventive engineering practices, both in the technical construction of the facilities themselves, as well as in the development of municipally owned towns (Newhalem and Diablo, Washington) and the transportation infrastructure required for their construction (Johnson 2010:8-1–8-2).

The historic district is three miles long and extends in a discontiguous linear manner along the north and south banks of, over and across the Skagit River within the Ross Lake National Recreation Area (RLNRA). Starting in Newhalem and extending east to Ross Dam, it includes the sequence of towns and industrial resources related to the SRNCHP (DT 66) and is grouped into seven discrete historic areas: Historic Area A – Town of Newhalem; Historic Area B – Gorge Powerhouse and Dam Complex; Historic Area C – Diablo Powerhouse Complex; Historic Area D Discontiguous Resources – Diablo Lake; Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site; Historic Area E – Ross Powerhouse and Dam Complex; and Historic Area F – Hollywood Residential Area. The lakes formed by the dams are not included in the district. (Johnson 2010:7-2).

Property Development

The penstock is located on the south side of the Skagit River near Newhalem in Whatcom County, Washington. It is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA, a subunit of the National Park Service (NPS) North Cascades National Park Service Complex. The penstock was constructed in 1921; it was designed by City Light and built by the Coast Culvert & Flume Company (CCFC) (Johnson 2010:7-44, Allen 1921: 401).

At the time of its construction, the penstock consisted of an approximately 905-foot

single steel pipe that began 218 feet within the power tunnel and ran north–northwest to emerge from a hillside above the powerhouse. Within the power tunnel, the southern end of the penstock was surrounded by a concrete plug, which sealed the tunnel and forced water into the penstock, and its opening was capped with a metal grate to capture debris. From the power tunnel, the penstock ran 707-feet downhill to a flat natural terrace before descending the final short distance to the powerhouse. To address issues of water pressure within the penstock, its diameter gradually decreased over its alignment from 33 inches to 30 inches, while its thickness increased from 5/16-inch flange steel at the top to 3/8-inch flange steel at the base of the hill. Forty-four flexible Dresser couplings, which also function as expansion joints, connect the penstock's approximately 20-foot-long segments at regular intervals. A rectangular concrete thrust block, also referred to as an anchor block, was constructed around the penstock just beyond where it emerged from the northern end of the power tunnel. These thrust blocks, each uniquely designed to counter the force of water rushing down the pipe, prevent the penstock from moving and are typically located at points where the angle of the penstock's alignment changes. Four similar thrust blocks were constructed around the pipe at regular intervals along its descending alignment from the power tunnel to the powerhouse. As it reached the powerhouse, the penstock split into two separate pipes, each entering the powerhouse at the base of the building's south side to convey water to each of the powerhouse's two waterwheels. This separation point was encased in a trapezoidal concrete thrust block similar to those built along its alignment on the hillside above. The penstock was supported along its alignment by 76 U-shaped timber saddles, placed at regular short intervals between the thrust blocks and Dresser couplings. Notably, the CCFC used electric arc welding to construct the penstock, a technique that reduced the cost of extensive field riveting in such a remote location and which was claimed by a company engineer to be the "first installation of welded pipe for such purposes in the Northwest." (City Light 1920c, 1920d, 1921b, 2022a:1-1; Allen 1921:401).

In 1970, an additional rectangular concrete enclosure was constructed around the penstock abutting the 1921 trapezoidal thrust block and topped with a metal access hatch, which contained conduit associated with the powerhouse fire suppression system (City Light 1970). Various repair and maintenance activities were conducted along the penstock's alignment in 1987, including the maintenance of the grade beneath the penstock's saddles to prevent sinking, painting of the piping and timber saddles, the replacement of several saddles with concrete replacements, and the in-kind replacement of saddles and repairs to Dresser couplings within the power tunnel (City Light 1987a, 1987b; City Light 1992). The penstock's remaining timber saddles were all replaced with concrete saddles in 2016 (City Light 2016).

The only previously undocumented alteration to the penstock observed in the current documentation is the construction of a wood platform at an unknown date over the penstock on the flat natural terrace above the powerhouse. This platform is accessed by Tunnel Portal Trail, located to the east of the property running uphill from the east side of the powerhouse to the power tunnel's northern terminus.

National Register of Historic Places Eligibility Evaluation

Significance Analysis

National Register of Historic Places Criterion A

The penstock is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its

association with the 1918–1921 development of the NCHP for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem. It is also significant with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for Newhalem and station service power backup for the Gorge Powerhouse (Johnson 2010:8 -46). The penstock is one of three extant components of the NCPDC from 1921, the others being the power tunnel and tailrace. Due to a fire in 1966, it was necessary to reconstruct the powerhouse to continue the operation of the NCHP; the headworks was also redeveloped during this period. (Johnson 2010:8-5). The penstock was retained and continued to function as a water conveyance component for the NCPDC. The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5).

Given its significant historic associations with the initial hydroelectric development, design and continued operations of the NCHP and the SRHP, the penstock is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66). However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC historic area and the SRNCHP (DT 66).

National Register of Historic Places Criterion B

The penstock is significant under Criterion B for its associations with J.D. Ross, a person of regional and national significance for his 28-year tenure as Superintendent of City Light over the agency's first three decades, during which he was involved substantially in the planning and construction of the NCHP and SRHP. He was also associated with promoting hydroelectric power in the region and nationally (Johnson 2010:8-50–8-51, 8-62–8-63). However, the penstock's association with Ross is linked directly with the development of the NCHP in its entirety and cannot be represented by the penstock alone. As such, the penstock is not considered individually significant under Criterion B. When considered within the context of the NCHP's development and its significant association with Ross from 1918–1939, the penstock is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66) under Criterion B.

At the time of the NCHP's redevelopment, City Light was led by Superintendent John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines within the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. As such, the penstock is not considered to have significant associations with Nelson under Criterion B.

National Register of Historic Places Criterion C

The penstock was designed by City Light and built in 1921 by the Coast Culvert & Flume Company (CCFC). The penstock design—a single metal pipe for most of its alignment and

bifurcated at the powerhouse—was quite common by 1921 as a method of conveying water over longer distances than the penstock's alignment, with examples constructed by the Seattle Water Department as early as 1901 (Oldham 2010). While the penstock's method of construction did include the innovative use of arc welding in a remote area, documentation for its claim to be the first pipeline in the Northwest to employ such a construction method is not conclusive and the technique was otherwise commonly used for other purposes by this period, having been invented in the late 1800s (Buel 2020; Allen 1921:401). Furthermore, its overall design and relatively simple descending alignment did not require any other particularly innovative construction methods or engineering. The CCFC is not considered a master builder based on thresholds established by National Register Bulletin 15 (NPS 1995).

When considered within the context of the NCPDC's 1921 and 1969 designs, the penstock's engineering is considered significant. The 1921 NCPDC design was a significant example of an early 20th century hydroelectric facility constructed for the purpose of supplying power to construction camps associated with larger hydroelectric projects in its vicinity. Due to the mountainous nature of its setting and the distance between the headworks on Newhalem Creek and the powerhouse near the Skagit River, the penstock was a necessary and integral engineered component of the NCPDC's water conveyance system. It continued to function as such in the redeveloped NCHP. The penstock retains integrity to convey the significance of this system. The penstock is thus found to be a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the penstock is not considered to be individually significant in engineering under Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

National Register of Historic Places Criterion D

The penstock is a common example of its engineering type that provides no important information about the general trends of hydroelectric generation facility construction or design, or hydroelectric power generation that occurred in Washington during the 1910s and 1920s that cannot be obtained through documentary sources. Therefore, the penstock has not yielded and is not likely to yield information important in prehistory or history. For this reason, the penstock cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Integrity Analysis

Integrity is defined as the ability of a property to convey historic significance through its character-defining physical features, as expressed through integrity of location, setting, design, materials, workmanship, feeling, and association.

The penstock retains integrity in location and setting. The structure is in its original location and its alignment has not changed since it was built in 1921. While the Tunnel Portal Trail (The Skagit Project Emergency Access Trail) was developed within its vicinity in 1987 and a platform was built over the penstock near its fifth thrust block, the penstock's setting on a forested hillside within the RLNRA remains largely unchanged since the period of its construction. The penstock retains integrity in design. The structure has maintained its alignment from the power tunnel to the powerhouse and is visible in its linear rise on the forested hillside south of the powerhouse, as are its multiple concrete thrust blocks, and Dressler couplings at regular intervals. While

alterations have had a impact on its materials, these alterations have not changed the alignment, dimensions, placement on the hillside, or structural anchors and supports of its design. The replacement of the original timber saddles has affected its integrity of workmanship. However, the penstock displays evidence of the arc welding used in its 1921 construction throughout its alignment and the concrete thrust blocks display imprints of the wood boards used in their construction. The penstock retains integrity of feeling and association. Rising behind the powerhouse up the hillside, the penstock alignment, footprint, shape, and placement within a mountainous and forested environment is recognizable as an early 20th century pipeline. The penstock remains tied to this site, south and uphill of the powerhouse where it was built in 1921 as part of the NCPDC to convey water from the headworks on Newhalem Creek to the powerhouse for the generation of power and was reused in the 1969 redevelopment of the NCHP to continue supplying water to the powerhouse. As an intact component of the NHCP and until 2010, the penstock conveyed water for almost 90 years with limited interruptions.

Overall, the penstock meets the majority of the seven aspects of integrity. Though alterations to its features have somewhat diminished its integrity of design, materials, and workmanship, it retains integrity of location, setting, feeling, association, design, materials, and workmanship. The penstock retains sufficient overall integrity to convey its significance under Criteria A, B, and C as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendation

Eligibility as a District Contributor

The penstock is in the boundaries of the SRNCHP (DT 66) historic district, which was listed in the NRHP in 1996 (and updated in 2010) under Criteria A, B, and C with a period of significance of 1917–1961. The penstock was previously identified as a component to the Newhalem Creek Powerhouse Site, which was listed in the NRHP as a contributing resource to the SRNCHP (DT 66) in the district's Historic Area D, Single Non-Contiguous Resources (Erigero 1990:7-4; Johnson 2010:7-82).

This study reconsiders the Newhalem Powerhouse Site as a new historic area within the SRNCHP (DT 66) historic district, the Newhalem Creek Powerhouse and Dam Complex, with an expanded period of significance of 1918–1970, beginning with the planning and construction of the NCHP and ending with the year the reconstructed NCHP began producing power. The penstock is recommended eligible for listing in the NRHP as a contributor to the SRNCHP (DT 66) under Criteria A, B, and C, in the newly recommended historic area.

The penstock is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the development of the NCHP from 1918–1921 for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem, and with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as a support facility for the Gorge Powerhouse. The reconstruction of the powerhouse and headworks redevelopment following the 1966 fire represents City Light's commitment to the facility's continued operation, with power production resuming in 1970. Until it ceased production in 2010,

the NCHP was the oldest operating hydroelectric facility in the Skagit River area. The penstock retains integrity to convey this significance under Criterion A during the 1918–1970 period, representing both the NCHP's development from 1918–1921, as well as its redevelopment from 1967–1970 and continued operation thereafter.

The penstock is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion B, for its significant association with J.D. Ross, the Superintendent of City Light during the period of the NCPDC's original construction, who was involved substantially in the planning and construction of the SRHP and NCHP. The penstock's significance under Criterion B is limited to the 1918–1939 period, beginning with the start of planning and construction of the NCHP and ending at the end of Ross's tenure as Superintendent of City Light. As an intact original component of the NCPDC the penstock retains integrity to convey its significant association with Ross during that period.

The penstock is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion C as one component of the cohesive and intact collection of engineered components that comprise the NCPDC. As an original component, the penstock represents both the NCPDC's 1921 design and construction and the necessary and substantial improvements made in 1969 to the original engineering of the NCPDC, including the reconstruction of the powerhouse, which ensured its continued operation and secured an increased and better regulated source of water for hydroelectric production. As a functional and integral component of the NCPDC, City Light chose to retain the penstock as part of the redeveloped system. The penstock retains integrity to convey its engineering significance under Criterion C as a component of both the NCPDC's original 1921 and redeveloped 1969 designs.

Individual NRHP Eligibility

The penstock is significant under Criterion A and retains integrity to convey this significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the penstock alone. Thus, in the absence of individual significance, regardless of physical condition, the penstock cannot be considered to have integrity that conveys individual significance under Criterion A and is recommended not eligible for individual listing in the NRHP under Criterion A.

The penstock is significant under Criterion B and retains integrity to convey this significance, as discussed previously. However, the penstock's association with Ross is linked directly with the development of the NCHP in its entirety and cannot be represented solely by the penstock. Thus, in the absence of individual significance, regardless of physical condition, the penstock cannot be considered to have integrity that conveys individual significance under Criterion B and is recommended not eligible for individual listing in the NRHP under Criterion B.

The penstock is significant under Criterion C and retains integrity to convey this significance, as discussed previously. However, the significance of its engineering is derived from its context within the initial NCPDC's design and function in 1921 and redeveloped NCPDC's design and function in 1969 that cannot be represented solely by the penstock. Thus, in the absence of individual significance, regardless of physical condition, the penstock cannot be considered to have integrity that conveys individual significance under Criterion C and is recommended not eligible for individual listing in the NRHP under Criterion C.

The penstock lacks the ability to yield information important to prehistory or history and, thus, cannot be considered to have individual significance under Criteria D. Thus, in the absence of individual significance, regardless of physical condition, the penstock cannot be considered to have integrity that conveys individual significance under Criterion D and is recommended not eligible for individual listing in the NRHP under Criterion D.

Physical description:

The penstock consists of 925 feet of large diameter metal pipe descending from the power tunnel to the powerhouse on a north–northwest alignment. The penstock's southern end point was placed 218 feet inside the power tunnel's northern entrance, and it proceeds 707 feet downhill to the powerhouse after daylighting from the tunnel. The penstock's southern end has a pipe intake bell and is surrounded by a concrete plug, which seals the penstock to the power tunnel and forces water into the penstock. From the power tunnel to the base of the powerhouse (southern elevation), the penstock consists of a single metal pipe. The inside of the penstock has a metal grate to prevent debris from flowing into and ultimately down into the powerhouse turbine. The diameter of the penstock gradually decreases over its alignment down the hill toward the powerhouse while its thickness increases to address issues related to pressure. Dresser couplings connect the penstock's approximately 20' long segments at regular intervals. The penstock is supported along its downhill alignment by U-shaped poured concrete saddles, placed at regular short intervals between the thrust blocks. Six rectangular poured concrete thrust blocks were constructed around the single penstock as it descends from the power tunnel toward the powerhouse. The first thrust block is outside the northern entrance of the power tunnel, with four thrust blocks placed at regular intervals along the penstock's downhill alignment, ending in the sixth thrust block at the base of the powerhouse (south side). A rectangular extension added to its south side was added to this thrust block in 1970, which contains conduit associated with the powerhouse fire suppression system accessed by a metal hatch. It is there that the penstock splits into two separate pipes, each entering the powerhouse at the base of its south side to convey water to the pair of Pelton waterwheels inside. Due to its subterranean nature, the portion of the penstock in the power tunnel could not be documented. A wood platform has been constructed over penstock at the top of the hill's first rise, just to the north of its fifth thrust block. The penstock is in good condition.

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Historic Property Report

Historic Name: Tailrace

Property ID: 729314

Location

Address: Newhalem, Washington

Geographic Areas: DIABLO DAM Quadrangle, T37R12E28, Whatcom County

Information

Number of stories: N/A

Construction Dates:

Construction Type	Year	Circa
Built Date	1921	☐
Remodel	1990	☑

Historic Use:

Category	Subcategory
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility

Historic Context:

Category

Architect/Engineer:

Category	Name or Company
Engineer	City of Seattle, Department of City Light

Historic Property Report

Historic Name: Tailrace

Property ID: 729314

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

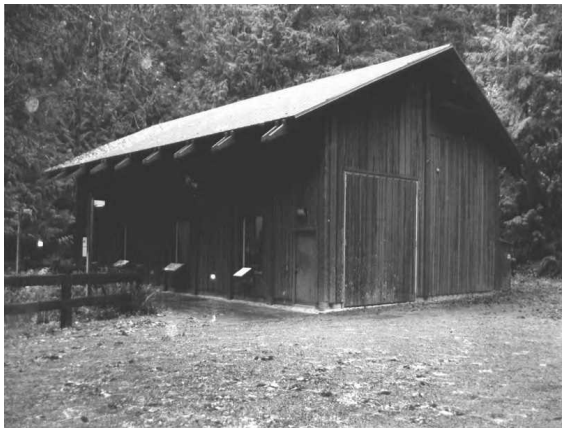
Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2021-08-05085, , Newhalem Creek Hydroelectric Project Decommissioning		Survey/Inventory	

Photos

Tailrace discharge channel in 2022, facing north from the powerhouse.

Tailrace in 1968 after 1966 fire, discharge channel in background, facing north.

Tailrace in 1968 after 1966 fire with 1921 powerhouse discharge chute flumes in foreground, facing south.



Powerhouse in 2010, tailrace fencing at left, facing southeast.

Tailrace fish barrier, facing south.

Tailrace fish barrier, facing west from the observation platform.

Historic Property Report

Historic Name: Tailrace Property ID: 729314

Inventory Details - 9/26/2022

Common name:

Date recorded: 9/26/2022

Field Recorder: Corey Lentz; Will Linder; January Tavel

Field Site number:

SHPO Determination

Detail Information

Surveyor Opinion

Property is located in a potential historic district (National and/or local): Yes

Property potentially contributes to a historic district (National and/or local): No

Significance narrative: This inventory recommends the Newhalem Creek Powerhouse and Dam Complex (NCPCD) tailrace (hereafter referred to as the tailrace), located near the town of Newhalem in Whatcom County, Washington, not eligible for individual listing in the NRHP under Criteria A, B, C, or D and not eligible for listing in the NRHP as a contributor to the Skagit River and Newhalem Creek Hydroelectric Projects (SRNCHP) (DT 66) under Criteria A, B, C, or D. Supporting analysis is provided in the historic context, eligibility evaluation (significance analysis, integrity analysis, and eligibility recommendation statement), and physical description herein.

Historic Context

Prior to the development of the City of Seattle, City Light Department's (City Light) Skagit River Hydroelectric Project (SRHP), the upper Skagit River was a remote and rugged area in Whatcom County where Native American groups had lived for millennia. What eventually became the town of Newhalem was part of an extended Upper Skagit village system called k'wabacábš. Oral history and archaeological evidence indicate that the area around the powerhouse was important for hunting, gathering, and fishing (Mierendorf 1996). Euro-American miners began travelling upriver in the 1880s in search of gold, constructing rudimentary cabins at their claim sites. By the 1890s, a few homesteaders had settled along upper Skagit River in the vicinity of the future site of Newhalem to provision miners with supplies, but by the time City Light sought to develop the area as a potential site of hydroelectric power in the 1910s, the upper Skagit River remained remote and sparsely populated by Euro-Americans. (Johnson 2010:8-2–8-4).

As part of the planning process for SRHP, City Light determined it needed a small temporary hydroelectric facility sited near the work camp and construction site. This facility, the Newhalem Creek Hydroelectric Project (NCHP), was constructed on Newhalem Creek, a tributary off the south side of the Skagit River southwest of present day Newhalem. The construction of the NCHP was a perquisite for the construction of first SRHP facility, the Gorge Powerhouse and Dam Complex (GPDC), as the plant would provide power to the construction camp that would serve as headquarters of the SRHP and would later become the town of Newhalem. The site of the NCPDC was surveyed and selected for the proposed temporary facility in the summer of 1918. (Johnson 2010:8-5).

Construction materials were transported from City Camp (present-day Town of

Newhalem) to the powerhouse site using construction methods common to logging during the early 20th century. City Light constructed a cableway skidding system (also referred to as an overhead system) feeder from the railway on the north bank of the river to the powerhouse site, with which was a cableway skidding system (also referred to as an overhead system) used to move materials across the river just to the west of the suspension bridge (City Light 1919f, 1920a; Bryant 1923:504). This overhead system consisted of a set of two poles connected by a cross bar (referred to as a head spar tree) on each bank of the river, with the northern head spar tree additionally supported by a central strut (City Light 1920a; Bryant 1923:504). A cable ran between each head spar tree, with winches on either side to facilitate the movement of the traveler (the device that held materials) along the cable (City Light 1920a). This system remained in place just north of the suspension bridge through at least 1937 but was removed by the early 1950s (Figure 5) (City Light 1937 n.d.a.). After materials crossed the river, they were transported west to the powerhouse along the skid road. A skidder—a device powered by steam or electricity that operates on or near a railroad track, which moves materials by means of a cable—was installed on the hill to the east and behind the powerhouse to transport construction materials uphill from the powerhouse site to build the penstock (City Light 1920f; Bryant 1923:504).

The headworks site was accessed by a pedestrian trail, known as the Gatehouse Trail, which ascended the adjacent hillside on southwestern alignment from the powerhouse toward Newhalem Creek, and then proceeded west and south above and to the east of Newhalem creek (City Light 1920e). The alignment of the Gatehouse Trail was depicted in City Light's April of 1920 Drawing No. B-55 and again in the NCHP's 1969 FERC license application, though the trail was not explicitly identified in the latter (City Light 1920g). Construction materials for the 1921 headworks' timber crib dam and intake/gatehouse structure were sourced directly from the headworks site and surrounding area (City of Seattle 1969:Exhibit Q-1).

The NCPDC was completed in 1921, with power first produced in August of that year (Johnson 2010:7-44, 8-5). The 1921 NCPDC included a headworks on Newhalem Creek approximately one mile upstream from its confluence with the Skagit River, power tunnel, penstock, powerhouse, tailrace, and transmission line. The 1921 headworks' low log crib diversion dam that directed water into a vertical timber intake structure east of the dam connected to the power tunnel by a 55-foot-tall, 5-foot by 5-foot vertical rock shaft (City Light 1921a, 1921b, 2022:1-1; Johnson 2010:8-5). From the intake, water flowed north–northwest underground through the 2,452 feet long bored power tunnel (Johnson 2010:8-5; City Light 2022:1-1). Below ground, the power tunnel funneled water via a pipe intake bell surrounded by a concrete plug into the 925-foot penstock, of which 218 feet were located within the rock tunnel and the remaining 707 feet ran downhill to the powerhouse after daylighting from the rock tunnel (City Light 1919b; 2022:1-1; Johnson 2010:8-5). Along its descending alignment, the penstock was supported by U-shaped timber saddles, placed at regular short intervals between six thrust blocks (City Light 1920c). The penstock split as it entered the powerhouse to service each of the plant's Pelton Water Wheel Company (PWWC) double-nozzle impulse-type waterwheels, which powered a 2,000- kilovolt amperes (kVA) Westinghouse generator (City Light 1920c; Johnson 2010:8-5; Engineering World 1920:314). Water was discharged from the powerhouse into the tailrace, which ran north to the Skagit River (Roberts 1924:952; Johnson 2010:8-5). The original 1921 NCPDC powerhouse was a rustic wood framed building with board-and-batten siding, a corrugated metal roof, and a series of wood-sashed windows along its north façade (City Light 1919a). A 6600-volt aboveground transmission line transmitted power from the powerhouse, which ran northwest over

the Skagit River to the rail line in Newhalem, and then northeast to the GPDC construction site (City Light 1921c).

The NCHP provided power to the buildings of the City Camp (later Newhalem), as well as the construction of both the Gorge power tunnel and powerhouse. These competing demands on the facility's limited capacity led to power shortages and delays in the construction of the GPDC (Johnson 2010:8-6). City Light initially intended the NCHP to be a temporary facility to facilitate the construction of the City Camp and the GPDC (Johnson 2010:8-5). However, the facility remained in operation following the completion of the GPDC in 1924, with its output then routed into the larger Skagit transmission and distribution network. In this new role as a local production and support facility, the NCHP provided power for the town of Newhalem and station service power for the Gorge Powerhouse's electrically operated equipment (e.g., heating, lighting and cooling). The NCHP was semi-automated in the early 1950s, allowing it to operate largely unmanned, with manual start-up and shut-down still required (Johnson 2010:8-5). City Light redeveloped the transmission line from the powerhouse to the Gorge Powerhouse in 1965, undergrounding most of the line within the town of Newhalem and rerouting it along the north bank of the Skagit River (City Light 1965a, 1965b).

A fire in July 1966 severely damaged the powerhouse. It burned down the building, but a flange gasket in one line of the bifurcated penstock behind the powerhouse blew out, creating a 60- to 70-foot-high sheet of water behind the powerhouse preventing fire damage in the surrounding wooded area. Additionally, the equipment within the powerhouse continued to run, saving the original PWWC turbines and Westinghouse generator from warping from the heat of the fire. (Johnson 2010:8-5). After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. In 1968 City Light replaced a log stringer bridge over Newhalem Creek on Powerhouse Road with the current Newhalem Creek Bridge to access the powerhouse from the west (City Light 1968; City of Seattle 1969:Exhibit N).

The current powerhouse was constructed between 1967 and 1969 (Johnson 2010:7-44). The only major repair on the generating equipment was the rewinding of the Westinghouse generator and minor welding repair to the two PWWC turbines (Johnson 2010:8-5). The existing headworks on Newhalem Creek was also rebuilt during this period. The 1969 headworks consisted of a curved diversion dam and apron, rectangular sluice way/channel, intake and rock shaft, gatehouse, and associated concrete slabs around the gatehouse; the 1969 headworks retained the existing log footbridge that crossed from the western bank access road to the gatehouse on the eastern bank (City Light 1969a, 1969b). The redeveloped NCHP retained and continued to utilize the original power tunnel, penstock, and tailrace, which required only minor maintenance and repairs following the fire. Before going back online in 1970, the NCHP was fully automated, the first of the Skagit River facilities to undergo the process, and remote control of the newly operational powerhouse equipment was established at the Gorge Powerhouse. (Johnson 2010:7-44, 8-5, 8-46; City Light 1971:11).

The NCHP was relicensed in 1997 and continued to operate until 2010 (City Light 1992, 2022c:A-5). The NCHP has not been consistently in service since 2010 due to an automatic gate valve requiring repairs. While equipment and structural issues resulting in the 2010 shutdown were eventually addressed, subsequent issues necessitated the current decommissioning of the NCHP. In 2015, a wildfire burned many of the original wooden penstock saddles, requiring an extensive replacement project in 2016-2017.

More recently, leaks in the power tunnel, maintenance needs at the headworks and powerhouse, and access road safety concerns prohibit the continued operation of the NCHP. In 2021, City Light began the process of surrendering the facility's license (City Light 2022c:vi).

Skagit River and Newhalem Creek Hydroelectric Projects NRHP Listing

The SRNCHP (DT 66) was listed in the NRHP in 1996, with the nomination updated in 2010 (Erigero 1990; Johnson 2010). As of 2010, the SRNCHP (DT 66) is listed in the NRHP as significant at the national level under Criteria A, B, and C and has a period of significance of 1917–1961, beginning in the year the SRHP was first conceptualized by City Light and ending with the completion of the Gorge High Dam. The district is listed under Criterion A, in the area of Politics and Government, because it represents almost 50 years of American utility politics and development from the Progressive Era through the decades following World War II. The projects' development ensured the existence of City Light as a municipal utility and was immensely influential on the public power movement over the course of the 20th century. The district is listed under Criterion B, in the areas of Politics and Government, Entertainment/Recreation, and Landscape Architecture, for its association with J.D. Ross, City Light Superintendent for 28 years, and Ross's vision for City Light and public power, in particular hydroelectric power. Ross was instrumental in the projects' development, but also used the projects as a showcase to promote hydroelectric power and municipal utility ownership. The district is also listed under Criterion C, in the areas of Community Planning and Development, Engineering, Architecture, and Transportation for its representation of a general trend of developing more costly and remote hydroelectric sites in the 1920s and for its new and inventive engineering practices, both in the technical construction of the facilities themselves, as well as in the development of municipally owned towns (Newhalem and Diablo, Washington) and the transportation infrastructure required for their construction (Johnson 2010:8-1–8-2).

The historic district is three miles long and extends in a discontiguous linear manner along the north and south banks of, over and across the Skagit River within the Ross Lake National Recreation Area (RLNRA). Starting in Newhalem and extending east to Ross Dam, it includes the sequence of towns and industrial resources related to the SRNCHP (DT 66) and is grouped into seven discrete historic areas: Historic Area A – Town of Newhalem; Historic Area B – Gorge Powerhouse and Dam Complex; Historic Area C – Diablo Powerhouse Complex; Historic Area D Discontiguous Resources – Diablo Lake; Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site; Historic Area E – Ross Powerhouse and Dam Complex; and Historic Area F – Hollywood Residential Area. The lakes formed by the dams are not included in the district. (Johnson 2010:7-2).

Property Development

The tailrace is on the south side of the Skagit River and the town of Newhalem in Whatcom County, Washington. It is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA. The tailrace was constructed in 1921 based on plan by City Light; however, available documentation does not specify the engineer or contractor responsible for the design or construction of the tailrace (City Light 1919d).

The 1921 tailrace consisted of an excavated discharge channel extending from the powerhouse to the Skagit River along the alignment of a pre-existing intermitted stream

(City Light 2022:E-2). The discharge channel ran in a meandering alignment north from the powerhouse to the Skagit River. A pair of discharge chutes flumes extended out from beneath the north side of the powerhouse into the tailrace (City Light 1919a, 1919d).

Based on available documentation, City Light utilized the 1921 tailrace in the 1969 redevelopment of the NCHP. The tailrace was not specifically documented in the Historic American Engineering Record (HAER) documentation that was completed for the powerhouse in 1987 or in the 1996 NRHP nomination listing for the SRNCHP (DT 66) or the 2010 nomination update. However, the northern end of the tailrace in the vicinity of the powerhouse was photographed as part of these documentation efforts. Alterations were made to the powerhouse and its landscape features in the immediate vicinity of the tailrace in 2000, including alterations to the portions of the powerhouse's discharge chutes within the tailrace and surrounding fencing (City Light 2000a, 2000b). However, no direct alterations to the south end of the excavated but otherwise natural tailrace discharge channel were documented in 1987, 1990, or 2010 (NPS 1987; Erigero 1990: Photo 64; Johnson 2010: File No. 4234).

The fish barrier was constructed circa 2000 at the north end of the tailrace. Its construction was requested by NPS and included as mitigation for the NCHP's 1997 FERC relicensing (Louter 2023). Since the construction of the fish barrier, it does not appear that further alterations have been made to the tailrace. This fish barrier, a stepped concrete barrier stretching across the width of the tailrace, was photographed for the first time in this documentation. An elevated viewing area accessed from the Trail of the Cedars and fenced with wood post and rail is adjacent to the east side of the barrier, likely constructed in conjunction with the fish barrier in 2000.

National Register of Historic Places Eligibility Evaluation

Significance Analysis

National Register of Historic Places Criterion A

The tailrace has significant associations with the 1918–1921 development of the NCHP for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem. It is also significant with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and station service power backup for the Gorge Powerhouse (Johnson 2010:8-46). The tailrace is one of three extant components of the NCPDC from 1921, the others being the penstock and power tunnel. Due to a fire in 1966, it was necessary to reconstruct the powerhouse to continue operation of the NCHP; the headworks was redeveloped during this period as well (Johnson 2010:8-5). The tailrace continued to function as a water conveyance component of the redeveloped NCPDC. The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5). Though the tailrace has its significant historic associations under Criterion A, the property has been substantially altered since its construction (see Integrity Analysis for a more robust description). As such, the tailrace lacks integrity to convey this significance and is not considered significant under Criterion A, individually or as a contributor to the NCPDC historic area and the SRNCHP (DT 66).

National Register of Historic Places Criterion B

The tailrace has significant associations with J.D. Ross, a person of regional and national significance for his 28-year tenure as superintendent of City Light over the agency's three decades, during which he was involved substantially in the planning and construction of the NCHP and SRHP, and for his work promoting hydroelectric power in the region and nationally (Johnson 2010: 8-50–8-51, 8-62–8-63). Though the tailrace has significant historic associations under Criterion B, the property has been substantially altered since its construction. As such, the tailrace lacks integrity to convey this significance and is not considered significant under Criterion B. Thus, the tailrace is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

National Register of Historic Places Criterion C

The tailrace was constructed based on plan by City Light; however, available documentation does not specify the engineer or contractor responsible for the design or construction of the tailrace. As originally constructed, the design of the tailrace—an excavated discharge channel—was quite common by 1921 for conveying water out of hydroelectric facilities back to primary waterways and its overall design and simple meandering alignment did not require any other particularly innovative construction methods or engineering (Soderberg 1988a:F-6).

When considered within the context of the NCPDC's 1921 and 1969 designs, the tailrace's engineering is considered significant as it represents a necessary engineered component of the NCPDC's water conveyance system and continued to function as part of the redeveloped NCHP. However, the tailrace does not retain integrity to convey the significance of this system. Thus, the tailrace is not eligible as a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C.

However, the tailrace is not considered to be individually significant in engineering under Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

National Register of Historic Places Criterion D

The tailrace is a common example of its engineering type that provides no important information about the general trends of hydroelectric generation facility construction or design, or hydroelectric power generation that occurred in Washington during the 1910s and 1920s that cannot be obtained through documentary sources. Therefore, the tailrace has not yielded and is not likely to yield information important in prehistory or history and is not considered significant under Criterion D. For this reason, the tailrace cannot be a district contributor or individually considered significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Integrity Analysis

Integrity is defined as the ability of a property to convey historic significance through its character-defining physical features, as expressed through integrity of location, setting, design, materials, workmanship, feeling, and association.

The tailrace retains integrity in location and setting. The site remains in its original location and its alignment has not changed since it was built in 1921. The tailrace's setting within a forested area between the powerhouse and Skagit River remains largely

unchanged since its construction in 1921. The adjacent segment of the Trail of the Cedars was developed in 1969, and more recently, improvements have been made to the surrounding trail system and new small-scale features such as interpretive trail signage have been introduced. However, these changes have had a limited impact on the tailrace's overall setting.

The tailrace's integrity of design, materials, and workmanship has been affected by alterations, including the expansion of the powerhouse's discharge chutes that enclosed the northern end of the channel and the addition of a fish barrier and viewing platform at its southern end. However, the tailrace's channel's alignment and dimensions, and the design of secondary features such as the wood fencing have remained intact. These alterations have introduced new materials into the excavated but generally natural intermittent stream of tailrace. While the fish barrier was an approved project as part of the NCHP's 1997 FERC license, it conflicts with applicable standards of the 1998 Newhalem Creek Hydroelectric Project FERC No. 2705 Historic Resources Management Plan, as the barrier is not compatible in materials with the otherwise natural channel of the tailrace (City Light 1992:454, 1998:20). Therefore, this particular alteration is considered a modification to the tailrace that has a substantial impact on its integrity of materials, and to a lesser extent its design. Workmanship is an aspect of integrity not generally applicable to the tailrace, given its simple construction through excavation of a natural intermittent streambed. The tailrace's integrity of feeling as an excavated but generally natural intermittent stream in a mountainous and forested environment have likewise been affected by its alterations.

The tailrace retains integrity of association, as it has remained in its a forested, intermittent creek and riverside environment north of the powerhouse where it was built in 1921 as part of the NCPDC to convey water discharged from the powerhouse to the Skagit River. The tailrace was in continuous use until 2010 when the powerhouse ceased operation. Although the tailrace's alterations have affected its association with the NCPDC, the property through its proximity to the extant powerhouse and the introduction of interpretive signage in the tailrace's vicinity noting its history within the NCPDC, continues to maintain its association with the NCPDC. While its alterations have somewhat diminished its association with the NCHP, the property maintains its association with the NCHP through its proximity to the extant powerhouse and the introduction of interpretive signage in the tailrace's vicinity indicating its past function as part of the NCHP.

Overall, the tailrace does not meet the majority of the seven aspects of integrity. While it retains integrity in location, setting, and association, alterations to the property have affected its integrity of design, materials, workmanship, and feeling to such a degree that the tailrace does not retain sufficient overall integrity to convey its significance under Criteria A and B as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendation

Eligibility as a District Contributor

The tailrace is within the boundaries of the SRNCHP (DT 66) historic district, which was listed in the NRHP in 1996 (and updated in 2010) under Criteria A, B, and C with a period of significance of 1917–1961. The tailrace was not previously identified as a component of the Newhalem Creek Powerhouse Site, which was listed in the NRHP as a contributing resource to the SRNCHP (DT 66) within the district's Historic Area D, Single Non-

Contiguous Resources (Erigero 1990:7-4; Johnson 2010:7-82).

This study reconsiders the Newhalem Powerhouse Site as a new historic area within the SRNCHP (DT 66) historic district, the Newhalem Creek Powerhouse and Dam Complex (NCPDC), with an expanded period of significance of 1918–1970, beginning with the planning and construction of the NCHP and ending with the year the reconstructed NCHP began producing power. The tailrace is not recommended as a contributor to SRNCHP (DT 66) in the newly recommended historic area.

The tailrace is not recommended as a contributor to the SRNCHP (DT 66) under Criterion A, B, or C. While the tailrace has significant historic associations with NCHP's 1918-1921 development and 1967–1970 redevelopment, with J.D. Ross, and engineering significance as a necessary component of both the 1921 and 1969 designs, the tailrace does not retain integrity to convey its significance.

Individual NRHP Eligibility

The tailrace has significant associations under Criteria A, B, C as discussed previously. However, the tailrace does not retain integrity to convey these significant associations. Furthermore, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the tailrace alone. The tailrace also lacks the ability to yield information important to prehistory or history and, thus, cannot be considered to have individual significance under Criterion D. Thus, in the absence of individual significance, regardless of physical condition, the tailrace cannot be considered to have integrity that conveys individual significance under Criteria A, B, C, or D. As such, the tailrace is recommended not eligible for individual listing in the NRHP under any Criteria.

Physical description:

The tailrace is an excavated water channel that carries water away from the powerhouse after its turbines have produced power. The tailrace is north of the powerhouse and south of the Skagit River and is part of an intermitted stream. The powerhouse's concrete discharge chute flume structure extends 24 feet into the tailrace, just north of the powerhouse. The tailrace channel is open, measuring approximately 350 feet long by 18 feet wide, extending to the fish barrier at its north end, near the Skagit River. (City Light 2022a:A-4). Within the tailrace channel and extending from the discharge flumes, the tailrace channel proceeds on a meandering alignment north to the Skagit River. The tailrace channel appears excavated with no additional materials lining it or with added features, such as retaining walls. However, wood post and rail fencing has been constructed at both ends of the tailrace banks: around the eastern, northern and western banks of the tailrace channel north of the powerhouse; and the eastern side of the fish barrier nearing the channel's northern end. The fish barrier is a stepped concrete structure, measuring 3.6-feet high by 18-feet wide, with 22.5-foot-long wing walls (City Light 2022a:A-4). The portion of the wing walls south of the central step are rectangular and angle outward toward the edges of the discharge channel, while the portions north of the step are trapezoidal and run parallel. The natural stream of the tailrace is overgrown with vegetation and shows some evidence of bank erosion but is otherwise in fair condition and the fish barrier is in good condition. These are the only documented alterations to the tailrace.

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Historic Property Report

Historic Name: Transmission Line

Property ID: 729315

Location

Address: Newhalem, Washington

Geographic Areas: Whatcom County, T37R12E21

Information

Number of stories: N/A

Construction Dates:

Construction Type	Year	Circa
Built Date	1965	☐
Remodel	2000	☐

Historic Use:

Category	Subcategory
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility
Industry/Processing/Extraction	Industry/Processing/Extraction - Energy Facility

Historic Context:

Category

Architect/Engineer:

Category	Name or Company
Engineer	City of Seattle, Department of City Light

Historic Property Report

Historic Name: Transmission Line

Property ID: 729315

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2021-08-05085, , Newhalem Creek Hydroelectric Project Decommissioning		Survey/Inventory	

Photos

Transmission line northern bank pole triplet and overhead lines, facing south.

Transmission line Skagit River crossing in Newhalem in 1969, facing east.

Transmission line Skagit River crossing in vicinity of the powerhouse in 1969, facing north.

Transmission line conduit on Gorge Pedestrian Suspension Bridge in 2010, facing northwest.

Transmission line transformers at powerhouse, facing south.

Transmission line southern bank pole triplet and overhead lines, facing west.

Transmission line detail view of vertical conduits on southern bank pole triplet and overhead lines, facing west.

Transmission line conduit seen on south (right) side of Gorge Pedestrian Suspension Bridge.

Transmission line Newhalem access vault east of Gorge inn, facing west.

Transmission line Newhalem access vault, facing northeast along Silk Stocking Road.

Historic Property Report

Historic Name: Transmission Line Property ID: 729315

Inventory Details - 9/26/2022

Common name:

Date recorded: 9/26/2022

Field Recorder: Corey Lentz; Will Linder; January Tavel

Field Site number:

SHPO Determination

Detail Information

Surveyor Opinion

Property is located in a potential historic district (National and/or local): Yes

Property potentially contributes to a historic district (National and/or local): No

Significance narrative: This inventory recommends the Newhalem Creek Powerhouse and Dam Complex (NCPCD) transmission line (hereafter referred to as the transmission line), located across and within the town of Newhalem in Whatcom County, Washington, not eligible for individual listing in the NRHP under Criteria A, B, C, or D and not eligible for listing in the NRHP as a contributor to the Skagit River and Newhalem Creek Hydroelectric Projects (SRNCHP) (DT 66) under Criteria A, B, C, or D. Supporting analysis is provided in the historic context, eligibility evaluation (significance analysis, integrity analysis, and eligibility recommendation statement), and physical description herein.

Historic Context

Prior to the development of the City of Seattle, City Light Department's (City Light) Skagit River Hydroelectric Project (SRHP), the upper Skagit River was a remote and rugged area in Whatcom County where Native American groups had lived for millennia. What eventually became the town of Newhalem was part of an extended Upper Skagit village system called k'wabacábš. Oral history and archaeological evidence indicate that the area around the powerhouse was important for hunting, gathering, and fishing (Mierendorf 1996). Euro-American miners began travelling upriver in the 1880s in search of gold, constructing rudimentary cabins at their claim sites. By the 1890s, a few homesteaders had settled along upper Skagit River in the vicinity of the future site of Newhalem to provision miners with supplies, but by the time City Light sought to develop the area as a potential site of hydroelectric power in the 1910s, the upper Skagit River remained remote and sparsely populated by Euro-Americans. (Johnson 2010:8-2–8-4).

As part of the planning process for SRHP, City Light determined it needed a small temporary hydroelectric facility sited near the work camp and construction site. This facility, the Newhalem Creek Hydroelectric Project (NCHP), was constructed on Newhalem Creek, a tributary off the south side of the Skagit River southwest of present day Newhalem. The construction of the NCHP was a perquisite for the construction of first SRHP facility, the Gorge Powerhouse and Dam Complex (GPDC), as the plant would provide power to the construction camp that would serve as headquarters of the SRHP and would later become the town of Newhalem. The site of the NCPDC was surveyed and selected for the proposed temporary facility in the summer of 1918. (Johnson 2010:8-5).

Construction materials were transported from City Camp (present-day Town of

Newhalem) to the powerhouse site using construction methods common to logging during the early 20th century. City Light constructed a cableway skidding system (also referred to as an overhead system) feeder from the railway on the north bank of the river to the powerhouse site, with which was a cableway skidding system (also referred to as an overhead system) used to move materials across the river just to the west of the suspension bridge (City Light 1919f, 1920a; Bryant 1923:504). This overhead system consisted of a set of two poles connected by a cross bar (referred to as a head spar tree) on each bank of the river, with the northern head spar tree additionally supported by a central strut (City Light 1920a; Bryant 1923:504). A cable ran between each head spar tree, with winches on either side to facilitate the movement of the traveler (the device that held materials) along the cable (City Light 1920a). This system remained in place just north of the suspension bridge through at least 1937 but was removed by the early 1950s (Figure 5) (City Light 1937 n.d.a.). After materials crossed the river, they were transported west to the powerhouse along the skid road. A skidder—a device powered by steam or electricity that operates on or near a railroad track, which moves materials by means of a cable—was installed on the hill to the east and behind the powerhouse to transport construction materials uphill from the powerhouse site to build the penstock (City Light 1920f; Bryant 1923:504).

The headworks site was accessed by a pedestrian trail, known as the Gatehouse Trail, which ascended the adjacent hillside on southwestern alignment from the powerhouse toward Newhalem Creek, and then proceeded west and south above and to the east of Newhalem creek (City Light 1920e). The alignment of the Gatehouse Trail was depicted in City Light's April of 1920 Drawing No. B-55 and again in the NCHP's 1969 FERC license application, though the trail was not explicitly identified in the latter (City Light 1920g). Construction materials for the 1921 headworks' timber crib dam and intake/gatehouse structure were sourced directly from the headworks site and surrounding area (City of Seattle 1969:Exhibit Q-1).

The NCPDC was completed in 1921, with power first produced in August of that year (Johnson 2010:7-44, 8-5). The 1921 NCPDC included a headworks on Newhalem Creek approximately one mile upstream from its confluence with the Skagit River, power tunnel, penstock, powerhouse, tailrace, and transmission line. The 1921 headworks' low log crib diversion dam that directed water into a vertical timber intake structure east of the dam connected to the power tunnel by a 55-foot-tall, 5-foot by 5-foot vertical rock shaft (City Light 1921a, 1921b, 2022:1-1; Johnson 2010:8-5). From the intake, water flowed north–northwest underground through the 2,452 feet long bored power tunnel (Johnson 2010:8-5; City Light 2022:1-1). Below ground, the power tunnel funneled water via a pipe intake bell surrounded by a concrete plug into the 925-foot penstock, of which 218 feet were located within the rock tunnel and the remaining 707 feet ran downhill to the powerhouse after daylighting from the rock tunnel (City Light 1919b; 2022:1-1; Johnson 2010:8-5). Along its descending alignment, the penstock was supported by U-shaped timber saddles, placed at regular short intervals between six thrust blocks (City Light 1920c). The penstock split as it entered the powerhouse to service each of the plant's Pelton Water Wheel Company (PWWC) double-nozzle impulse-type waterwheels, which powered a 2,000- kilovolt amperes (kVA) Westinghouse generator (City Light 1920c; Johnson 2010:8-5; Engineering World 1920:314). Water was discharged from the powerhouse into the tailrace, which ran north to the Skagit River (Roberts 1924:952; Johnson 2010:8-5). The original 1921 NCPDC powerhouse was a rustic wood framed building with board-and-batten siding, a corrugated metal roof, and a series of wood-sashed windows along its north façade (City Light 1919a). A 6600-volt aboveground transmission line transmitted power from the powerhouse, which ran northwest over

the Skagit River to the rail line in Newhalem, and then northeast to the GPDC construction site (City Light 1921c).

The NCHP provided power to the buildings of the City Camp (later Newhalem), as well as the construction of both the Gorge power tunnel and powerhouse. These competing demands on the facility's limited capacity led to power shortages and delays in the construction of the GPDC (Johnson 2010:8-6). City Light initially intended the NCHP to be a temporary facility to facilitate the construction of the City Camp and the GPDC (Johnson 2010:8-5). However, the facility remained in operation following the completion of the GPDC in 1924, with its output then routed into the larger Skagit transmission and distribution network. In this new role as a local production and support facility, the NCHP provided power for the town of Newhalem and station service power for the Gorge Powerhouse's electrically operated equipment (e.g., heating, lighting and cooling). The NCHP was semi-automated in the early 1950s, allowing it to operate largely unmanned, with manual start-up and shut-down still required (Johnson 2010:8-5). City Light redeveloped the transmission line from the powerhouse to the Gorge Powerhouse in 1965, undergrounding most of the line within the town of Newhalem and rerouting it along the north bank of the Skagit River (City Light 1965a, 1965c).

A fire in July 1966 severely damaged the powerhouse. It burned down the building, but a flange gasket in one line of the bifurcated penstock behind the powerhouse blew out, creating a 60- to 70-foot-high sheet of water behind the powerhouse preventing fire damage in the surrounding wooded area. Additionally, the equipment within the powerhouse continued to run, saving the original PWWC turbines and Westinghouse generator from warping from the heat of the fire. (Johnson 2010:8-5). After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. In 1968 City Light replaced a log stringer bridge over Newhalem Creek on Powerhouse Road with the current Newhalem Creek Bridge to access the powerhouse from the west (City Light 1968; City of Seattle 1969:Exhibit N).

The current powerhouse was constructed between 1967 and 1969 (Johnson 2010:7-44). The only major repair on the generating equipment was the rewinding of the Westinghouse generator and minor welding repair to the two PWWC turbines (Johnson 2010:8-5). The existing headworks on Newhalem Creek was also rebuilt during this period. The 1969 headworks consisted of a curved diversion dam and apron, rectangular sluice way/channel, intake and rock shaft, gatehouse, and associated concrete slabs around the gatehouse; the 1969 headworks retained the existing log footbridge that crossed from the western bank access road to the gatehouse on the eastern bank (City Light 1969a, 1969b). The redeveloped NCHP retained and continued to utilize the original power tunnel, penstock, and tailrace, which required only minor maintenance and repairs following the fire. Before going back online in 1970, the NCHP was fully automated, the first of the Skagit River facilities to undergo the process, and remote control of the newly operational powerhouse equipment was established at the Gorge Powerhouse. (Johnson 2010:7-44, 8-5, 8-46; City Light 1971:11).

The NCHP was relicensed in 1997 and continued to operate until 2010 (City Light 1992, 2022c:A-5). The NCHP has not been consistently in service since 2010 due to an automatic gate valve requiring repairs. While equipment and structural issues resulting in the 2010 shutdown were eventually addressed, subsequent issues necessitated the current decommissioning of the NCHP. In 2015, a wildfire burned many of the original wooden penstock saddles, requiring an extensive replacement project in 2016-2017.

More recently, leaks in the power tunnel, maintenance needs at the headworks and powerhouse, and access road safety concerns prohibit the continued operation of the NCHP. In 2021, City Light began the process of surrendering the facility's license (City Light 2022c:vi).

Skagit River and Newhalem Creek Hydroelectric Projects NRHP Listing

The SRNCHP (DT 66) was listed in the NRHP in 1996, with the nomination updated in 2010 (Erigero 1990; Johnson 2010). As of 2010, the SRNCHP (DT 66) is listed in the NRHP as significant at the national level under Criteria A, B, and C and has a period of significance of 1917–1961, beginning in the year the SRHP was first conceptualized by City Light and ending with the completion of the Gorge High Dam. The district is listed under Criterion A, in the area of Politics and Government, because it represents almost 50 years of American utility politics and development from the Progressive Era through the decades following World War II. The projects' development ensured the existence of City Light as a municipal utility and was immensely influential on the public power movement over the course of the 20th century. The district is listed under Criterion B, in the areas of Politics and Government, Entertainment/Recreation, and Landscape Architecture, for its association with J.D. Ross, City Light Superintendent for 28 years, and Ross's vision for City Light and public power, in particular hydroelectric power. Ross was instrumental in the projects' development, but also used the projects as a showcase to promote hydroelectric power and municipal utility ownership. The district is also listed under Criterion C, in the areas of Community Planning and Development, Engineering, Architecture, and Transportation for its representation of a general trend of developing more costly and remote hydroelectric sites in the 1920s and for its new and inventive engineering practices, both in the technical construction of the facilities themselves, as well as in the development of municipally owned towns (Newhalem and Diablo, Washington) and the transportation infrastructure required for their construction (Johnson 2010:8-1–8-2).

The historic district is three miles long and extends in a discontiguous linear manner along the north and south banks of, over and across the Skagit River within the Ross Lake National Recreation Area (RLNRA). Starting in Newhalem and extending east to Ross Dam, it includes the sequence of towns and industrial resources related to the SRNCHP (DT 66) and is grouped into seven discrete historic areas: Historic Area A – Town of Newhalem; Historic Area B – Gorge Powerhouse and Dam Complex; Historic Area C – Diablo Powerhouse Complex; Historic Area D Discontiguous Resources – Diablo Lake; Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site; Historic Area E – Ross Powerhouse and Dam Complex; and Historic Area F – Hollywood Residential Area. The lakes formed by the dams are not included in the district. (Johnson 2010:7-2).

Property Development

The transmission line is located along the Skagit River across and within the town of Newhalem in Whatcom County, Washington. It is located within Sections 21 and 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA, a subunit of the National Parks Service (NPS) North Cascades National Park Service Complex. The The transmission line was constructed in 1965 based on a design by City Light; however, available documentation does not specify the engineer or contractor responsible for its construction (City Light 1965c).

As originally constructed, the alignment of the transmission line ran north underground from the powerhouse to a point north of the building where the line emerged and ran aboveground supported by a single log pole and a pair of log poles on the southern bank of the Skagit River. It then crossed the Skagit River aboveground between this first pair of poles and a second pair on the north side of the river. On the north side of the Skagit River, the line was again undergrounded and ran on a generally eastern alignment along the northern bank of the Skagit River to the south of the residences along Silk Stocking Road. It turned slightly north as it neared the Skagit/Newhalem – Trail of the Cedars Suspension Bridge (WISAARD Property ID 103521) to a point south of the intersection of Silk Stocking Road/Ladder Creek Lane and Main Street in Newhalem. The line's alignment again turned east and ran straight along the south side of Ladder Creek Lane to a point south of the City Light water tower. From here the line followed the curve of the Ladder Creek Lane right-of-way to the Skagit/Newhalem/Gorge - Suspension Bridge (WISAARD Property ID 103436). As it reached the bridge, the line emerged from underground and crossed the Skagit River within a conduit affixed to the south side of the bridge. On the east side of river, the line was again undergrounded and ran east to the Gorge Powerhouse. (City Light 1965a, 1965b, 1965c, 1969b)

The original aboveground components of the transmission line consisted of a pair of wood poles on each side of the Skagit River. located to the north of the powerhouse on the southern bank of the Skagit River and on the northern bank in Newhalem, a single pole closer to the powerhouse but still north of the building, and the Gorge Suspension Bridge conduit. The pairs of log poles shared similar design, consisting of two poles, spaced 10 feet apart, with their own pairs of anchor cables, and connected at the top by cross supports. The southern bank pair had four cross supports, while the northern bank pair had two. The line ran up each pole within a metal conduit, with associated distribution equipment (e.g., smaller transformers typically seen in residential areas) was attached to the poles or cross supports. The design of the single pole was similar, consisting of a log pole with an anchor cable, a metal conduit, and associated distribution equipment. The Suspension Bridge conduit consisted of two sections of flex conduit with a centrally placed connector. (City Light 1965a, 1965b, City Light 1965c, City Light 1969b)

An additional section of the aboveground line was installed over the Gorge Suspension Bridge in 1969. The line made use of the existing Suspension Bridge support structures to support the trio of aboveground cables, which corresponded to the Newhalem-Gorge Powerhouse Line (likely associated with the NCHP full automation and remote operation from the Gorge Powerhouse), camp feeder, and telephone cable (City Light 1969a).

Photographs of the powerhouse and its vicinity in 1987 and 1990 show no evidence of an aboveground distribution line from the powerhouse. An access vault appears to be partially visible in the 1987 photograph, located to the west of the powerhouse in the vicinity of extant aboveground transmission equipment units, potentially indicating the presence of underground transmission infrastructure located in this area at that time (NPS 1987). This area west of the powerhouse was not documented in 1990, but again no aboveground distribution lines were visibly connected to the powerhouse at that time (Erigero 1990: Photo 62).

In 2000, City Light produced an engineering plan of the transmission line, identified as Newhalem Generator 20. At that time, the line ran underground from the powerhouse to the extant aboveground transmission equipment boxes, and then north in two lines to the vicinity of single pole on the southern bank of the Skagit River. The line crossed the Skagit River aboveground to a second pole on the river's northern bank. On the north

side of the river, the line was again undergrounded and ran northeast under Cherry Blossom Lane to a point just northeast of the extant City Light Administration Building in Newhalem. From this point the line turned east, passing below Cherry Blossom Lane before turning northeast and running along the river to the south of the residential structures built along South Stocking Road. The line turned northwest and ran between the two easternmost of these residences and below Silk Stocking Road to a point on the north side of the road's right-of-way. From this point it turned northeast again, running along the right-of-way of Silk Stocking Road/Ladder Creek Lane. The line turned slightly east as it neared the extant building at 665 Ladder Creek Lane and crossed Ladder Creek Lane to the northern bank of the Skagit River. The line then immediately crossed back under Ladder Creek Lane and ran northeast within the current City Light compound at this location before again crossing east under Ladder Creek Lane. The line then ran along the curved right-of-way of Ladder Creek Lane to the Gorge Pedestrian Suspension Bridge and crossed the Skagit River within an aboveground conduit affixed to the south side of the bridge. On the eastern bank of the river, the line was again undergrounded and continued north-northeast and before turning west to enter the east side of the Gorge Powerhouse. Based on this documentation, it appears that the transmission line's original underground alignment through Nehalem was changed in 2000, with the current underground alignment replacing portions of the 1965 alignment in this area. (City Light 2000).

The Suspension Bridge conduit was photographed in 2010 as part of the revised NRHP documentation for the SRNCHP (DT 66). At that time, the conduit consisted of a single continuous pipe that ran the length of the bridge along its southern side. An additional larger conduit ran along the north side of the bridge at this time, though it is unknown if this second conduit was related to the transmission line or other transmission infrastructure in the area. (Johnson 2010: File #0392).

As most of the transmission line is located underground, only its aboveground components were documented as part of this study, including the aboveground transformer units to the west of the powerhouse, the support poles on the southern and northern banks of the Skagit River, the Suspension Bridge conduit, and vault access points throughout Newhalem. The transmission line's aboveground support on each side of the river now consists of a trio of log poles spaced evenly apart and supported by anchor cables to prevent the poles. Several individual poles have metal conduits affixed to them, and associated distribution equipment attached to the poles or cross supports. Between the poles, the line runs across the river in three sets of four wires, spaced vertically. The Suspension Bridge conduit now consists of a set of three metal pipes running along the south side of the bridge. The additional conduit on the north side of the bridge remains extant, though its function and potential relationship with the transmission line is unknown. Vault access points throughout Newhalem are generally similar in design, consisting of steel access hatches set flush into concrete pads, though the size and number of the access hatches and pads varies slightly among access points along the lines' alignment. Some pads contain multiple hatches, while other pads contain just a single hatch. Based on the location of the vault access points throughout Newhalem, it appears that the line's underground alignment within Nehalem has not changed since 2000.

National Register of Historic Places Eligibility Evaluation

Significance Analysis

National Register of Historic Places Criterion A

The transmission line is significant under Criterion A for its association with planned improvements to the NCPDC's electric power distribution network in the 1960s as part of City Light's continued operation of the facility for local power production for Newhalem and as station service power backup plant for the Gorge Powerhouse (Johnson 2010:46). This project followed two decades of expansion and redevelopment in the town of Newhalem and was likely pursued to improve the town's local electrical distribution network (Johnson 2010:8-16–8-19). Due to the fire in 1966, it was necessary to reconstruct the powerhouse to continue operation of the NCHP; the headworks was redeveloped during this period as well (Johnson 2010:8-5). The transmission line was constructed in 1965 prior to the fire and, thus, was a planned improvement rather than part of the redevelopment project necessitated by the damage to the facility's components. The reconstructed powerhouse began producing power again in 1970 and with the rest of the components of the NCHP continued power generation until 2010 (Johnson 2010:8-5). Though the transmission line has significant historic associations, its underground alignment has changed, and alterations have been made to its aboveground components (see Integrity Analysis for a more robust description). As such, the transmission line lacks integrity to convey this significance and is not considered significant under Criterion A, individually or as a contributor to the NCPDC historic area and the SRNCHP (DT 66).

National Register of Historic Places Criterion B

The transmission line is not associated with any individuals that played a significant role in national, regional, or local history. At the time of the transmission line's construction, City Light was led by John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines in the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. Furthermore, research provided no indication that any other individuals potentially associated with the property played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2020). As such, the transmission line is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

National Register of Historic Places Criterion C

The transmission line was designed by City Light; however, available documentation does not specify the engineer or contractor responsible for its construction. The line is representative of common design and construction methods for electric transmission infrastructure in the latter half of the 20th century (Allen et al. 2020:4-9). Most of the line is underground, constructed using underground trenching in which the line is buried. Aboveground, the line is either common overhead line supported by wood poles or in the conduit along the Suspension Bridge. The design and method of construction of the line's individual components did not necessitate innovative engineering or employ new or uncommon materials. Furthermore, the transmission line does not retain its original

underground alignment through Newhalem, a key component of its design, and alterations to its aboveground components have undermined the integrity of the line overall. Given the transmission line represents a common engineering type and lacks integrity, the property is not considered significant under Criterion C. Thus, the transmission line is not eligible individually or as a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C.

National Register of Historic Places Criterion D

The transmission line is a common example of its engineering type that provides no important information about the general trends in the design and construction of electric transmission infrastructure that occurred in Washington during the latter half of the 20th century that cannot be obtained through documentary sources. Therefore, the transmission line has not yielded and is not likely to yield information important in prehistory or history. For this reason, the transmission line cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Integrity Analysis

Integrity is defined as the ability of a property to convey historic significance through its character-defining physical features, as expressed through integrity of location, setting, design, materials, workmanship, feeling, and association.

The transmission line does not retain integrity of location. While individual features such as the Skagit River crossing poles may be in their original locations, the line's 1965 underground alignment in Newhalem was substantially altered in 2000, though portions of its alignment south and east of the Skagit River and along the curved section of Ladder Creek Lane appear to remain intact. The transmission line retains its integrity of setting as its aboveground components, from the powerhouse to the south side of Newhalem and across the Suspension Bridge, remains largely unchanged since the line's construction in 1965. The property does not retain integrity of design. The transmission line's alignment—a key component of its design—has been changed, which suggests further alteration to its materials as the replacement alignment likely include construction of new underground line throughout Newhalem. Furthermore, its documented aboveground components have been undermined through alterations since its construction, including the replacement of the original pairs of log poles on each side of the Skagit River, first with single poles and then later with trios of poles, and the expansion of the Suspension Bridge conduit from a single pipe to a set of three pipes. The transmission line retains integrity of materials and workmanship. While replacement of both aboveground and belowground components has occurred, the materials of replacement features have likely been in-kind with the 1965 line. Likewise, the construction methods for the construction of underground and aboveground transmission lines have been consistent for much of the 20th century, including the installation of aboveground poles and lines, and in the latter half of the 20th century, the trenching and burial of underground conduit. Once constructed, transmission lines have few signifiers of the workmanship or equipment involved in their construction. The transmission Line retains integrity of feeling because its visible aboveground components are representative of transmission line infrastructure and contribute to Newhalem's broader feeling as a hub of hydroelectric power generation. It also retains integrity of association, remaining within the town of Newhalem and connecting the NCHP to the SRHP's Gorge Powerhouse. Despite its alterations, the transmission line remained an

active component of the NCHP until 2010, transmitting generated power from the NCHP to the Gorge Powerhouse. The overhead Skagit River crossing has also served as a key visible connection between the NCPDC and the town of Newhalem.

Overall, the transmission line does not meet the majority of the seven aspects of integrity. While it retains integrity in setting, materials, workmanship, feeling and association, alterations to the property have undermined its integrity of location and design to such a degree that the transmission line does not retain sufficient overall integrity to convey its potential significance under Criteria A as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendation

Eligibility as a District Contributor

The transmission line is within the boundaries of the SRNCHP (DT 66) historic district, which was listed in the NRHP in 1996 (and updated in 2010) under Criteria A, B, and C with a period of significance of 1917–1961. The transmission line was not previously identified as a component to the Newhalem Creek Powerhouse Site, which was listed in the NRHP as a contributing resource to SRNCHP (DT 66) in the district's Historic Area D, Single Non-Contiguous Resources (Erigero 1990:7-4; Johnson 2010:7-82).

This study reconsiders the Newhalem Powerhouse Site as a new historic area within the SRNCHP (DT 66) district, the Newhalem Creek Powerhouse and Dam Complex (NCPDC, with an expanded period of significance of 1918–1970, beginning with the planning and construction of the NCHP and ending with the year the reconstructed NCHP began producing power. The transmission line is not recommended as a contributor to SRNCHP (DT 66) in the newly recommended historic area.

The transmission line is not recommended as a contributor to the SRNCHP (DT 66) under Criteria A, B, or C. While the transmission line has significant historical associations with NCHP following its 1967–1970 redevelopment, the transmission line does not retain integrity to convey significance under Criterion A. The transmission line does not share the district's association with Ross and represents a common form of its engineering type and lacks integrity to convey engineering significance as a component of the NCPDC. Therefore, the transmission line is not recommended as a contributing resource to the SRNCHP (DT 66) under Criteria B or C.

Individual NRHP Eligibility

The transmission line has significant associations under Criterion A as discussed previously. However, the transmission line does not retain integrity to convey individual significance under Criterion A. Without meaningful connection to an individual important to history, lacking individual engineering significance and having lost integrity in location, design, materials, and workmanship, and lacking the ability to yield information important to prehistory or history, the transmission line cannot be considered to have individual significance under Criteria B, C, or D. Thus, in the absence of individual significance, regardless of physical condition, the transmission line cannot be considered to have integrity that conveys individual significance under Criteria B, C, or D. As such, the transmission line is recommended not eligible for individual listing in the NRHP under Criteria A, B, C, or D.

Physical description:

The current alignment of the transmission lines runs north from the powerhouse, crosses the Skagit River, proceeds circuitously but generally easterly through Newhalem, and then crosses the Skagit River again to terminate at the Gorge Powerhouse. The 4,387-foot-long transmission line is predominantly underground, including 350 feet of buried cable from the powerhouse to the Skagit River crossing and 3,000 feet through the town of Newhalem (City Light 2022a:A-4). The remaining 1,037 feet of cable is aboveground, including the first 400-foot overhead Skagit River crossing, and the second 637-foot Skagit River crossing from the town of Newhalem to the Gorge Powerhouse (City Light 2022a:A-4). Other aboveground components consist of three ground concrete pad mounted transformers to the immediate west of powerhouse, wood power poles, the conduit on the Gorge Suspension Bridge, and access vaults throughout Newhalem.

The transmission line's supports on each side of the Skagit River north of the powerhouse consist of three tall (40 or 50 feet) wood poles spaced evenly apart with each anchored by utility guy wires. Several individual poles have metal conduits affixed to them, and associated distribution equipment (e.g., smaller transformers typically seen in residential areas) attached to the poles. Between the trios of poles, lines run across the river in three sets of four vertically spaced wires. At the Gorge Suspension Bridge, the transmission line is within conduit consisting of a set conduit runs surface mounted at the bottom of the south side of the bridge. The transmission line's access vaults throughout Newhalem are all similar in design—steel access hatches set flush at ground level into concrete pads, which open into underground concrete vaults or boxes. The size and number of the access hatches and pads do vary at different access points along the transmission lines' alignment. Some pads contain multiple hatches, while other pads contain just a single hatch. The transmission line's aboveground components are in good condition. Its underground components could not be documented; therefore, the condition of these components is unknown.

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Historic Property Report

Historic Name: Newhalem Creek Bridge

Property ID: 729316

Location

Address: Newhalem, Washington

Geographic Areas: Whatcom County, T37R12E28

Information

Number of stories: N/A

Construction Dates:

Construction Type	Year	Circa
Built Date	1969	☐

Historic Use:

Category	Subcategory
Transportation	Transportation - Road-Related (vehicular)
Transportation	Transportation - Road-Related (vehicular)

Historic Context:

Category

Architect/Engineer:

Category	Name or Company

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

Historic Property Report

Historic Name: Newhalem Creek Bridge Property ID: 729316

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2021-08-05085, , Newhalem Creek Hydroelectric Project Decommissioning		Survey/Inventory	

Photos

Newhalem Creek Bridge, facing northeast.

Newhalem Creek Bridge in 1970, facing northwest.

Newhalem Creek Bridge, showing metal grate deck and steel plate ADA deck alteration, facing west.

Underside of Newhalem Creek Bridge showing diagonal girder supports and east concrete abutment, facing east.

Historic Property Report

Historic Name: Newhalem Creek Bridge Property ID: 729316

Inventory Details - 9/26/2022

Common name:

Date recorded: 9/26/2022

Field Recorder: Corey Lentz; Will Linder; January Tavel

Field Site number:

SHPO Determination

Detail Information

Characteristics:

Category	Item
Foundation	Concrete - Poured
Form Type	Bridge - Steel Girder
Structural System	Metal - Steel
Plan	Rectangle

Surveyor Opinion

Property is located in a potential historic district (National and/or local): Yes

Property potentially contributes to a historic district (National and/or local): Yes

Significance narrative: This inventory recommends the Newhalem Creek Bridge, located near the town of Newhalem in Whatcom County, Washington, not eligible for individual listing in the NRHP under Criteria A, B, C, or D. However, the property is recommended eligible as a contributor to the Skagit River and Newhalem Creek Hydroelectric Projects (SRNCHP) DT 66 under Criteria A and C. Supporting analysis is provided in the historic context, eligibility evaluation (significance analysis, integrity analysis, and eligibility recommendation statement), and physical description herein.

Historic Context

Prior to the development of the City of Seattle, City Light Department's (City Light) Skagit River Hydroelectric Project (SRHP), the upper Skagit River was a remote and rugged area in Whatcom County where Native American groups had lived for millennia. What eventually became the town of Newhalem was part of an extended Upper Skagit village system called k'wabacábš. Oral history and archaeological evidence indicate that the area around the powerhouse was important for hunting, gathering, and fishing (Mierendorf 1996). Euro-American miners began travelling upriver in the 1880s in search of gold, constructing rudimentary cabins at their claim sites. By the 1890s, a few homesteaders had settled along upper Skagit River in the vicinity of the future site of Newhalem to provision miners with supplies, but by the time City Light sought to develop the area as a potential site of hydroelectric power in the 1910s, the upper Skagit River remained remote and sparsely populated by Euro-Americans. (Johnson 2010:8-2–8-4).

As part of the planning process for SRHP, City Light determined it needed a small temporary hydroelectric facility sited near the work camp and construction site. This facility, the Newhalem Creek Hydroelectric Project (NCHP), was constructed on

Newhalem Creek, a tributary off the south side of the Skagit River southwest of present day Newhalem. The construction of the NCHP was a perquisite for the construction of first SRHP facility, the Gorge Powerhouse and Dam Complex (GPDC), as the plant would provide power to the construction camp that would serve as headquarters of the SRHP and would later become the town of Newhalem. The site of the Newhalem Creek Powerhouse and Dam Complex (NCPDC) was surveyed and selected for the proposed temporary facility in the summer of 1918. (Johnson 2010:8-5).

Construction materials were transported from City Camp (now the Town of Newhalem) to the powerhouse Construction materials were transported from City Camp (present-day Town of Newhalem) to the powerhouse site using construction methods common to logging during the early 20th century. City Light constructed a cableway skidding system (also referred to as an overhead system) feeder from the railway on the north bank of the river to the powerhouse site, with which was a cableway skidding system (also referred to as an overhead system) used to move materials across the river just to the west of the suspension bridge (City Light 1919f, 1920a; Bryant 1923:504). This overhead system consisted of a set of two poles connected by a cross bar (referred to as a head spar tree) on each bank of the river, with the northern head spar tree additionally supported by a central strut (City Light 1920a; Bryant 1923:504). A cable ran between each head spar tree, with winches on either side to facilitate the movement of the traveler (the device that held materials) along the cable (City Light 1920a). This system remained in place just north of the suspension bridge through at least 1937 but was removed by the early 1950s (Figure 5) (City Light 1937 n.d.a.). After materials crossed the river, they were transported west to the powerhouse along the skid road. A skidder—a device powered by steam or electricity that operates on or near a railroad track, which moves materials by means of a cable—was installed on the hill to the east and behind the powerhouse to transport construction materials uphill from the powerhouse site to build the penstock (City Light 1920f; Bryant 1923:504).

The headworks site was accessed by a pedestrian trail, known as the Gatehouse Trail, which ascended the adjacent hillside on southwestern alignment from the powerhouse toward Newhalem Creek, and then proceeded west and south above and to the east of Newhalem creek (City Light 1920e). The alignment of the Gatehouse Trail was depicted in City Light's April of 1920 Drawing No. B-55 and again in the NCHP's 1969 FERC license application, though the trail was not explicitly identified in the latter (City Light 1920g). Construction materials for the 1921 headworks' timber crib dam and intake/gatehouse structure were sourced directly from the headworks site and surrounding area (City of Seattle 1969:Exhibit Q-1).

The NCPDC was completed in 1921, with power first produced in August of that year (Johnson 2010:7-44, 8-5). The 1921 NCPDC included a headworks on Newhalem Creek approximately one mile upstream from its confluence with the Skagit River, power tunnel, penstock, powerhouse, tailrace, and transmission line. The 1921 headworks' low log crib diversion dam that directed water into a vertical timber intake structure east of the dam connected to the power tunnel by a 55-foot-tall, 5-foot by 5-foot vertical rock shaft (City Light 1921a, 1921b, 2022:1-1; Johnson 2010:8-5). From the intake, water flowed north–northwest underground through the 2,452 feet long bored power tunnel (Johnson 2010:8-5; City Light 2022:1-1). Below ground, the power tunnel funneled water via a pipe intake bell surrounded by a concrete plug into the 925-foot penstock, of which 218 feet were located within the rock tunnel and the remaining 707 feet ran downhill to the powerhouse after daylighting from the rock tunnel (City Light 1919b; 2022:1-1; Johnson 2010:8-5). Along its descending alignment, the penstock was supported by U-

shaped timber saddles, placed at regular short intervals between six thrust blocks (City Light 1920c). The penstock split as it entered the powerhouse to service each of the plant's Pelton Water Wheel Company (PWWC) double-nozzle impulse-type waterwheels, which powered a 2,000- kilovolt amperes (kVA) Westinghouse generator (City Light 1920c; Johnson 2010:8-5; Engineering World 1920:314). Water was discharged from the powerhouse into the tailrace, which ran north to the Skagit River (Roberts 1924:952; Johnson 2010:8-5). The original 1921 NCPDC powerhouse was a rustic wood framed building with board-and-batten siding, a corrugated metal roof, and a series of wood-sashed windows along its north façade (City Light 1919a). A 6600-volt aboveground transmission line transmitted power from the powerhouse, which ran northwest over the Skagit River to the rail line in Newhalem, and then northeast to the GPDC construction site (City Light 1921c).

The NCHP provided power to the buildings of the City Camp (later Newhalem), as well as the construction of both the Gorge power tunnel and powerhouse. These competing demands on the facility's limited capacity led to power shortages and delays in the construction of the GPDC (Johnson 2010:8-6). City Light initially intended the NCHP to be a temporary facility to facilitate the construction of the City Camp and the GPDC (Johnson 2010:8-5). However, the facility remained in operation following the completion of the GPDC in 1924, with its output then routed into the larger Skagit transmission and distribution network. In this new role as a local production and support facility, the NCHP provided power for the town of Newhalem and station service power for the Gorge Powerhouse's electrically operated equipment (e.g., heating, lighting and cooling). The NCHP was semi-automated in the early 1950s, allowing it to operate largely unmanned, with manual start-up and shut-down still required (Johnson 2010:8-5). City Light redeveloped the transmission line from the powerhouse to the Gorge Powerhouse in 1965, undergrounding most of the line within the town of Newhalem and rerouting it along the north bank of the Skagit River (City Light 1965a, 1965b).

A fire in July 1966 severely damaged the powerhouse. It burned down the building, but a flange gasket in one line of the bifurcated penstock behind the powerhouse blew out, creating a 60- to 70-foot-high sheet of water behind the powerhouse preventing fire damage in the surrounding wooded area. Additionally, the equipment within the powerhouse continued to run, saving the original PWWC turbines and Westinghouse generator from warping from the heat of the fire. (Johnson 2010:8-5). After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. In 1968 City Light replaced a log stringer bridge over Newhalem Creek on Powerhouse Road with the current Newhalem Creek Bridge to access the powerhouse from the west (City Light 1968; City of Seattle 1969:Exhibit N).

The current powerhouse was constructed between 1967 and 1969 (Johnson 2010:7-44). The only major repair on the generating equipment was the rewinding of the Westinghouse generator and minor welding repair to the two PWWC turbines (Johnson 2010:8-5). The existing headworks on Newhalem Creek was also rebuilt during this period. The 1969 headworks consisted of a curved diversion dam and apron, rectangular sluice way/channel, intake and rock shaft, gatehouse, and associated concrete slabs around the gatehouse; the 1969 headworks retained the existing log footbridge that crossed from the western bank access road to the gatehouse on the eastern bank (City Light 1969a, 1969b). The redeveloped NCHP retained and continued to utilize the original power tunnel, penstock, and tailrace, which required only minor maintenance and repairs following the fire. Before going back online in 1970, the NCHP was fully

automated, the first of the Skagit River facilities to undergo the process, and remote control of the newly operational powerhouse equipment was established at the Gorge Powerhouse. (Johnson 2010:7-44, 8-5, 8-46; City Light 1971:11).

The NCHP was relicensed in 1997 and continued to operate until 2010 (City Light 1992, 2022c:A-5). The NCHP has not been consistently in service since 2010 due to an automatic gate valve requiring repairs. While equipment and structural issues resulting in the 2010 shutdown were eventually addressed, subsequent issues necessitated the current decommissioning of the NCHP. In 2015, a wildfire burned many of the original wooden penstock saddles, requiring an extensive replacement project in 2016-2017. More recently, leaks in the power tunnel, maintenance needs at the headworks and powerhouse, and access road safety concerns prohibit the continued operation of the NCHP. In 2021, City Light began the process of surrendering the facility's license (City Light 2022c:vi).

Skagit River and Newhalem Creek Hydroelectric Projects NRHP Listing

The SRNCHP (DT 66) was listed in the NRHP in 1996, with the nomination updated in 2010 (Erigero 1990; Johnson 2010). As of 2010, the SRNCHP (DT 66) is listed in the NRHP as significant at the national level under Criteria A, B, and C and has a period of significance of 1917–1961, beginning in the year the SRHP was first conceptualized by City Light and ending with the completion of the Gorge High Dam. The district is listed under Criterion A, in the area of Politics and Government, because it represents almost 50 years of American utility politics and development from the Progressive Era through the decades following World War II. The projects' development ensured the existence of City Light as a municipal utility and was immensely influential on the public power movement over the course of the 20th century. The district is listed under Criterion B, in the areas of Politics and Government, Entertainment/Recreation, and Landscape Architecture, for its association with J.D. Ross, City Light Superintendent for 28 years, and Ross's vision for City Light and public power, in particular hydroelectric power. Ross was instrumental in the projects' development, but also used the projects as a showcase to promote hydroelectric power and municipal utility ownership. The district is also listed under Criterion C, in the areas of Community Planning and Development, Engineering, Architecture, and Transportation for its representation of a general trend of developing more costly and remote hydroelectric sites in the 1920s and for its new and inventive engineering practices, both in the technical construction of the facilities themselves, as well as in the development of municipally owned towns (Newhalem and Diablo, Washington) and the transportation infrastructure required for their construction (Johnson 2010:8-1–8-2).

The historic district is three miles long and extends in a discontiguous linear manner along the north and south banks of, over and across the Skagit River within the Ross Lake National Recreation Area (RLNRA). Starting in Newhalem and extending east to Ross Dam, it includes the sequence of towns and industrial resources related to the SRNCHP (DT 66) and is grouped into seven discrete historic areas: Historic Area A – Town of Newhalem; Historic Area B – Gorge Powerhouse and Dam Complex; Historic Area C – Diablo Powerhouse Complex; Historic Area D Discontiguous Resources – Diablo Lake; Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site; Historic Area E – Ross Powerhouse and Dam Complex; and Historic Area F – Hollywood Residential Area. The lakes formed by the dams are not included in the district. (Johnson 2010:7-2).

Property Development

The Newhalem Creek Bridge on Powerhouse Road is on the south side of the Skagit River west of the Town of Newhalem in Whatcom County, Washington. It is in Section 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA, a subunit of the National Park Service (NPS) North Cascades National Park Service Complex. The Newhalem Creek Bridge was constructed in 1968 by City Light based on a design by City Light; however, available documentation does not specify the engineer or contractor responsible for its construction (City Light 1968a).

The Newhalem Creek Bridge on Powerhouse Road spanning Newhalem Creek was constructed prior to reconstruction of NCPDC powerhouse occurring at that time to allow vehicular access to the powerhouse site and facilitate the transportation of equipment and construction materials. The Newhalem Creek Bridge replaced an existing log stringer bridge, likely constructed by USFS, that had been washed out by high water City of Seattle 1969:Exhibit N). As originally constructed, the Newhalem Creek Bridge was a single span approximately 85 feet long. Parallel horizontal I-beams ran the length of the span between the bridge's concrete abutments, with the metal grate deck supported by perpendicular I-beam girders placed at short regular intervals and reinforced further by slim diagonal supports below. A horizontal thrie-beam standard highway guardrail lined either side of the bridge, supported by steel I-beam rail posts spaced at regular intervals down each side of the bridge (City Light 1968).

The only documented alteration to the Newhalem Creek Bridge is a modification to make it wheelchair accessible for its use as footbridge associated with the Linking Trail, a stipulation included in City Light's 1998 Historic Resources Mitigation and Management Plan related to the facilities relicensing application in 1997 (City Light 2022a:E-40). This alteration was observed during the current survey, consisting of a narrow steel panel extending across the northern edge of the bridge on top of its metal grate deck. Additionally, the thrie-beam guardrails of the Newhalem Creek Bridge have been substantially dented near their western end, likely from a tree falling across the bridge.

National Register of Historic Places Eligibility Evaluation

Significance Analysis

National Register of Historic Places Criterion A

The Newhalem Creek Bridge is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its association with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the NCHP for local power production for the town of Newhalem and as station service power backup for the Gorge Powerhouse (Johnson 2010:46). Due to a fire in 1966, it was necessary to reconstruct the powerhouse to continue operation of the NCHP; the headworks was redeveloped during this period as well (Johnson 2010:8-5). Newhalem Creek Bridge was constructed during this redevelopment phase to facilitate vehicular access to the 1969 powerhouse construction site.

Given its significant historic associations with the redevelopment of the NCHP in 1967–1970, which allowed for continued operations of the NCHP and the SRHP, the Newhalem Creek Bridge is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66). However, it is not considered to be individually significant

under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and SRNCHP (DT 66).

National Register of Historic Places Criterion B

The Newhalem Creek Bridge is not associated with any individuals that played a significant role in national, regional, or local history within the NCHP or the SRHP. At the time of the powerhouse's construction, City Light was led by Superintendent John M. Nelson. While Nelson may be a significant individual in regional history for his leadership of City Light from 1963–1971, Nelson's most significant work as the agency's superintendent was the execution of a 1959 plan to underground much of the agency's transmission lines within the City of Seattle, the construction of the Boundary Dam on the Pend Oreille River in Pend Oreille County, Washington, and the exploration of nuclear power as additional power source for City Light (Wilma 2001). The redevelopment of the NCHP was not a major project of Nelson's tenure, and research provided no indication that Nelson was involved substantially in the project in a manner similar to J.D. Ross's development of hydroelectric power on the Skagit River. Furthermore, research provided no indication that any other individuals potentially associated with the property played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2020). As such, the Newhalem Creek Bridge is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

National Register of Historic Places Criterion C

The Newhalem Creek Bridge was designed by City Light; however, available documentation does not specify the engineer or contractor responsible for its construction. The bridge is a single-span steel bridge typical of small bridge construction during this period. However, the bridge design and materials remain entirely intact, with its only alteration introducing the wheelchair walkway to the bridge's deck. Furthermore, it is also one of two extant beam bridges constructed by City Light near the SRNCHP (DT 66), the other being the Windy Gap Railroad Bridge (b. 1937) (Johnson 2010:7-42). All other bridges identified within the historic district are either suspension bridges or truss bridges constructed prior to 1952, except for of the Trail of the Cedars Suspension Bridge, built c. 1975. (Johnson 2010:7-26, 7-29, 7-32, 7-80). As the only post-World War II beam bridge extant within the SRNCHP (DT 66), the Newhalem Creek Bridge is a unique example of City Light's small-scale bridge construction in this period. The Newhalem Creek Bridge is thus found to be a district contributor in engineering to the NCPDC and the SRNCHP (DT 66) under Criterion C. However, the Newhalem Creek Bridge is not considered to be individually significant in engineering under Criterion C because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and the SRNCHP (DT 66).

National Register of Historic Places Criterion D

The Newhalem Creek Bridge is a common example of its engineering type that provides no important information about the general trends of bridge construction or design that occurred in Washington during the late 1960s that cannot be obtained through documentary sources. Therefore, the Newhalem Creek Bridge has not yielded and is not likely to yield information important in prehistory or history. For this reason, the Newhalem Creek Bridge cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Integrity Analysis

Integrity is defined as the ability of a property to convey historic significance through its character-defining physical features, as expressed through integrity of location, setting, design, materials, workmanship, feeling, and association.

The Newhalem Creek Bridge retains integrity in location and setting. The structure has remained in its original location since it was built in 1968. The bridge's heavily forested setting the south side of the Skagit River has been largely consistent since its construction, though the construction of the RLNRA Newhalem Creek Campground and NCVC and NPS development of recreational trails such as the Linking Trail and Rock Shelter Trail in its vicinity has minimally diminished its remote surrounding. The Newhalem Creek Bridge retains integrity in design, materials and workmanship. The bridge's only alteration is the added steel panel extending across the northern edge of the bridge on top of its metal grate deck. However, this alteration only obscures a narrow portion of the metal great deck and otherwise the Newhalem Creek Bridge is fully intact. Additionally, it retains all of its original metal and concrete materials, and this alteration is consistent with those materials. The bridge still reflects its method of construction, a short single-span consisting of concrete abutments and metal beams and girders, were common for post-war bridges over minor waterways. The Newhalem Creek Bridge retains integrity of feeling. The bridge has only been minimally altered and changes to its immediate vicinity have been limited, such that the experience of the bridge and its isolated location on Newhalem Creek remain the same as its period of construction. The Newhalem Creek Bridge also retains integrity of associations, remaining tied to its historic location on Powerhouse Road at Newhalem Creek and has facilitated vehicular access to the powerhouse since its construction.

Overall, the Newhalem Creek Bridge retains all integrity in all seven aspects. Thus, it retains overall integrity to convey its significance under Criteria A and C as a contributor to the SRNCHP (DT 66).

Eligibility Recommendation

Eligibility as a District Contributor

The Newhalem Creek Bridge is located outside the boundaries of a NRHP-listed historic district, the SRNCHP (DT 66), which was listed in the NRHP in 1996 (and updated in 2010) under Criteria A, B, and C with a period of significance of 1917–1961. The Newhalem Creek Bridge was not previously identified as a component of the Newhalem Creek Powerhouse Site, which was listed in the NRHP as a contributing resource to the SRNCHP (DT 66) in the district's Historic Area D, Single Non-Contiguous Resources. (Erigero 1990:7 -4; Johnson 2010:7-82).

This study reconsiders the Newhalem Powerhouse Site as a new historic area within the SRNCHP (DT 66) historic district, the Newhalem Creek Powerhouse and Dam Complex, with an expanded period of significance of 1918–1970, beginning with the planning and construction of the NCHP and ending with the year the reconstructed redeveloped NCHP began producing power. The Newhalem Creek Bridge is recommended eligible for listing in the NRHP as a contributor to the SRNCHP (DT 66) under Criteria A and C, in the newly recommended historic area.

The Newhalem Creek Bridge is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the redevelopment of the NCHP from 1967–1970, which ensured the continued operation of the facility for local power production for the town of Newhalem and as a support facility for the Gorge Powerhouse. The construction of the Newhalem Creek Bridge facilitated vehicular access to the 1969 powerhouse construction site, supporting the reconstruction of the powerhouse. The Newhalem Creek Bridge retains integrity to convey this significance under Criterion A during the 1968–1970 period, the date of the property's completion to the year the redeveloped NCHP began producing power.

The Newhalem Creek Bridge is not recommended as a contributor to the SRNCHP (DT 66) under Criterion B. The district is listed in the NRHP under Criterion B for its significant association with J.D. Ross, the head of City Light from 1911–1939 who was involved substantially in the planning and construction of the SRHP and NCHP. As the bridge was constructed well after 1939, the property does not share this association with Ross.

The Newhalem Creek Bridge is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion C as intact and unique example of small-scale bridge construction by City in the post-World War II period. The Newhalem Creek Bridge retains integrity to convey its engineering significance under Criterion C in 1968, the date of its construction.

Individual NRHP Eligibility

The Newhalem Creek Bridge is significant under Criterion A and retains integrity to convey this significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and cannot be represented by the Newhalem Creek Bridge alone. Thus, in the absence of individual significance, regardless of physical condition, the Newhalem Creek Bridge cannot be considered to have integrity that conveys individual significance under Criterion A. As such, the Newhalem Creek Bridge is recommended not eligible for individual listing in the NRHP under Criterion A.

The Newhalem Creek Bridge is significant under Criterion C and retains integrity to convey this significance, as discussed previously. However, the significance of its engineering is derived from its context within the NCPDC and SRNCHP (DT 66) that cannot be represented solely by the Newhalem Creek Bridge. Thus, in the absence of individual significance, regardless of physical condition, the Newhalem Creek Bridge cannot be considered to have integrity that conveys individual significance under Criterion C. As such, the Newhalem Creek Bridge is recommended not eligible for individual listing in the NRHP under Criterion C.

Without meaningful connection to an individual important to history, and unable to yield information important to prehistory or history, the Newhalem Creek Bridge cannot be considered to have individual significance under Criteria B or D. Thus, in the absence of individual significance, regardless of physical condition, Newhalem Creek Bridge cannot be considered to have integrity that conveys individual significance under Criteria B or D. As such, the bridge is recommended not eligible for individual listing in the NRHP under Criteria B or D.

Physical description: Newhalem Creek Bridge is a single span steel beam bridge approximately 85 feet long. Parallel horizontal I-beams run the length of the span between the bridge's concrete abutments, with the metal grate deck supported by perpendicular I-beam girders placed at short regular intervals and reinforced further by slim diagonal supports below. A horizontal thrie-beam standard highway guardrail lines either side of the bridge, supported by steel I-beam rail posts spaced at regular intervals down each side of the bridge. A steel panel has been installed along the northern edge of the bridge to make it wheelchair accessible for its use as footbridge for recreational trails in the RLNRA and its thrie-beam guardrails of the Newhalem Creek Bridge are substantially dented near their western end.

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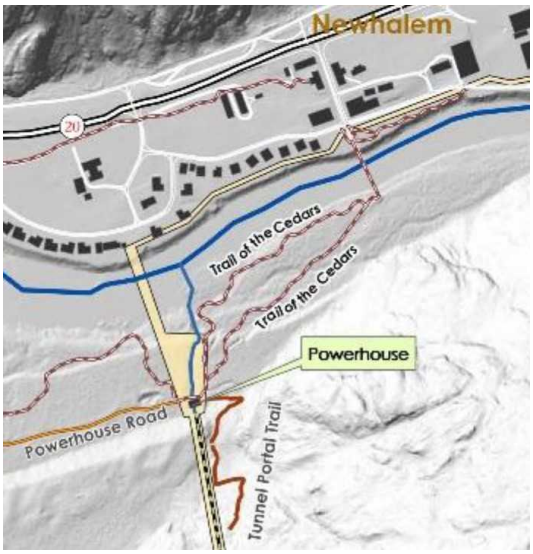
Historic Property Report

Historic Name: Trail Network

Property ID: 730063

Location



Address: Newhalem Creek

Geographic Areas: DIABLO DAM Quadrangle, T37R12E28, Whatcom County

Information

Number of stories: N/A

Construction Dates:

Construction Type	Year	Circa
Built Date	1920	☑
Remodel	1970	☐
Addition	1987	☐
Addition	1995	☑

Historic Use:

Category	Subcategory
Recreation and Culture	Recreation and Culture - Outdoor Recreation
Transportation	Transportation - Pedestrian-Related
Recreation and Culture	Recreation and Culture - Outdoor Recreation
Transportation	Transportation - Pedestrian-Related

Historic Context:

Category

Architect/Engineer:

Category	Name or Company

Thematics:

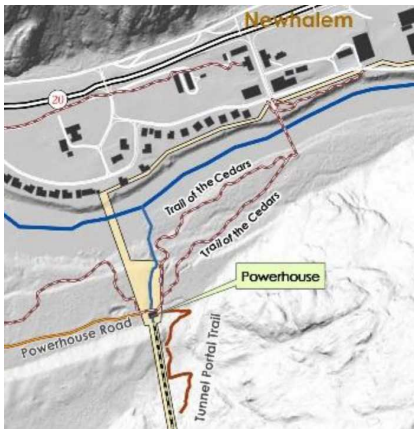
Local Registers and Districts

Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2021-08-05085, , Newhalem Creek Hydroelectric Project Decommissioning		Survey/Inventory	

Photos



Map of trail network in vicinity of powerhouse.

Trail of the Cedars c. 2021, view unknown.

Trail of the Cedars gravel surfacing and plastic barrel culvert, facing east.

Tunnel Portal Trail trailhead, facing east.

Tunnel Portal Trail boardwalk, facing south.

Tunnel Portal Trail loose rock surfacing and lumber step, facing south.

Historic Property Report

Historic Name: Trail Network Property ID: 730063

Inventory Details - 9/26/2022

Common name:

Date recorded: 9/26/2022

Field Recorder: Corey Lentz; Will Linder; January Tavel

Field Site number:

SHPO Determination

Detail Information

Characteristics:

Category	Item
Form Type	Landscape - Park

Surveyor Opinion

Property is located in a potential historic district (National and/or local): Yes

Property potentially contributes to a historic district (National and/or local): Yes

Significance narrative: This inventory recommends the Powerhouse and Dam Complex (NCPCD) trail network (hereafter referred to as the trail network), located near the town of Newhalem in Whatcom County, Washington, not eligible for individual listing in the NRHP under Criteria A, B, C, or D. However, the trail network is recommended eligible as a contributor to the Skagit River and Newhalem Creek Hydroelectric Projects (SRNCHP) (DT 66) under Criteria A and C. Supporting analysis is provided in the historic context, eligibility evaluation (significance analysis, integrity analysis, and eligibility recommendation statement), and physical description herein.

Historic Context

Prior to the development of the City of Seattle, City Light Department's (City Light) Skagit River Hydroelectric Project (SRHP), the upper Skagit River was a remote and rugged area in Whatcom County where Native American groups had lived for millennia. What eventually became the town of Newhalem was part of an extended Upper Skagit village system called k'wabacábš. Oral history and archaeological evidence indicate that the area around the powerhouse was important for hunting, gathering, and fishing (Mierendorf 1996). Euro-American miners began travelling upriver in the 1880s in search of gold, constructing rudimentary cabins at their claim sites. By the 1890s, a few homesteaders had settled along upper Skagit River in the vicinity of the future site of Newhalem to provision miners with supplies, but by the time City Light sought to develop the area as a potential site of hydroelectric power in the 1910s, the upper Skagit River remained remote and sparsely populated by Euro-Americans. (Johnson 2010:8-2–8-4).

As part of the planning process for SRHP, City Light determined it needed a small temporary hydroelectric facility sited near the work camp and construction site. This facility, the Newhalem Creek Hydroelectric Project (NCHP), was constructed on Newhalem Creek, a tributary off the south side of the Skagit River southwest of present day Newhalem. The construction of the NCHP was a perquisite for the construction of first SRHP facility, the Gorge Powerhouse and Dam Complex (GPDC), as the plant would

provide power to the construction camp that would serve as headquarters of the SRHP and would later become the town of Newhalem. The site of the NCPDC was surveyed and selected for the proposed temporary facility in the summer of 1918. (Johnson 2010:8-5).

Construction materials were transported from City Camp (present-day Town of Newhalem) to the powerhouse site using construction methods common to logging during the early 20th century. City Light constructed a cableway skidding system (also referred to as an overhead system) feeder from the railway on the north bank of the river to the powerhouse site, with which was a cableway skidding system (also referred to as an overhead system) used to move materials across the river just to the west of the suspension bridge (City Light 1919f, 1920a; Bryant 1923:504). This overhead system consisted of a set of two poles connected by a cross bar (referred to as a head spar tree) on each bank of the river, with the northern head spar tree additionally supported by a central strut (City Light 1920a; Bryant 1923:504). A cable ran between each head spar tree, with winches on either side to facilitate the movement of the traveler (the device that held materials) along the cable (City Light 1920a). This system remained in place just north of the suspension bridge through at least 1937 but was removed by the early 1950s (Figure 5) (City Light 1937 n.d.a.). After materials crossed the river, they were transported west to the powerhouse along the skid road. A skidder—a device powered by steam or electricity that operates on or near a railroad track, which moves materials by means of a cable—was installed on the hill to the east and behind the powerhouse to transport construction materials uphill from the powerhouse site to build the penstock (City Light 1920f; Bryant 1923:504).

The headworks site was accessed by a pedestrian trail, known as the Gatehouse Trail, which ascended the adjacent hillside on southwestern alignment from the powerhouse toward Newhalem Creek, and then proceeded west and south above and to the east of Newhalem creek (City Light 1920e). The alignment of the Gatehouse Trail was depicted in City Light's April of 1920 Drawing No. B-55 and again in the NCHP's 1969 FERC license application, though the trail was not explicitly identified in the latter (City Light 1920g). Construction materials for the 1921 headworks' timber crib dam and intake/gatehouse structure were sourced directly from the headworks site and surrounding area (City of Seattle 1969:Exhibit Q-1).

The NCPDC was completed in 1921, with power first produced in August of that year (Johnson 2010:7-44, 8-5). The 1921 NCPDC included a headworks on Newhalem Creek approximately one mile upstream from its confluence with the Skagit River, power tunnel, penstock, powerhouse, tailrace, and transmission line. The 1921 headworks' low log crib diversion dam that directed water into a vertical timber intake structure east of the dam connected to the power tunnel by a 55-foot-tall, 5-foot by 5-foot vertical rock shaft (City Light 1921a, 1921b, 2022:1-1; Johnson 2010:8-5). From the intake, water flowed north–northwest underground through the 2,452 feet long bored power tunnel (Johnson 2010:8-5; City Light 2022:1-1). Below ground, the power tunnel funneled water via a pipe intake bell surrounded by a concrete plug into the 925-foot penstock, of which 218 feet were located within the rock tunnel and the remaining 707 feet ran downhill to the powerhouse after daylighting from the rock tunnel (City Light 1919b; 2022:1-1; Johnson 2010:8-5). Along its descending alignment, the penstock was supported by U-shaped timber saddles, placed at regular short intervals between six thrust blocks (City Light 1920c). The penstock split as it entered the powerhouse to service each of the plant's Pelton Water Wheel Company (PWWC) double-nozzle impulse-type waterwheels, which powered a 2,000- kilovolt amperes (kVA) Westinghouse generator (City Light 1920c; Johnson 2010:8-5; Engineering World 1920:314). Water was discharged from the

powerhouse into the tailrace, which ran north to the Skagit River (Roberts 1924:952; Johnson 2010:8-5). The original 1921 NCPDC powerhouse was a rustic wood framed building with board-and-batten siding, a corrugated metal roof, and a series of wood-sashed windows along its north façade (City Light 1919a). A 6600-volt aboveground transmission line transmitted power from the powerhouse, which ran northwest over the Skagit River to the rail line in Newhalem, and then northeast to the GPDC construction site (City Light 1921c).

The NCHP provided power to the buildings of the City Camp (later Newhalem), as well as the construction of both the Gorge power tunnel and powerhouse. These competing demands on the facility's limited capacity led to power shortages and delays in the construction of the GPDC (Johnson 2010:8-6). City Light initially intended the NCHP to be a temporary facility to facilitate the construction of the City Camp and the GPDC (Johnson 2010:8-5). However, the facility remained in operation following the completion of the GPDC in 1924, with its output then routed into the larger Skagit transmission and distribution network. In this new role as a local production and support facility, the NCHP provided power for the town of Newhalem and station service power for the Gorge Powerhouse's electrically operated equipment (e.g., heating, lighting and cooling). The NCHP was semi-automated in the early 1950s, allowing it to operate largely unmanned, with manual start-up and shut-down still required (Johnson 2010:8-5). City Light redeveloped the transmission line from the powerhouse to the Gorge Powerhouse in 1965, undergrounding most of the line within the town of Newhalem and rerouting it along the north bank of the Skagit River (City Light 1965a, 1965b).

A fire in July 1966 severely damaged the powerhouse. It burned down the building, but a flange gasket in one line of the bifurcated penstock behind the powerhouse blew out, creating a 60- to 70-foot-high sheet of water behind the powerhouse preventing fire damage in the surrounding wooded area. Additionally, the equipment within the powerhouse continued to run, saving the original PWWC turbines and Westinghouse generator from warping from the heat of the fire. (Johnson 2010:8-5). After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. In 1968 City Light replaced a log stringer bridge over Newhalem Creek on Powerhouse Road with the current Newhalem Creek Bridge to access the powerhouse from the west (City Light 1968; City of Seattle 1969:Exhibit N).

The current powerhouse was constructed between 1967 and 1969 (Johnson 2010:7-44). The only major repair on the generating equipment was the rewinding of the Westinghouse generator and minor welding repair to the two PWWC turbines (Johnson 2010:8-5). The existing headworks on Newhalem Creek was also rebuilt during this period. The 1969 headworks consisted of a curved diversion dam and apron, rectangular sluice way/channel, intake and rock shaft, gatehouse, and associated concrete slabs around the gatehouse; the 1969 headworks retained the existing log footbridge that crossed from the western bank access road to the gatehouse on the eastern bank (City Light 1969a, 1969b). The redeveloped NCHP retained and continued to utilize the original power tunnel, penstock, and tailrace, which required only minor maintenance and repairs following the fire. Before going back online in 1970, the NCHP was fully automated, the first of the Skagit River facilities to undergo the process, and remote control of the newly operational powerhouse equipment was established at the Gorge Powerhouse. (Johnson 2010:7-44, 8-5, 8-46; City Light 1971:11).

The NCHP was relicensed in 1997 and continued to operate until 2010 (City Light 1992,

2022c:A-5). The NCHP has not been consistently in service since 2010 due to an automatic gate valve requiring repairs. While equipment and structural issues resulting in the 2010 shutdown were eventually addressed, subsequent issues necessitated the current decommissioning of the NCHP. In 2015, a wildfire burned many of the original wooden penstock saddles, requiring an extensive replacement project in 2016-2017. More recently, leaks in the power tunnel, maintenance needs at the headworks and powerhouse, and access road safety concerns prohibit the continued operation of the NCHP. In 2021, City Light began the process of surrendering the facility's license (City Light 2022c:vi).

Skagit River and Newhalem Creek Hydroelectric Projects NRHP Listing

The SRNCHP (DT 66) was listed in the NRHP in 1996, with the nomination updated in 2010 (Erigero 1990; Johnson 2010). As of 2010, the SRNCHP (DT 66) is listed in the NRHP as significant at the national level under Criteria A, B, and C and has a period of significance of 1917–1961, beginning in the year the SRHP was first conceptualized by City Light and ending with the completion of the Gorge High Dam. The district is listed under Criterion A, in the area of Politics and Government, because it represents almost 50 years of American utility politics and development from the Progressive Era through the decades following World War II. The projects' development ensured the existence of City Light as a municipal utility and was immensely influential on the public power movement over the course of the 20th century. The district is listed under Criterion B, in the areas of Politics and Government, Entertainment/Recreation, and Landscape Architecture, for its association with J.D. Ross, City Light Superintendent for 28 years, and Ross's vision for City Light and public power, in particular hydroelectric power. Ross was instrumental in the projects' development, but also used the projects as a showcase to promote hydroelectric power and municipal utility ownership. The district is also listed under Criterion C, in the areas of Community Planning and Development, Engineering, Architecture, and Transportation for its representation of a general trend of developing more costly and remote hydroelectric sites in the 1920s and for its new and inventive engineering practices, both in the technical construction of the facilities themselves, as well as in the development of municipally owned towns (Newhalem and Diablo, Washington) and the transportation infrastructure required for their construction (Johnson 2010:8-1–8-2).

The historic district is three miles long and extends in a discontiguous linear manner along the north and south banks of, over and across the Skagit River within the Ross Lake National Recreation Area (RLNRA). Starting in Newhalem and extending east to Ross Dam, it includes the sequence of towns and industrial resources related to the SRNCHP (DT 66) and is grouped into seven discrete historic areas: Historic Area A – Town of Newhalem; Historic Area B – Gorge Powerhouse and Dam Complex; Historic Area C – Diablo Powerhouse Complex; Historic Area D Discontiguous Resources – Diablo Lake; Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site; Historic Area E – Ross Powerhouse and Dam Complex; and Historic Area F – Hollywood Residential Area. The lakes formed by the dams are not included in the district. (Johnson 2010:7-2).

Property Development

The trail network is in Sections 21 and 28 of Township 37 North, Range 12 East within the boundaries of the RLNRA. The trail network in the vicinity of the NCPDC includes two trails, the Trail of the Cedars and the Tunnel Portal Trail.

The Trail of the Cedars, first constructed in c. 1920 and redeveloped in 1969, is a 0.6-mile loop northwest of the powerhouse in the forested area along the south bank of the Skagit River (City Light 1992:7-2, 2022c:E-38; Johnson 2010:8-50). The southern segment of the current Trail of the Cedars loop was developed in c. 1920 on the alignment of the skid road built during the construction of the 1921 NCPDC powerhouse (City Light 1920e; City Light 1920g). This first iteration of the Trail of the Cedars was used as part of City Light's SRHP tours in the 1920s and 1930s. After an "ample meal served in the huge community hall" the first evening of the two-day tour, guides led visitors over a pedestrian bridge and through a "pleasant woodland trail" to Newhalem Creek, where the small powerhouse stood as a point of interest among the majestic cedars (Federal Writers Project 1941:513; Johnson 2010:50). It is unknown if the trail was given a name at the time, or if it was, what name it was known by. This original alignment of the Trail of the Cedars, as a recreational trail, was mapped in 1963 and again in 1969, with a northeasterly alignment from the Powerhouse to the Skagit/Newhalem – Trail of the Cedars Suspension Bridge (USGS 1963). The Trail of the Cedars was expanded in 1969, with a second segment added closer to the riverbank to create the current loop, with the trail's original alignment from the bridge to the powerhouse retained as the trail's southern segment (City Light 1992:7-2). The expansion project was completed by City Light in collaboration with the University of Washington's College of Forest Resources as part of City Light's effort to incorporate the reconstructed powerhouse into its promotional tours during this period (City Light 1971c:11). The Trail of the Cedars is graveled and generally oriented northeast–southwest within a heavily forested flat area between the powerhouse and the Skagit/Newhalem – Trail of the Cedars Suspension Bridge. Several plastic barrel drainage culverts cross the trail at natural drainage points, and signage interpreting its botanical species has been placed along the trail. Since its expansion, the alignment of the Trail of the Cedars has not been altered and its surfacing materials are well maintained and in good condition.

The Tunnel Portal Trail (now part of the SRHP Emergency Access Trail) was likely constructed by City Light during the 1967–1970 redevelopment of the NCHP as an access trail to facilitate maintenance of the penstock and power tunnel following the 1966 fire. The trail was mapped as an existing trail in 1987 in City Light construction drawings for maintenance of the penstock (City Light 1987b.) The Tunnel Portal Trail's alignment from the powerhouse to the penstock incorporated a segment of the Gatehouse Trail, the original access trail to the headworks from the powerhouse (City Light 1920 g; City Light 1992:7-4). From a point above the powerhouse and to the east of the penstock, the Tunnel Portal Trail branches south off the Gatehouse Trail segment and ascends the hill to the northern terminus of the power tunnel. The alignment of the Tunnel Portal Trail has been retained since its construction. Its surfacing materials are well maintained with gravel along the incorporated Gatehouse Trail segment and wood plank boardwalks have been built over natural drainages. However, the trail surface gradually transitions to loose rock at higher elevations, and several timber steps built into the hillside to prevent further erosion.

National Register of Historic Places Eligibility Evaluation

Significance Analysis

National Register of Historic Places Criterion A

The trail network is significant to the NCPDC and SRNCHP (DT 66) under Criterion A for its

association with the 1918–1921 development of the NCHP for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem and City Light's use of the powerhouse throughout the 20th century in its promotional and interpretive tours. Following the completion of the 1921 powerhouse, the alignment of 1920 skid road between the site of current Skagit/Newhalem – Trail of the Cedars Suspension Bridge and the 1921 powerhouse was redeveloped as a pedestrian train used as part of City Light's promotional tours (Johnson 2010:50; Sneddon 2022:4)). The current looped Trail of the Cedars was developed in 1969 as part of City Light's efforts to further incorporate the reconstructed powerhouse into its promotional tours during this period (City Light 1992:7-2; Sneddon 2022:4). The Tunnel Portal Trail was likely developed during the 1969–1970 redevelopment of the NCPDC to facilitate maintenance of the penstock and power tunnel after the 1966 fire; the lower portion of the Tunnel Portal Trail incorporated a segment of the Gatehouse Trail from the powerhouse to the penstock.

Given its significant historic associations with the initial hydroelectric development of the NCHP and the SRHP, and with City Light's use of these facilities as part of their promotional tours, the trail network is considered significant as a contributor to the NCPDC historic area and the SRNCHP (DT 66). However, it is not considered to be individually significant under Criterion A because most of its significance derives from the inter-relationship of this resource with other components of the NCPDC and SRNCHP (DT 66).

National Register of Historic Places Criterion B

While the Trail of the Cedars was developed during Ross' tenure as Superintendent of City Light, available documentation does not suggest that Ross was involved in its planning and construction in a similar manner to other components of the NCPDC. Rather, the Trail of the Cedars was first a skid road to the powerhouse construction site built to facilitate construction activities. Similarly, though the Trail of the Cedars was redeveloped as a pedestrian trail following the completion of the NCPDC and used during City Light's 1920s and 1930s promotional tours organized by Ross, the trail's function as part of those tours was far more limited than properties more closely associated with Ross's tours, such as Ladder Creek Falls Gardens, serving merely as an access route to the powerhouse. Though the Tunnel Portal incorporated a segment of the Gatehouse Trail as part of its alignment, the trail was developed during the 1967–1970 redevelopment of the NCHP and thus does not share any association with Ross. As such, the trail network cannot be considered to have significant associations with J.D. Ross. Furthermore, research provided no indication that any other individuals potentially associated with the property played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2020). Thus, the trail network is not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

National Register of Historic Places Criterion C

The two trails included in the trail network, the Trail of the Cedars and Tunnel Portal Trail, were developed by City Light. The trails have varying degrees of design intent and continued maintenance and use. The Trail of the Cedars, developed c. 1920, does include some associated features typical of designed trails, such as its gravel surfacing materials, culverts (plastic barrel in this case), and signage. However, these are modern alterations to the trail and not documented as original design features. It also lacks other common

features such as delineated path boundaries in the form of fencing or curbing and constructed benches or viewing platforms (Coffin Brown n.d.:14). The Tunnel Portal Trail, likely constructed in 1967–1970, also includes features such as gravel surfacing and wood plank boardwalks over natural drainages. However, these are not significant design features, and the trail lacks features of designed trails. As such, the trail network is not considered significant under Criterion C, individually or as a contributor to the NCPDC historic area and the SRNCHP (DT 66).

National Register of Historic Places Criterion D

The trail network includes common examples of access trails that do not provide important information about the general trends in trail construction or design that occurred in Washington during the 20th century that cannot be obtained through documentary sources. Therefore, the trail network has not yielded and is not likely to yield information important in prehistory or history. For this reason, the trail network cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Integrity Analysis

Integrity is defined as the ability of a property to convey historic significance through its character-defining physical features, as expressed through integrity of location, setting, design, materials, workmanship, feeling, and association.

The trail network's retains integrity of location and setting. The historic alignment of the Trail of the Cedars has been retained as the southern segment of the current loop and alignment of the Tunnel Portal Trail has not changed, including the incorporated segment of the Gatehouse Trail in its alignment. The trail network's setting with a forested and mountainous setting on the south side of the Skagit River has been largely consistent since the various periods of development for its constituent components. While the redevelopment of the powerhouse occurred in the vicinity of the Trail of the Cedars and Tunnel Portal Trail, the 1969 powerhouse had a limited impact on the setting of these trails due to its compatibility with the 1921 building and its surrounding landscape.

The trail network integrity of design and materials has been slightly affected by the expansion of the Trail of the Cedars into a loop and the introduction of small-scale features along its alignment, and the introduction of small-scale features along its alignment. However, the current Trail of the Cedars loop incorporated its historic alignment as the southern of its two segments, limiting the impact of this alteration. The Tunnel Portal Trail alignment has not changed and the design features such as its boardwalks remain intact. Additionally, the gravel surfacing of the Trail of the Cedars has been well maintained and would be compatible with its original natural surfacing materials. The lower segment of the Tunnel Portal Trail, formerly part of the Gatehouse Trail, is also well maintained and its gravel surfacing would be compatible with its original natural surfacing materials, though the Tunnel Portal Trail's upper segment suffers from erosion and vegetation overgrowth causing the loss of its surfacing materials. The trail network's integrity of workmanship has been slightly affected, corresponding to the noted alterations to the Trail of the Cedar's design and materials. However, the trail network was already limited in this aspect, as both the Trail of the Cedars and Gatehouse Trail section of the Tunnel Portal Trail were originally developed as simple footpaths and lack elaborate design features that better exemplify workmanship in trail design and construction.

The trail network retains integrity of feeling and association as the Trail of the Cedars has retained its interpretive and recreational aspects and can still be experienced in largely the same setting as during its period of construction. Likewise, the Tunnel Portal Trail has not been altered and its setting behind (south) and above the powerhouse has not changed. Moreover, The Trail of the Cedars retains its close association with the powerhouse as a recreational and interpretive trail between the town of Newhalem and the powerhouse and the Tunnel Portal Trail retains its own associations with the penstock and power tunnel as a maintenance access trail and with the SRHP as an emergency evacuation route.

Overall, the trail network meets all seven aspects of integrity. The trail network retains integrity in location, setting, design, materials, workmanship, feeling, and association. As such, the trail network retains integrity to convey its significance under Criterion A as a contributor to the SRNCHP (DT 66) historic district.

Eligibility Recommendation

Eligibility as a District Contributor

The trail network is within the boundaries of a NRHP-listed historic district, the SRNCHP (DT 66), which was listed in the NRHP in 1996 (and updated in 2010) under Criteria A, B, and C with a period of significance of 1917–1961. The trail network was not previously identified as a component of the Newhalem Creek Powerhouse Site, which was listed in the NRHP as a contributing resource to the SRNCHP (DT 66) in the district's Historic Area D, Single Non-Contiguous Resources. (Erigero 1990:7-4; Johnson 2010:7-82).

This study reconsiders the Newhalem Powerhouse Site as a new historic area within the SRNCHP (DT 66) historic district, the Newhalem Creek Powerhouse and Dam Complex, with an expanded period of significance of 1918–1970, beginning with the planning and construction of the NCHP and ending with the year the reconstructed NCHP began producing power. The trail network is recommended eligible for listing in the NRHP as a contributor to the SRNCHP (DT 66) under Criterion A, in the newly recommended historic area.

The trail network is recommended eligible as a contributor to the SRNCHP (DT 66) under Criterion A for its significant associations with the 1918–1921 development of the NCHP for the purpose of producing power for the SRHP construction workcamps, construction of the GPDC and the town of Newhalem and City Light's use of the powerhouse throughout the 20th century in its promotional and interpretive tours. The trail network retains integrity to convey this significance under Criterion A during the 1920–1970 period, representing the development of the Trail of the Cedars as an access trail used in City Light's promotional tours of the NCPDC powerhouse and SRHP, the development of the Tunnel Portal Trail during the redevelopment of the NCHP, and the expansion of the Trail of the Cedars to better incorporate the reconstructed NCPDC powerhouse into City Light's promotional tours.

The trail network does not share the district's association with Ross and represents a common form of its trail design and construction. Therefore, the trail network is not recommended as a contributing resource to the SRNCHP (DT 66) under Criteria B or C.

Individual NRHP Eligibility

The trail network has significant associations under Criterion A and retains integrity to convey this significance, as discussed previously. However, these associations derive their significance from the broader context of the NCHP's development and its association with the SRHP and cannot be represented by the trail network alone. Thus, in the absence of individual significance, regardless of physical condition, the trail network cannot be considered to have integrity that conveys individual significance under Criterion A. As such, the trail network is recommended not eligible for individual listing in the NRHP under Criterion A.

Without meaningful connection to an individual important to history, lacking individual design or construction significance, and unable to yield information important to prehistory or history, the headworks cannot be considered to have individual significance under Criteria B, C, or D and is not recommended eligible for individual listing in the NRHP under those criteria.

Physical description:

The trail network in the vicinity of the NHCP includes two trails, the Trail of the Cedars and the Tunnel Portal Trail. The Trail of the Cedars is graveled and generally oriented northeast–southwest within a heavily forested flat area between the powerhouse and the Trail of the Cedars Suspension Bridge. Several plastic barrel drainage culverts cross the trail at natural drainage points and signage interpreting its botanical species has been placed along the trail. Since its expansion, the alignment of the Trail of the Cedars has not been altered and its surface materials are well maintained. The Tunnel Portal Trail begins immediately to the east of the powerhouse, the trail climbs the hill to the south in a series of switchbacks to the northern terminus of the power tunnel. This trail is maintained with gravel toward the bottom of the hill but gradually transitions to loose rock with several lumber steps built into the hillside. At several points, short wood plank boardwalks have been constructed over natural drainage lines down the hillside. Although the alignment of the Tunnel Portal Trail has been retained, its surfacing materials are maintained only at its lower elevations while the upper elevations suffer from erosion and vegetation overgrowth. Considering the condition of its individual components, the trail network overall is in good condition.

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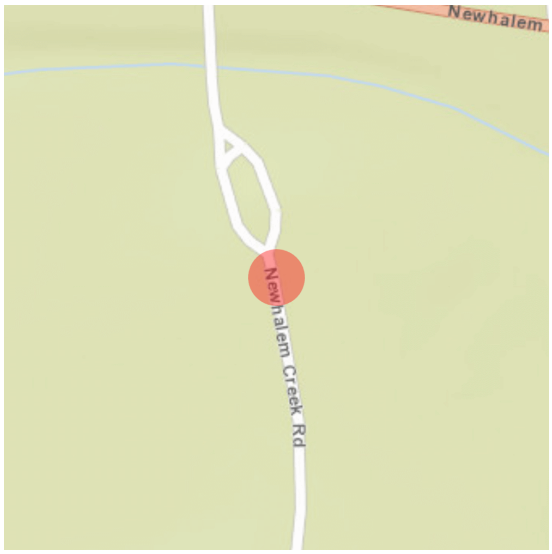
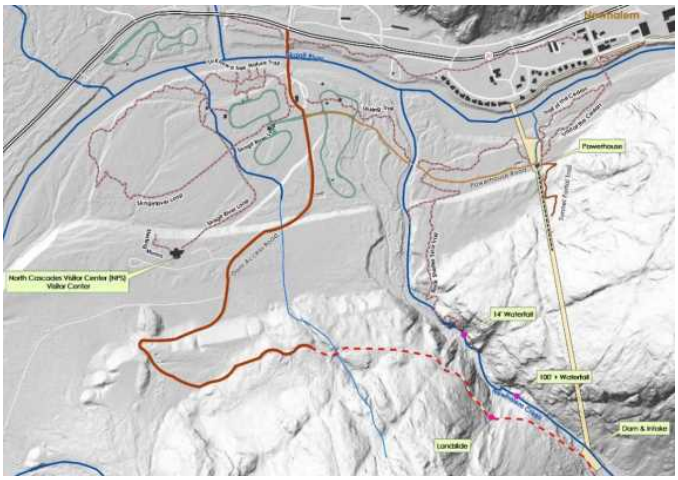
Historic Property Report

Historic Name: Access Roads

Property ID: 730064

Location





Address: Newhalem Creek

Geographic Areas: T37R12E20, Whatcom County

Information

Number of stories: N/A

Construction Dates:

Construction Type	Year	Circa
Built Date	1953	☑
Built Date	1968	☑

Historic Use:

Category	Subcategory
Transportation	Transportation - Road-Related (vehicular)
Transportation	Transportation - Road-Related (vehicular)

Historic Context:

Category

Architect/Engineer:

Category	Name or Company

Historic Property Report

Historic Name: Access Roads

Property ID: 730064

Thematics:

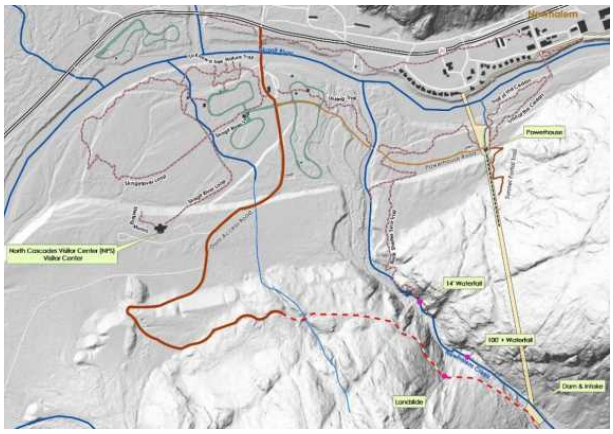
Local Registers and Districts

Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2021-08-05085, , Newhalem Creek Hydroelectric Project Decommissioning		Survey/Inventory	

Photos



Map of access roads in vicinity of NCPDC.

Dam Access Road at switchback east, facing west.

Dam Access Road transitions to two-track road, facing east.

Dam Access Road at landslide closure point, facing southeast.

Dam Access Road between landslide and headworks, facing southeast.

Dam Access Road at landslide, facing north. Detail metal netting for road surfacing retention exposed through landslide.

Powerhouse Road transitions from paving to gravel leaving Newhalem Creek Campground, facing east.

Powerhouse Road approaching powerhouse, facing west.

Historic Property Report

Historic Name: Access Roads Property ID: 730064

Inventory Details - 9/26/2022

Common name:

Date recorded: 9/26/2022

Field Recorder: Corey Lentz; Will Linder; January Tavel

Field Site number:

SHPO Determination

Detail Information

Surveyor Opinion

Property is located in a potential historic district (National and/or local): Yes

Significance narrative: This inventory recommends the Newhalem Creek Hydroelectric Project (NCHP) area access roads (hereafter referred to as the access roads), located near the town of Newhalem in Whatcom County, Washington, not eligible for individual listing in the NRHP under Criteria A, B, C, or D and not eligible for listing in the NRHP as a contributor to the Skagit River and Newhalem Creek Hydroelectric Projects (SRNCHP) DT 66 under Criteria A, B, C, or D. Supporting analysis is provided in the historic context below, eligibility evaluation (significance analysis, integrity analysis, and eligibility recommendation statement), and physical description herein.

Historic Context

Prior to the development of the City of Seattle, City Light Department's (City Light) Skagit River Hydroelectric Project (SRHP), the upper Skagit River was a remote and rugged area in Whatcom County where Native American groups had lived for millennia. What eventually became the town of Newhalem was part of an extended Upper Skagit village system called k'wabacábš. Oral history and archaeological evidence indicate that the area around the powerhouse was important for hunting, gathering, and fishing (Mierendorf 1996). Euro-American miners began travelling upriver in the 1880s in search of gold, constructing rudimentary cabins at their claim sites. By the 1890s, a few homesteaders had settled along upper Skagit River in the vicinity of the future site of Newhalem to provision miners with supplies, but by the time City Light sought to develop the area as a potential site of hydroelectric power in the 1910s, the upper Skagit River remained remote and sparsely populated by Euro-Americans. (Johnson 2010:8-2–8-4).

As part of the planning process for SRHP, City Light determined it needed a small temporary hydroelectric facility sited near the work camp and construction site. This facility, the Newhalem Creek Hydroelectric Project (NCHP), was constructed on Newhalem Creek, a tributary off the south side of the Skagit River southwest of present day Newhalem. The construction of the NCHP was a perquisite for the construction of first SRHP facility, the Gorge Powerhouse and Dam Complex (GPDC), as the plant would provide power to the construction camp that would serve as headquarters of the SRHP and would later become the town of Newhalem. The site of the NCPDC was surveyed and selected for the proposed temporary facility in the summer of 1918. (Johnson 2010:8-5).

Construction materials were transported from City Camp (present-day Town of Newhalem) to the powerhouse site using construction methods common to logging during the early 20th century. City Light constructed a cableway skidding system (also

referred to as an overhead system) feeder from the railway on the north bank of the river to the powerhouse site, with which was a cableway skidding system (also referred to as an overhead system) used to move materials across the river just to the west of the suspension bridge (City Light 1919f, 1920a; Bryant 1923:504). This overhead system consisted of a set of two poles connected by a cross bar (referred to as a head spar tree) on each bank of the river, with the northern head spar tree additionally supported by a central strut (City Light 1920a; Bryant 1923:504). A cable ran between each head spar tree, with winches on either side to facilitate the movement of the traveler (the device that held materials) along the cable (City Light 1920a). This system remained in place just north of the suspension bridge through at least 1937 but was removed by the early 1950s (Figure 5) (City Light 1937 n.d.a.). After materials crossed the river, they were transported west to the powerhouse along the skid road. A skidder—a device powered by steam or electricity that operates on or near a railroad track, which moves materials by means of a cable—was installed on the hill to the east and behind the powerhouse to transport construction materials uphill from the powerhouse site to build the penstock (City Light 1920f; Bryant 1923:504).

The headworks site was accessed by a pedestrian trail, known as the Gatehouse Trail, which ascended the adjacent hillside on southwestern alignment from the powerhouse toward Newhalem Creek, and then proceeded west and south above and to the east of Newhalem creek (City Light 1920e). The alignment of the Gatehouse Trail was depicted in City Light's April of 1920 Drawing No. B-55 and again in the NCHP's 1969 FERC license application, though the trail was not explicitly identified in the latter (City Light 1920g). Construction materials for the 1921 headworks' timber crib dam and intake/gatehouse structure were sourced directly from the headworks site and surrounding area (City of Seattle 1969:Exhibit Q-1).

The NCPDC was completed in 1921, with power first produced in August of that year (Johnson 2010:7-44, 8-5). The 1921 NCPDC included a headworks on Newhalem Creek approximately one mile upstream from its confluence with the Skagit River, power tunnel, penstock, powerhouse, tailrace, and transmission line. The 1921 headworks' low log crib diversion dam that directed water into a vertical timber intake structure east of the dam connected to the power tunnel by a 55-foot-tall, 5-foot by 5-foot vertical rock shaft (City Light 1921a, 1921b, 2022:1-1; Johnson 2010:8-5). From the intake, water flowed north–northwest underground through the 2,452 feet long bored power tunnel (Johnson 2010:8-5; City Light 2022:1-1). Below ground, the power tunnel funneled water via a pipe intake bell surrounded by a concrete plug into the 925-foot penstock, of which 218 feet were located within the rock tunnel and the remaining 707 feet ran downhill to the powerhouse after daylighting from the rock tunnel (City Light 1919b; 2022:1-1; Johnson 2010:8-5). Along its descending alignment, the penstock was supported by U-shaped timber saddles, placed at regular short intervals between six thrust blocks (City Light 1920c). The penstock split as it entered the powerhouse to service each of the plant's Pelton Water Wheel Company (PWWC) double-nozzle impulse-type waterwheels, which powered a 2,000- kilovolt amperes (kVA) Westinghouse generator (City Light 1920c; Johnson 2010:8-5; Engineering World 1920:314). Water was discharged from the powerhouse into the tailrace, which ran north to the Skagit River (Roberts 1924:952; Johnson 2010:8-5). The original 1921 NCPDC powerhouse was a rustic wood framed building with board-and-batten siding, a corrugated metal roof, and a series of wood-sashed windows along its north façade (City Light 1919a). A 6600-volt aboveground transmission line transmitted power from the powerhouse, which ran northwest over the Skagit River to the rail line in Newhalem, and then northeast to the GPDC construction site (City Light 1921c).

The NCHP provided power to the buildings of the City Camp (later Newhalem), as well as the construction of both the Gorge power tunnel and powerhouse. These competing demands on the facility's limited capacity led to power shortages and delays in the construction of the GPDC (Johnson 2010:8-6). City Light initially intended the NCHP to be a temporary facility to facilitate the construction of the City Camp and the GPDC (Johnson 2010:8-5). However, the facility remained in operation following the completion of the GPDC in 1924, with its output then routed into the larger Skagit transmission and distribution network. In this new role as a local production and support facility, the NCHP provided power for the town of Newhalem and station service power for the Gorge Powerhouse's electrically operated equipment (e.g., heating, lighting and cooling). The NCHP was semi-automated in the early 1950s, allowing it to operate largely unmanned, with manual start-up and shut-down still required (Johnson 2010:8-5). City Light redeveloped the transmission line from the powerhouse to the Gorge Powerhouse in 1965, undergrounding most of the line within the town of Newhalem and rerouting it along the north bank of the Skagit River (City Light 1965a, 1965b).

A fire in July 1966 severely damaged the powerhouse. It burned down the building, but a flange gasket in one line of the bifurcated penstock behind the powerhouse blew out, creating a 60- to 70-foot-high sheet of water behind the powerhouse preventing fire damage in the surrounding wooded area. Additionally, the equipment within the powerhouse continued to run, saving the original PWWC turbines and Westinghouse generator from warping from the heat of the fire. (Johnson 2010:8-5). After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. After the fire, City Light began planning for the reconstruction of the powerhouse to resume service. In 1968 City Light replaced a log stringer bridge over Newhalem Creek on Powerhouse Road with the current Newhalem Creek Bridge to access the powerhouse from the west (City Light 1968; City of Seattle 1969:Exhibit N).

The current powerhouse was constructed between 1967 and 1969 (Johnson 2010:7-44). The only major repair on the generating equipment was the rewinding of the Westinghouse generator and minor welding repair to the two PWWC turbines (Johnson 2010:8-5). The existing headworks on Newhalem Creek was also rebuilt during this period. The 1969 headworks consisted of a curved diversion dam and apron, rectangular sluice way/channel, intake and rock shaft, gatehouse, and associated concrete slabs around the gatehouse; the 1969 headworks retained the existing log footbridge that crossed from the western bank access road to the gatehouse on the eastern bank (City Light 1969a, 1969b). The redeveloped NCHP retained and continued to utilize the original power tunnel, penstock, and tailrace, which required only minor maintenance and repairs following the fire. Before going back online in 1970, the NCHP was fully automated, the first of the Skagit River facilities to undergo the process, and remote control of the newly operational powerhouse equipment was established at the Gorge Powerhouse. (Johnson 2010:7-44, 8-5, 8-46; City Light 1971:11).

The NCHP was relicensed in 1997 and continued to operate until 2010 (City Light 1992, 2022c:A-5). The NCHP has not been consistently in service since 2010 due to an automatic gate valve requiring repairs. While equipment and structural issues resulting in the 2010 shutdown were eventually addressed, subsequent issues necessitated the current decommissioning of the NCHP. In 2015, a wildfire burned many of the original wooden penstock saddles, requiring an extensive replacement project in 2016-2017. More recently, leaks in the power tunnel, maintenance needs at the headworks and powerhouse, and access road safety concerns prohibit the continued operation of the

NCHP. In 2021, City Light began the process of surrendering the facility's license (City Light 2022c:vi).

Skagit River and Newhalem Creek Hydroelectric Projects NRHP Listing

The SRNCHP (DT 66) was listed in the NRHP in 1996, with the nomination updated in 2010 (Erigero 1990; Johnson 2010). As of 2010, the SRNCHP (DT 66) is listed in the NRHP as significant at the national level under Criteria A, B, and C and has a period of significance of 1917–1961, beginning in the year the SRHP was first conceptualized by City Light and ending with the completion of the Gorge High Dam. The district is listed under Criterion A, in the area of Politics and Government, because it represents almost 50 years of American utility politics and development from the Progressive Era through the decades following World War II. The projects' development ensured the existence of City Light as a municipal utility and was immensely influential on the public power movement over the course of the 20th century. The district is listed under Criterion B, in the areas of Politics and Government, Entertainment/Recreation, and Landscape Architecture, for its association with J.D. Ross, City Light Superintendent for 28 years, and Ross's vision for City Light and public power, in particular hydroelectric power. Ross was instrumental in the projects' development, but also used the projects as a showcase to promote hydroelectric power and municipal utility ownership. The district is also listed under Criterion C, in the areas of Community Planning and Development, Engineering, Architecture, and Transportation for its representation of a general trend of developing more costly and remote hydroelectric sites in the 1920s and for its new and inventive engineering practices, both in the technical construction of the facilities themselves, as well as in the development of municipally owned towns (Newhalem and Diablo, Washington) and the transportation infrastructure required for their construction (Johnson 2010:8-1–8-2).

The historic district is three miles long and extends in a discontiguous linear manner along the north and south banks of, over and across the Skagit River within the Ross Lake National Recreation Area (RLNRA). Starting in Newhalem and extending east to Ross Dam, it includes the sequence of towns and industrial resources related to the SRNCHP (DT 66) and is grouped into seven discrete historic areas: Historic Area A – Town of Newhalem; Historic Area B – Gorge Powerhouse and Dam Complex; Historic Area C – Diablo Powerhouse Complex; Historic Area D Discontiguous Resources – Diablo Lake; Historic Area D Discontiguous Resources – Newhalem Creek Powerhouse Site; Historic Area E – Ross Powerhouse and Dam Complex; and Historic Area F – Hollywood Residential Area. The lakes formed by the dams are not included in the district. (Johnson 2010:7-2).

Property Development

The access roads are in Sections 20, 28 and 29 of Township 37 North, Range 12 East within the boundaries of the RLNRA, a subunit of the National Parks Service (NPS) North Cascades National Park Service Complex. The roads are located on the south side of the Skagit River near Newhalem in Whatcom County, Washington. The access roads in the vicinity of the NHCP include two roads, the Dam Access Road and Powerhouse Road.

The road referred to as the Dam Access Road provides access to the headworks from the west side of Newhalem Creek, although the road was not constructed by City Light, and it is not associated with the NCHP's 1919–1921 development. However, Dam Access Road was used by City Light during the redevelopment of the headworks in 1967–1969 to

transport equipment and materials to the headworks site. Limited information is available related to the development of the Dam Access Road. Based on available historic maps and contextual information, it is estimated to have been constructed between 1919 and 1953 in relation to USFS timbering activities in this area. In 1919, transportation routes along the Skagit River in the vicinity of Newhalem consisted of a single unimproved road or trail along the north side of the Skagit River; no roads or trails were mapped along the south side of the river (City Light 1919d). Access to the south side of the river was first provided during the early 20th century by a log bridge built by USFS prior to 1953—replaced by the USFS constructed Skagit River Bridge in 1959—and early logging roads were developed, including the unimproved road that would become known as Dam Access Road (USGS 1953; Neely 2020:6).

The 1953 alignment of the road generally followed the current alignment, proceeding south from the North Cascades Highway (State Route 20) across the Skagit River. On the south side of the river, it continued south and then southwest, with short branches off the road's eastern and southern sides, before turning back east to Newhalem Creek and running south along the cliff above the creek past the headworks into the backcountry (USGS 1953). Maps and historic aerials of the area since 1953 show that alignment of Dam Access Road has remained roughly the same since 1953 (USGS 1958, 1979, 1989, 1999, 2011; City of Seattle 1969:Exhibit L).

The road was improved in the late 1980s, as depicted in a 1989 USGS map from State Road 20 to the point at which it crossed an unnamed creek west of Newhalem Creek (USGS 1979, 1989; NETR 1984). This improvement was likely limited to widening and graveling, as the road did not appear to be paved until 1998 in historic aerial photographs; at that time only the northern segment from State Route 20 to the entrance for the North Cascades Visitor Center (NCVC) parking lot was paved, suggesting that these improvements were undertaken by NPS within the vicinity of its facilities (NETR 1984, 1998). No further changes to the Dam Access Road's design or materials have occurred since 1998. The road's surface materials between State Route 20 and the NCVC parking lot are well maintained and in good condition, with condition gradually deteriorating from that point to where vehicle access ends. However, the section of Dam Access Road that continues to the headworks and beyond (south of) along Newhalem Creek has been abandoned and is informally used as a trail to access the backcountry in the upper portions of the drainage. The road was closed to vehicles in 2019 beginning at a point approximately 0.3-mile northwest of the headworks, where a landslide has covered the road. Light vegetative overgrowth obscures the road between this point and the headworks, becoming more heavily overgrown beyond the headworks, obscuring the road completely. However, Dam Access Road south of the headworks was not documented.

Though colloquially named for the access it currently provides to the powerhouse from the west side of Newhalem Creek, Powerhouse Road was also not constructed by City Light, and it is not associated with either the NCHP's 1919–1921 development. However, Powerhouse Road was used by City Light during the reconstruction of the powerhouse in 1967–1969 to transport equipment and materials to the powerhouse site. Powerhouse Road is estimated to have been constructed between 1958 and 1969. The road is not present in the 1958 USGS topographical map of the area and was first depicted in a 1969 City Light topographical map of the redeveloped NCPDC (USGS 1958; City Light 1969c). Archival City Light construction documents do not indicate that City Light constructed Powerhouse Road, and it predates the establishment of the RLNRA and NPS's federal jurisdiction in this area, suggesting Powerhouse Road was likely a logging road developed

by USFS.

The 1969 alignment of Powerhouse Road ran east and southeast from Dam Access Road, across the Newhalem Creek Bridge over Newhalem Creek, and terminated at the powerhouse (City Light 1969c). Like Dam Access Road, Powerhouse Road appears to retain its original alignment, but was improved similarly with widening and graveling in the late 1980s and paved in the 1990s (USGS 1979, 1989; NETR 1984). However, this change only occurred within the Newhalem Creek Campground and remained unimproved along the remainder of its alignment east of the eastern Newhalem Creek Campground loop, suggesting that these improvements were undertaken by NPS within the vicinity of its facilities (NETR 1984, 1998; USGS 1989). No further changes to Powerhouse Road's design or materials have occurred since 1998. The road's surface material is well maintained and in good condition.

National Register of Historic Places Eligibility Evaluation

Significance Analysis

National Register of Historic Places Criterion A

The access roads have associations with 20th century developments in the area west of Newhalem Creek, including early 20th century USFS timbering activities and NPS's development of the Newhalem Campground and NCVC in the latter decades of the 20th century. Dam Access Road is referred to as an "old logging road" in the NCHP's NPS's 1970 North Cascades Master Plan 1992 FERC license application and Powerhouse Road was likely developed for USFS timbering activities in the area as well, given its estimated period of construction during USFS jurisdiction of the area (City Light 1992a:6-8–6-9; National Park Service Complex 1970:24). The two roads were also identified in 1969 as motor nature trails proposed by NPS for recreational developments in the newly established RLNRA (City of Seattle 1969:Exhibit R). While these individual components have associations with 20th century USFS and NPS activities in their vicinity, they overall lack a cohesive period of development or documentation of development related to specific activities. Additionally, though the access roads facilitate vehicular and foot traffic to the headworks and powerhouse, these roads were not constructed by City Light as part of either the NCHP's 1919–1921 development or redevelopment in 1967–1970. While both were used during the 1967–1970 period to transport labor, equipment, and construction materials to the headworks and powerhouse sites, this is not sufficient to establish an association with City Light or the NCPDC. As such, the access roads are not considered significant under Criterion A, individually or as a contributor to the NCPDC and the SRNCHP (DT 66).

National Register of Historic Places Criterion B

Available information related to the development of the access roads did not suggest any association with significant individuals associated with City Light, USFS, or NPS during those agency's respective periods of development at or within the vicinity of the NCHP. Furthermore, research provided no indication that any other individuals potentially associated with the access roads played a significant role in national, regional, or local history (Seattle Times Historical Archives 1895–2021). As such, the access roads are not considered significant as a district contributor or individually significant to the NCPDC or the SRNCHP (DT 66) under Criterion B.

National Register of Historic Places Criterion C

The access roads—Dam Access Road, constructed between 1919 and 1953, and Powerhouse Road, constructed between 1958 and 1968, were likely developed by USFS. The roads are common examples of remote road construction and share a common trend in their development. Constructed first as an unimproved dirt road and later improved with widening, and new surfacing materials, this is a common developmental trend for remote access roads redeveloped for other uses such as recreation or forest management in USFS forest areas and does not conclusively represent design intent for specific purposes. As such, the access roads are not considered significant under Criterion C, individually or as a contributor to the NCPDC historic area and the SRNCHP (DT 66).

National Register of Historic Places Criterion D

The access roads are common examples of remote roads that do not provide important information about the general trends in road construction or design that occurred in Washington during the 20th century that cannot be obtained through documentary sources. Therefore, the access roads have not yielded and are not likely to yield information important in prehistory or history. For this reason, the access roads cannot be considered a district contributor or individually significant under Criterion D to the NCPDC or the SRNCHP (DT 66).

Integrity Analysis

Integrity is defined as the ability of a property to convey historic significance through its character-defining physical features, as expressed through integrity of location, setting, design, materials, workmanship, feeling, and association.

The access roads retain integrity in location and setting. Dam Access Road and Powerhouse Road both remain in their approximate original locations with minimal alterations to their alignments. While the access roads integrity of setting has been diminished by the construction of the Newhalem Creek Campground and NCVC, the roads' setting outside the immediate vicinity of NPS facilities is consistent with the forested and mountainous setting of their respective periods of development. The access roads retain integrity of design. The respective alignment of each road is the most important aspect of their design and does not appear to have been changed. Each road does appear to have been slightly widened, but this change in design is not substantial. The access roads' integrity of materials has been slightly diminished by their partial paving in the vicinity of NPS facilities and is otherwise graveled. Though no documentation is available to suggest either road was originally surface with gravel or was simply dirt, the use of these different natural materials is a noted change but is not as severe as the roads' paving. The limited workmanship involved in the simple construction of the access roads has likewise been diminished by these minor changes to their design and materials. The access roads' integrity of feeling has been diminished by the construction of the Newhalem Creek Campground and NCVC, which intrude on the roads' otherwise remote and undeveloped setting. However, outside the immediate vicinity of NPS facilities the access roads reflect more fully their remote setting and simple construction. The access roads' integrity of association has been diminished by its disconnection from the USFS since the establishment of the RLNRA in 1968 and the subsequent change in federal administration. However, the roads remain connected to State Route 20 via the Skagit River Bridge and are closely linked with the NPS facilities in

their vicinity.

Overall, the access roads meet the majority of the seven aspects of integrity. The access roads retain integrity in location. While property's integrity of setting, design, and materials, workmanship, feeling, and association has been slightly diminished by minor alterations to the widths and materials of Dam Access Road and Powerhouse Road, as well as the development of the Newhalem Creek Campground and NCVC in their vicinity. However, in the absence of significance, regardless of physical condition, the access roads cannot be considered to have integrity that conveys significance under Criteria A, B, C, or D.

Eligibility Recommendation

Eligibility as a District Contributor

The two access roads exist largely outside the boundaries of a NRHP-listed historic district, the SRNCHP (DT 66), which was listed in the NRHP in 1996 (and updated in 2010) under Criteria A, B, and C with a period of significance of 1917–1961. The access roads were not previously identified as a component of the Newhalem Creek Powerhouse Site, which was listed in the NRHP as a contributing resource to the SRNCHP (DT 66) in the district's Historic Area D, Single Non-Contiguous Resources. (Erigero 1990:7-4; Johnson 2010:7-82).

This study reconsiders the Newhalem Powerhouse Site as a new historic area within the SRNCHP (DT 66) historic district, the Newhalem Creek Powerhouse Complex, with an expanded period of significance of 1918–1970, beginning with the planning and construction of the NCHP and ending with the year the reconstructed NCHP began producing power. The access roads are not recommended as a contributor to SRNCHP (DT 66) in the newly recommended historic area.

The access roads are not recommended as a contributor to the SRNCHP (DT 66) under Criteria A, B, or C. The access roads do not have significant historic associations with the NCHP's 1918–1921 development and 1967–1970 redevelopment, with J.D. Ross, or engineering significance related to either the 1921 or 1969 designs. Thus, in the absence of significance, regardless of physical condition, the access roads cannot be considered to have integrity that conveys individual significance under Criteria A, B, or C.

Individual NRHP Eligibility

The access roads do not have significant associations under Criteria A, B, C or D as discussed previously. Thus, in the absence of individual significance, regardless of physical condition, the access roads cannot be considered to have integrity that conveys individual significance under Criteria A, B, C, or D. As such, the access roads are recommended not eligible for individual listing in the NRHP under any Criteria.

Physical description:

Dam Access Road's alignment begins at State Route 20, crosses the Skagit River and proceeds south through the Newhalem Campground before turning southwest toward the North Cascades Visitor Center (NCVC). It proceeds southwest past the entrance to the NCVC, climbing the first rise and turning back east toward Newhalem Creek. Though it once extended all the way east to Newhalem Creek and then proceeded south along the creek's western bank, the road is closed to vehicles beginning at a point approximately 0.3 miles northwest of the headworks. Dam Access Road has been paved from State Route 20 to the entrance to the NCVC parking lot. However, its surfacing gradually deteriorates from that point onward, becoming an unmaintained two track-road until the point vehicle access ends. The section of Dam Access Road that continues to the headworks and beyond (south of) along Newhalem Creek has been abandoned and is informally used as a trail to access the backcountry in the upper portions of the drainage. The road was closed to vehicles in 2019 beginning at a point approximately 0.3-mile northwest of the headworks, where a landslide has covered the road. Light vegetative overgrowth obscures the road between this point and the headworks, becoming more heavily overgrown beyond the headworks, obscuring the road completely. However, Dam Access Road south of the headworks was not documented.

Powerhouse Road's alignment begins at Dam Access Road and proceeds east through Newhalem Creek Campground to the Newhalem Creek Bridge, where it crosses Newhalem Creek and continues east to terminate at the powerhouse. Powerhouse Road has been paved with the Newhalem Creek Campground area but is surfaced with gravel east of the easternmost Campground loop.

Considering the condition of its two components, the access roads are in fair condition.

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