

Low Impact Hydropower Institute

Re-certification Application

Lake Chelan Hydroelectric Project  
(FERC No. 637)

Public Utility District No. 1 of  
Chelan County

August 30, 2018

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## Part 1. Facility Description

Information Type	Variable Description	Response (and reference to further details)
<b>Name of the Facility</b>	Facility name and Federal Energy Regulatory Commission (FERC) project number.	The Lake Chelan Hydroelectric Project, FERC Project No. 637.
<b>Location</b>	River name (USGS proper name)	Lake Chelan, Chelan River
	River basin name	Columbia River Basin
	Nearest town, county, and state	Chelan Falls in Chelan County, Washington (powerhouse); and Chelan, in Chelan County, Washington (dam and reservoir).
	River mile of dam above next major river	There are no other dams on Lake Chelan or the Chelan River, though the Chelan River flows into the Columbia River at river mile (RM) 674, approximately 20 miles upstream of the Rocky Reach Hydroelectric Project (FERC No. 2145).
	Geographic latitude	47.8347 latitude
	Geographic longitude	120.0133 longitude
<b>Facility Owner</b>	Application contact names	Suzanne Grassell, Governmental Affairs Program Manager (509) 264-1010 <a href="mailto:Suzanne.grassell@chelanpud.org">Suzanne.grassell@chelanpud.org</a>
	Facility owner (individual and company names)	Public Utility District No. 1 of Chelan County 327 N. Wenatchee Ave. P.O. Box 1231 Wenatchee, WA 98807
	Operating affiliate (if different from owner)	N/A
	Representative in LIHI certification	Suzanne Grassell, Governmental Affairs Program Manager (509) 264-1010 <a href="mailto:Suzanne.grassell@chelanpud.org">Suzanne.grassell@chelanpud.org</a>
<b>Regulatory Status</b>	FERC Project Number, license issuance and expiration dates	Lake Chelan Hydroelectric Project, P-637 Issued November 6, 2006 Expires November 6, 2056 Capacity Addition, Amended February 20, 2009
	FERC license type or special classification (e.g., "qualified conduit")	Major License

	Water Quality Certificate identifier and issuance date, plus source agency name	<ul style="list-style-type: none"> <li>• Issued June 1, 2004. Washington State Department of Ecology Order Number 1233</li> <li>• Amended November 24, 2008. Washington State Department of Ecology Order Number 9389</li> <li>• Amended August 28, 2012. Washington State Department of Ecology Order Number 6215</li> <li>• Amended November 3, 2017. Washington State Department of Ecology Order Number 15481</li> </ul>
	Hyperlinks to key electronic records on FERC e-library website (e.g., most recent Commission Orders, WQC, ESA documents, etc.)	<p><a href="#">License Order, 11-6-2006</a>  <a href="#">Water Quality Certificate 6-1-2004</a>  <a href="#">Pollution Hearings Control Board order upholding Water Quality Certificate 4-21-2004</a>  <a href="#">Amended License Order 2-20-2009; 126 FERC ¶ 62,137</a>  <a href="#">Amended Water Quality Certificate 11-24-2008</a>  <a href="#">Amended Water Quality Certificate 8-28-2012</a>  <a href="#">Amended Water Quality Certificate 11-3-2017</a></p> <p>All of these documents (and more) are available on Chelan PUD's license implementation website: <a href="https://www.chelanpud.org/hydropower/licensing-and-compliance/lake-chelan-license-implementation/license-and-associated-documents">https://www.chelanpud.org/hydropower/licensing-and-compliance/lake-chelan-license-implementation/license-and-associated-documents</a></p>
<b>Power Plant Characteristics</b>	Date of initial operation (past or future for operational applications)	The Lake Chelan Hydroelectric Project received its first federal operating license on May 8, 1926. The first generating unit was placed in commercial operation in September 1927, followed by the second unit 11 months later in August, 1928.
	Total name-plate capacity (MW)	59.2 MW
	Average annual generation (MWh)	412,400 MWh
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	There are two 29.6 MW nameplate turbine generator units. The total hydraulic capacity of the project is 2,600 cfs (or 1,300 cfs for each unit).
	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	Lake Chelan drains easterly to the Columbia River either through releases at the project dam into the 3.9-mile-long Chelan River, or through a diversion at the dam into a 2.2-mile-long power tunnel, which passes water to the powerhouse for generation. The project is typically operated in a seasonal draft and refill manner. The units are

		typically operated near 1,194 cfs, for a combined total of 2,388 cfs.
	Dates and types of major equipment upgrades	FERC amended the Lake Chelan License after Chelan PUD filed an application to replace two existing 24-MW turbine generator units with two new 29.6 MW turbine generator units. Work was completed on the new units in 2009 and 2010, respectively.
	Dates, purpose, and type of any recent operational changes	FERC amended the Lake Chelan license after Chelan PUD filed an application to reduce pumped minimum spawning flow for Steelhead Trout and Chinook salmon from 320 cfs to 260 cfs, on December 7, 2017 and January 23, 2018.
	Plans, authorization, and regulatory activities for any facility upgrades	Automated flow control valve installation at the dam was completed during 2009, in accord with License obligations to provide year-round flow in the Chelan River.
<b>Characteristics of the Dam or Diversion</b>	Date of construction	1926-1928
	Dam height	40 feet structural height; 23 feet hydraulic height.
	Spillway elevation and hydraulic capacity	The dam includes a gated spillway that allows regulation of Lake Chelan between elevations 1,087 and 1,100 feet. Hydraulic capacity of the spillway is 39,100 cfs. Hydraulic capacity of the powerhouse is 2,600 cfs.
	Tailwater elevation	The tailwater (at the dam) elevation is 1070 (USGS). The Chelan powerhouse tailrace is a 1,700-foot-long channel adjacent to the Chelan River Habitat Channel. The tailrace discharges into the Columbia River upstream from the community of Chelan Falls, Washington. The average tailrace water surface elevation is 709.5 ft (USGS).
	Length and type of all penstocks and water conveyance structures between reservoir and powerhouse	The project includes a 14-foot-diameter, 2.2-mile-long power tunnel; a 45-foot-diameter by 125-foot-high steel surge tank; a 90-foot-long penstock that transitions from 14 feet in diameter to 12 feet in diameter before bifurcating to two 90-foot-long, 9-foot-diameter steel penstocks.
	Dates and types of major, generation-related infrastructure improvements	The original generators were rewound in 1951 and 1952. New generators and other equipment were installed in 2009 and 2010.
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	The Project reservoir is operated between a maximum water surface of 1,100 feet and 1,079

		feet to ensure optimum utilization of the reservoir for power generation, fish and wildlife conservation, recreation, water supply and flood control purposes. The reservoir has 677,400 acre-feet of useable storage above elevation 1,079, of which 612,400 acre-feet are used for power generation and 65,000 acre-feet are reserved for irrigation and water supply.
	Water source	Lake Chelan
	Water discharge location or facility	The dam releases a continuous 80 cfs minimum instream flow into the 3.9 mile Chelan River, which discharges into the Columbia River upstream from the community of Chelan Falls, Washington. The powerhouse also discharges into a tailrace adjacent to, but separated from, the Chelan River Habitat Channel.
<b>Reservoir and Watershed</b>	Gross volume and surface area at full pool	Lake Chelan has a maximum surface area of approximately 32,560 acres. Gross storage capacity of the Lake Chelan Project is 15.8 million acre-feet.
	Maximum water surface elevation (ft. MSL)	The maximum water surface elevation is 1,100 feet.
	Maximum and minimum volume and water surface elevations for designated power pool, if available	It has a maximum surface area of approximately 32,560 acres (ac) and contains 677,400 acre-feet (ac-ft) of usable storage between an operating range of a minimum elevation of 1,079 feet and a maximum elevation of 1,100 feet.
	Upstream dam(s) by name, ownership, FERC number (if applicable), and river mile	N/A
	Downstream dam(s) by name, ownership, FERC number (if applicable), and river mile	Rocky Reach Hydroelectric Project (FERC No. 2145) (RM 473.1) and Rock Island Hydroelectric Project (FERC No. 943) (RM 453.7), located on the Columbia River, both owned and operated by Chelan PUD.
	Operating agreements with upstream or downstream reservoirs that affect water availability, if any, and facility operation	N/A
	Area inside FERC project boundary, where appropriate	The Lake Chelan Project boundary extends along the 1,100-foot contour line from the upper end of Lake Chelan near Stehekin, Washington, to the City of Chelan. The Lake Chelan Project boundary continues down both sides of the 3.9 mile Chelan River to the confluence of the Chelan

		and Columbia rivers. Approximately 2,000 acres of land lie within the Lake Chelan Project boundary; 1,300 acres are inundated and the other 700 acres are part of Project facilities. This land is owned by the US Forest Service, National Park Service, several state agencies, Chelan PUD and private property owners. Approximately 465 acres are inundated federal lands.
<b>Hydrologic Setting</b>	Average annual flow at the dam	Average annual inflow to Lake Chelan is approximately 1,496,000 acre-feet (1952-1995, USGS). Inflow in excess of the storage capacity and the hydraulic capacity of the Project generating plant is discharged through the dam spillway.
	Watershed area at the dam	The Project utilizes the waters of the Chelan drainage basin. The drainage basin encompasses approximately 924 square miles, of which approximately 50 percent is above 5,500 feet in elevation. The major portion of precipitation occurring within the watershed falls in the form of snow during the months of November through March. Flows into Lake Chelan are dominated by the springtime, snowmelt runoff, which generally occurs between April 15 and July 15. Historically, the annual peak runoff occurs in early June.
	Average monthly flows	The minimum, mean, and maximum recorded flows for the Chelan River are 0 cfs, 2,060 cfs, and 30,840 cfs, respectively. Chelan PUD has annual and monthly flow duration curves for the project. Monthly flow can range from about 2,000 cfs in September to close to 18,000 cfs in June.
	Location and name of relevant stream gauging stations above and below the facility	Gage USGS 12451000 Stehekin River at Stehekin, Washington, located near the mouth of the Stehekin River; Gage USGS 12451200 at Purple Point at Stehekin, Washington at the head of Lake Chelan; USGS Gage 12452500 near the dam on the Chelan River; and ultrasonic flow meters located in the low level outlet at the dam and in the pump station canal.
<b>Designated Zone of Effects</b>	Number of zones of effect	4
	Upstream and downstream locations by river miles	Zone 1 RM – Lake Chelan Zone 2 RM – Upper Chelan River Zone 3 RM – Lower Chelan River Zone 4 RM - Chelan Project tailrace

	Type of waterbody (river, impoundment, bypassed reach, etc.)	Zone 1 – Lake Zone 2 – Bypassed Reach Zone 3 – Bypassed Reach Zone 4 - Tailrace
	Delimiting structures	Zone 1 – Chelan Dam Zone 2 – Chelan Dam, Chelan River Gorge Zone 3 – Chelan River Habitat Channel, pump station, delivery canal, canal outlet structure Zone 4 - Powerhouse
	Designated uses by state water quality agency	Lake Chelan – Ultra-oligotrophic 4 µg/l or less total Phosphorus Lower Chelan River – salmonid spawning, rearing and migration
<b>Additional Contact Information</b>	Names, addresses, phone numbers, and e-mail for local state and federal resource agencies	Please see Contacts Form.
	Names, addresses, phone numbers, and email for local non-governmental stakeholders	Please see Contacts Form.
<b>Photographs and Maps</b>	Photographs of key features of the facility and each of the designated zones of effect.	See pictures embedded in descriptions of each Zone.
	Maps, aerial photos, and/or plan view diagrams of facility area and river basin.	See pictures embedded in descriptions of each Zone.

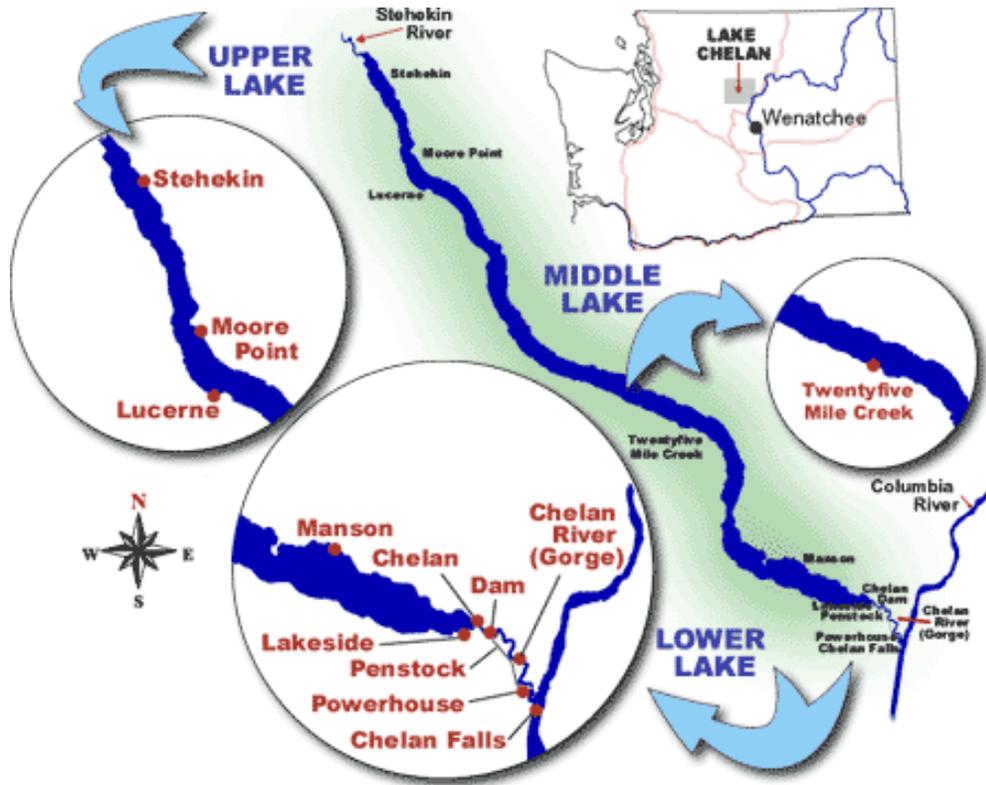
**Project Location**

The Public Utility District No. 1 of Chelan County, Washington, (Chelan PUD) owns and operates the 59.2-MW Lake Chelan Hydroelectric Project (Lake Chelan Project or Project) located on the Chelan River in Chelan County, Washington, approximately 32 miles north of the City of Wenatchee, Washington.

The Lake Chelan Project utilizes the waters of the Lake Chelan drainage basin, which encompasses approximately 924 square miles. The Lake Chelan Project includes a dam and spillway, a 2.2-mile-long tunnel and penstock, and a powerhouse located at the confluence of the Chelan and Columbia rivers.

The Lake Chelan Project lies in a mountain valley on the eastern slope of the Cascade Range in North Central Washington. The Lake Chelan watershed has a drainage area of 924 square miles extending from approximately elevation 9,000 feet at several peaks along the basin divide to elevation 1,100 feet at lake level. The terrain in the basin is rugged with bold topographic relief and prominent landforms that are the result of alpine and continental glaciation.

Picture 1: Project location overview



Lake Chelan is a long and narrow glacial lake situated on the east slope of the Cascade Mountains. From Twentyfive Mile Creek uplake, the terrain is mountainous and rugged. In many cases, the steep slopes run directly into the lake with no flat beaches or shoreline. The terrain of the lower end of the lake is much less severe and mainly arid or semi-arid. The upper end of Lake Chelan is bordered by approximately 50 miles of shoreline in National Forest lands and almost 12 miles of shoreline in National Park lands, more than half of which are designated as a National Recreation Area and Wilderness. The lower end of the lake is primarily in private ownership and a highly popular area for summertime recreation. There are approximately 465.5 acres of the Lake Chelan Project located on federal lands managed by the U.S. Forest Service (USFS) or National Park Service (NPS).

Lake Chelan serves as the reservoir for the Project and is a deep, narrow, natural lake extending northwesterly from the City of Chelan, Washington, 50.4 miles up to the head of the lake near Stehekin, Washington. The maximum width of the lake is 1.8 miles, and there are approximately 118.8 miles of shoreline. The maximum depth of Lake Chelan is 1,486 feet when the lake is at elevation 1,100 feet. Lake Chelan is the third deepest freshwater lake in the United States, behind Crater Lake and Lake Tahoe. It has a maximum surface area of approximately 32,560 acres (ac) and contains 677,400 acre-feet (ac-ft) of usable storage between the Project operating range minimum elevation of 1,079 feet and a normal maximum elevation of 1,100 feet. The full pool water surface elevation is at 1,098 feet. Gross storage capacity of the Lake Chelan Project is 15.8 million acre-feet.

Downstream of the dam, the 3.9-mile-long Chelan River was bypassed by the Lake Chelan Hydroelectric Project until the project was relicensed. A minimum instream flow of 80 cfs now runs through the previously bypassed reach. Part of the river, commonly referred to as the gorge, passes through the glacial moraine and outwash deposits and then a segment of bedrock, dropping about 360.5 feet between the dam and its confluence with the Columbia River.

### ***Dam***

The dam is constructed at the lower or southeasterly end of 55-mile long Lake Chelan where it flows into the Chelan River. The dam is a concrete-gravity, steel-reinforced structure approximately 40 feet high and 490 feet long. Incorporated into the dam are a gated spillway section, a trash sluice and a power tunnel intake structure.

### ***Spillway***

The dam includes a gated spillway that allows regulation of Lake Chelan between elevations 1,087 and 1,100 feet. The spillway section, located in the central portion of the dam, consists of eight, 20-foot-wide-by-14-foot-high tainter gates. The spillway crest is at elevation 1,087, and the tops of the gates are at elevation 1,101. Three gates are operated by 10-horsepower (hp), electrically driven, 7.5-ton-capacity, fixed hoists capable of being operated by either local control, remote control from the powerhouse or remote control from Chelan PUD's dispatch center in Wenatchee. Four of the gates are operated by a manually controlled, self-propelled, rail-mounted gate hoist. The gate hoist is driven by a 10-hp electric motor with reduction gearboxes and two sprocket wheels that are all enclosed within a sheet-metal-bodied mobile unit. The remaining gate is operated locally by a 3.8-hp electric motor with a worm gear box. Two sets of stoplog slots are located upstream of the tainter gates for maintenance.

A 10-foot-wide sluiceway at the left end of the tainter gate spillway bays is fitted with wooden stoplogs, which may be removed to pass logs and other floating debris caught upstream of the dam. The stoplogs are handled with two, 1-ton-capacity, electric-motor-driven chain hoists mounted on a fixed structural steel frame on the spillway bridge.

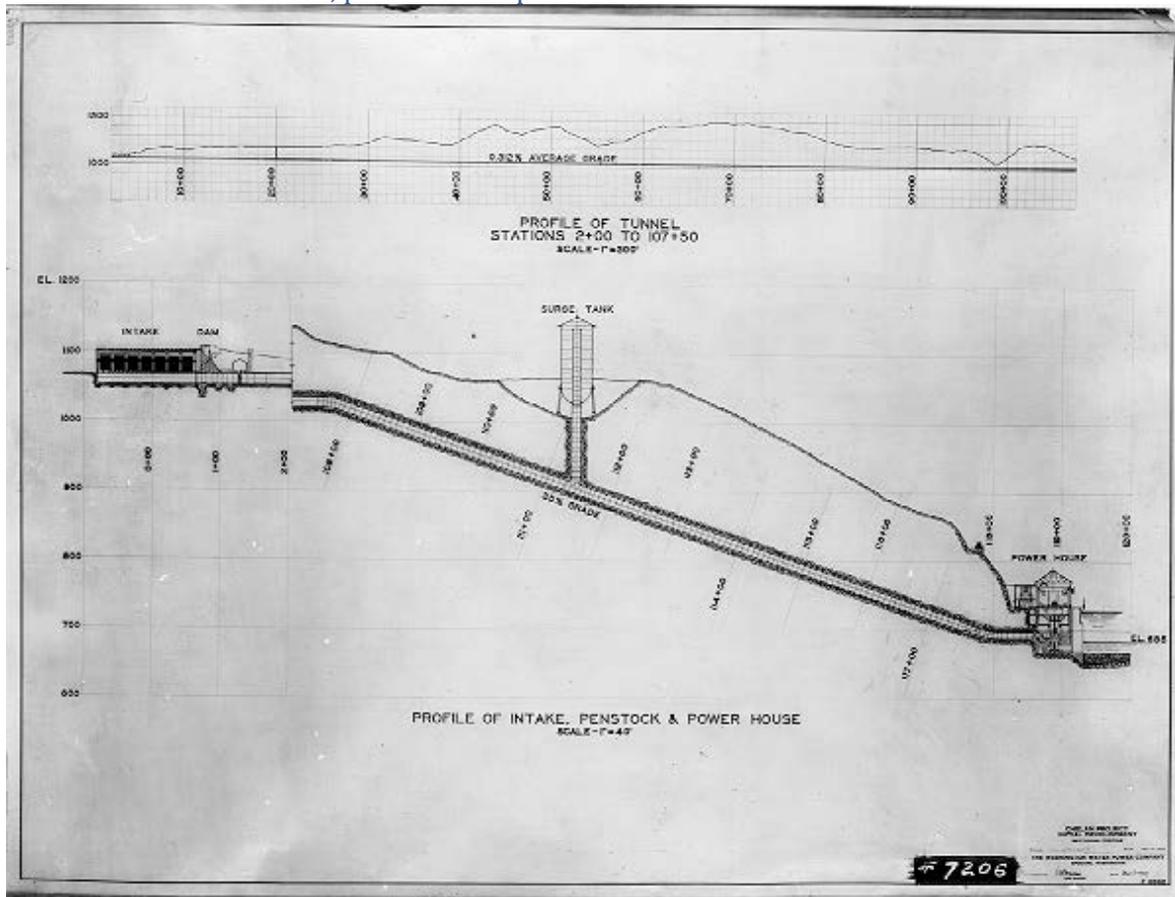
The spillway capacity was reviewed pursuant to Part 12 of the FERC regulations (18 CFR 12.35). The Periodic Safety Inspection Report submitted to the FERC in 1997 found the spillway to have adequate capacity to pass a probable maximum flood (PMF) with a peak inflow to Lake Chelan of 94,800 cubic feet per second (cfs) snowmelt event and a peak outflow of 40,000 cfs. Chelan PUD completed a new probable maximum flood (PMF) determination on Dec. 20, 2001, predicated on a probable maximum rainfall and snow melt event. The spillway is still considered adequate.

### ***Intake***

The horizontal, reinforced-concrete intake structure for the tunnel is located on the west abutment of the dam. The intake structure contains seven, 17-foot-wide inlet openings protected by sectionalized-steel trashracks extending from elevation 1,068 to elevation 1,091. The trashracks are cleaned manually with rakes while the larger debris is floated to the debris removal bay located at the left abutment of the spillway. The intake structure also contains 10,

17-foot-wide inlet openings (without trashracks) for a secondary 17-foot-diameter power tunnel that is stubbed off at the dam axis adjacent to the existing power tunnel inlet. This secondary intake was installed for a future addition of third and fourth units, which have not been added. A 14-foot butterfly valve is located in a valve house at the head of the existing 14-foot-diameter concrete-lined tunnel, which controls the inflow to the tunnel. The valve is used for dewatering the tunnel during inspection and/or maintenance. The butterfly valve is equipped with a 36-inch diameter needle bypass valve and is operated from local controls by an electric-motor driver screw operator. The motor is a high-torque, limited-duty motor rated at 8.4 hp and operates at 750 rpm. A stoplog slot is provided upstream of the butterfly valve at the dam for inspection and/or maintenance of the valve. Stoplogs are stored on the intake structure in a covered open-sided shed.

Picture 2: Profile of intake, penstock and powerhouse



### Water Conveyance

The 14-foot-diameter tunnel is approximately 2.2 miles long and extends from the intake structure at the dam to the powerhouse. The concrete-lined tunnel extends 10,578 feet at a 0.3-percent grade and then joins a steel-lined tunnel and penstock running down a 35-percent grade 1,000 feet to the powerhouse.

A 45-foot-diameter-by-25-foot-high steel surge tank located on the hillside approximately 700 feet from the powerhouse is connected to the lower portion of the lined tunnel by an 11-foot

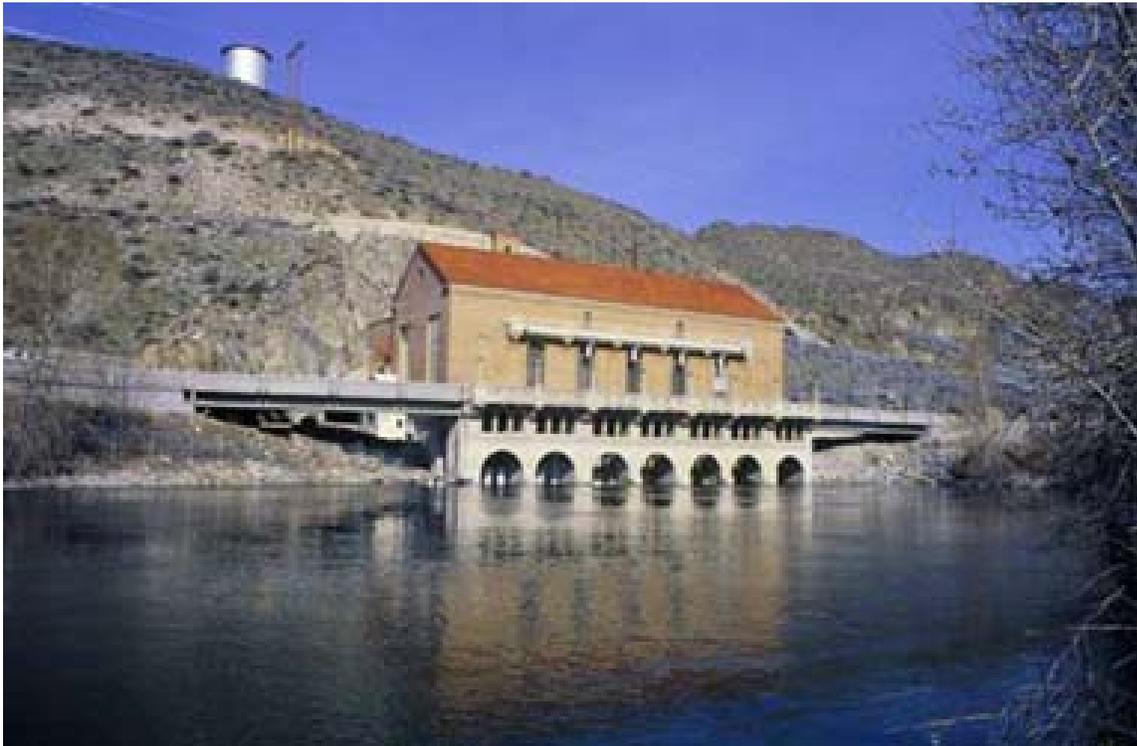
diameter, steel-lined shaft. The capacity of the surge tank is 1,260,000 gallons. The tunnel reduces to 12-foot-diameter and then divides into two, 9-foot-diameter penstock branches leading to 90-inch-diameter butterfly valves before entering the scroll cases of the two turbines.

### ***Powerhouse***

The powerhouse is an indoor type approximately 140 feet long by 100 feet wide and 124 feet high. It houses an erection bay and two vertical-axis turbine generator units. To withstand the higher tailwater levels prevailing after construction of the Rocky Reach Hydroelectric Project (FERC No. 2145) on the Columbia River, the walls of the Chelan powerhouse required minor reinforcing. This was accomplished in 1961 during the construction of the Rocky Reach Hydroelectric Project.

Although the powerhouse includes a control room from which it was originally operated, equipment and facilities for remote control operation were installed in 1972, and operation since that time has been from the Chelan PUD's dispatch center in Wenatchee, Washington.

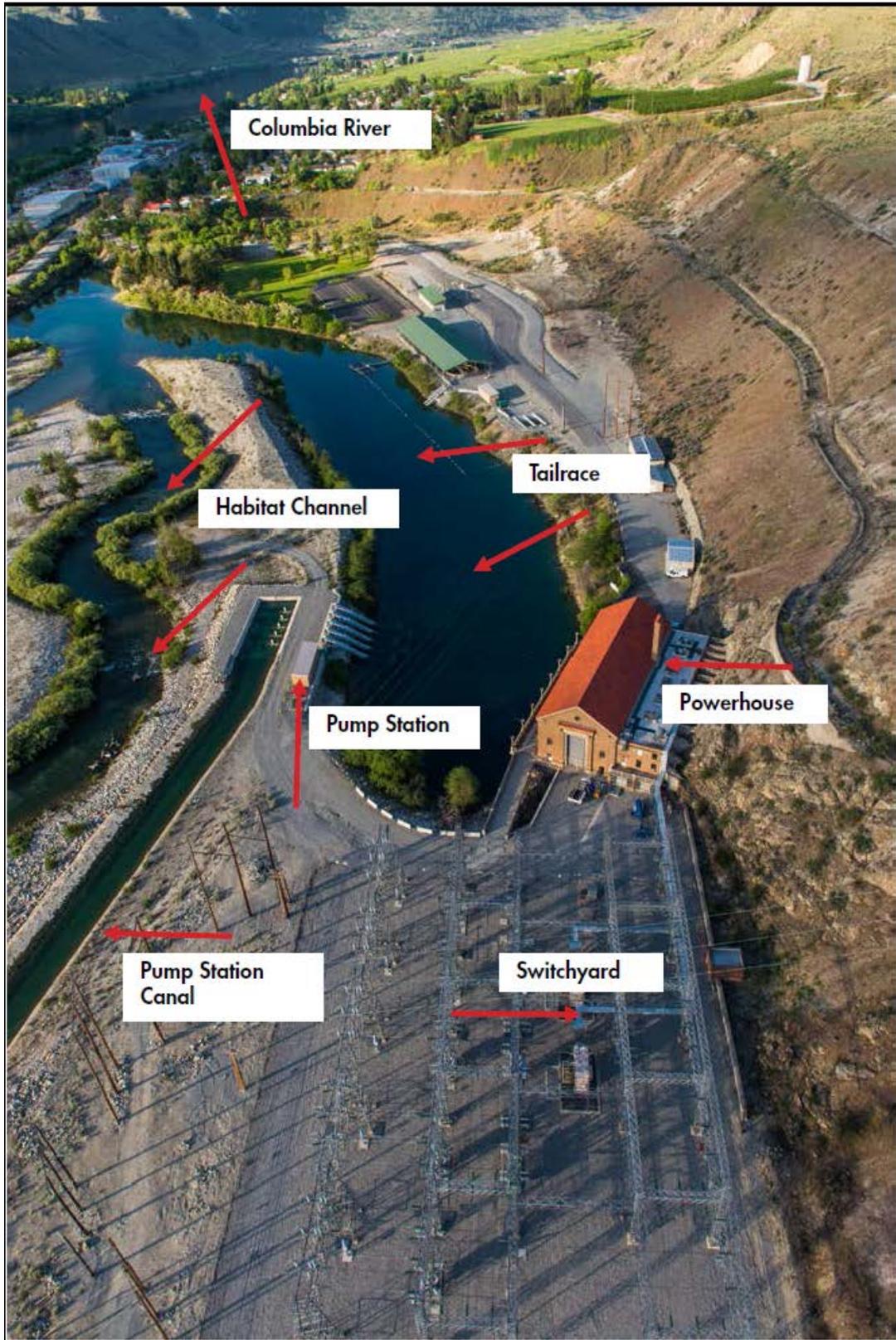
Picture 3: Chelan Powerhouse



### ***Tailrace***

The Chelan powerhouse tailrace is a 1,700-foot-long channel adjacent to the Chelan River channel. The tailrace discharges into the Columbia River upstream from the community of Chelan Falls, Washington.

Picture 4: Chelan tailrace and stream channel



### ***Recreation Facilities***

There are three recreation facilities within the project boundary owned by Chelan PUD. Chelan Riverwalk Park is owned and operated by Chelan PUD. Old Mill Park and Manson Bay Park are owned by Chelan PUD, but operated by the Manson Park and Recreation District. The approximately one-mile long Reach 1 Loop Trail, completed in 2010, connects to Riverwalk Park and provides a scenic opportunity for local people and visitors to explore the Chelan River.

### ***Regulatory Status***

On October 8, 2003, Chelan PUD and participants in the alternative relicensing process for the Project reached final agreement on a comprehensive settlement of all matters addressed in the Lake Chelan relicensing process, including the water quality certification issued by the Washington Department of Ecology (Ecology) under Section 401 of the Clean Water Act. Parties to the Comprehensive Settlement Agreement include the USFS, the NPS, the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS), the Washington State Department of Ecology (WDOE or Ecology), the Washington State Department of Fish and Wildlife (WDFW), the Confederated Tribes of the Colville Reservation, the City of Chelan, and the American Whitewater Affiliation. The Comprehensive Settlement Agreement was incorporated into the license order, which was issued by the Federal Energy Regulatory Commission (FERC) on November 6, 2006. The license was amended in 2009 and the water quality certificate was amended in 2008, 2012, and 2017.

Chelan PUD is implementing a Comprehensive Management Plan (Plan) pursuant to the license and Settlement Agreement. The Plan includes chapters on erosion, Lake Chelan fisheries, Chelan River flows, lake levels, wildlife, historic properties and cultural resources, recreation resources, and conservation measures for upper Columbia River spring-run Chinook and Steelhead Trout. In order to implement the Comprehensive Plans, Chelan PUD and stakeholders engage in adaptive management through ongoing [resource forums](#). These forums are: the Chelan River Fishery Forum; the Lake Chelan Cultural forum; the Lake Chelan Fishery Forum (LCFF); the Lake Chelan Recreation Forum (LCRF); the Lake Chelan Wildlife Forum (LCWF); and the Lake Chelan Policy Committee.

### ***Material Changes Since the Last Certification***

The water quality certificate has been amended twice since Chelan PUD last applied for LIHI certification. The 2004 water quality certificate for the project was issued when the powerhouse had an installed capacity of 48 megawatts and a hydraulic capacity of 2,308 cfs. After the project was modernized with two new turbines in 2009 and 2010, Chelan PUD received a new water quality certificate for the project's expected hydraulic capacity of 2,500. However, subsequent data showed that the project's hydraulic capacity was 2,600 cfs. On August 28, 2012 the WDOE amended the water quality certificate to reflect this change, finding reasonable assurance that the project will comply with state and federal water quality standards and other relevant requirements of state law if operated in accordance with the certificate's conditions. FERC amended the Project license on October 10, 2012 ([141 FERC ¶ 62,026](#)) to reflect this change.

On November 3, 2017, the WDOE further amended the water quality certificate to allow a minimum total spawning flow of 260 cfs instead of a minimum total spawning flow of 320 cfs for Steelhead Trout and Chinook salmon spawning in the Chelan River Habitat Channel. The

Chelan River Fishery Forum, including federal and state agencies, supported implementing lower Chelan River spawning flows to achieve improved spawning habitat for Chinook salmon and Steelhead Trout. FERC amended the Project license on December 7, 2017 ([161 FERC ¶ 62,182](#)) and January 23, 2018 ([162 FERC ¶ 62,052](#)) to reflect this change.

## Part 2. Standards Matrices

For this Low Impact Hydro certification application, the Project area has been divided into four distinct Zones of Effect (Zones). Zone 1 is Lake Chelan; Zone 2 is Reaches 1 -3 of the Chelan River; Zone 3 is the lower Chelan River (including the Chelan River Habitat Channel, spill overflow channel, and pump station and delivery canal), which is referred to as Reach 4 throughout this document; and Zone 4 is the Project powerhouse and tailrace. Each of these is addressed in the following sections.

### 2.1 Zone of Effect 1 – Lake Chelan

The standards applicable to each criterion for Zone 1 are summarized in Table 1 and described below. Resource agency recommendations for the project are incorporated into the [Comprehensive Settlement Agreement](#) for the Project, signed on October 8, 2003 and incorporated into a new [license for the Project](#) on November 6, 2006. The water quality certificate for the project was issued June 1, 2004 ([Order number 1233](#)) and amended on the following dates: [Order Number 6215](#) – amended November 24, 2008; [Order Number 9389](#) - amended August 28, 2012; and [Order Number 15481](#) - amended November 3, 2017. There has not been a FERC Environmental Inspection Report issued since 2012.

Table 1 – Zone of Effect 1

Criterion	Standards Applied	Standards Applied				
		1	2	3	4	Plus
A	Ecological Flow Regimes	x				
B	Water Quality	x				
C	Upstream Fish Passage		x			
D	Downstream Fish Passage		x			
E	Watershed and Shoreline Protection		x			
F	Threatened and Endangered	x				

	Species Protection					
G	Cultural and Historic Resources Protection		x			
H	Recreational Resources		x			

Picture 5. View of Lake Chelan, Chelan Dam and upper portion of Chelan River



2.1.1. Ecological Flow Standards

Criterion	Standard	Instructions
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A	1	<p>Not Applicable / De Minimis Effect:</p> <ul style="list-style-type: none"> <li>• Confirm the location of the powerhouse relative to other dam/diversion structures to establish that there are no bypassed reaches at the facility.</li> <li>• If Run-of-River operation, provide details on how flows, water levels, and operation are monitored to ensure such an operational mode is maintained.</li> <li>• In a conduit project, identify the water source and discharge points for the conduit system within which the hydropower plant is located.</li> <li>• For impoundment zones only, explain how fish and wildlife habitat within the zone is evaluated and managed –</li> </ul> <p><b>NOTE:</b> this is required information, but it will not be used to determine whether the Ecological Flows criterion has been satisfied. All impoundment zones can apply Criterion A-1 to pass this criterion.</p>
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The timing and volume of snowmelt inflow to Lake Chelan is highly variable from year to year, dependent on both the annual snowfall and the weather in spring and early summer. The operation of the Project has been managed to meet license conditions regarding the timing of refill since the Project began operation. Today, snow surveys and remote sensors gauge the accumulation of snow and water content in the drainage on a monthly basis, with the most accurate forecast becoming available in April.

Chelan PUD has accumulated over 70 years of records, and has developed statistical curves for accumulated inflow during early, average, and late runoff conditions. These curves provide a predictive tool for inflow volumes and lake refill timing, based on the April runoff forecast. Chelan PUD uses these predictive curves to manage power generation to avoid drafting more water from the lake than can be replaced by snowmelt inflow. Refilling the lake on time takes precedence over power generation. Warm weather usually arrives in June, and the lake refills before June 30 most of the time.

Under its license, Chelan PUD manages the elevation of Lake Chelan from October 1 through May 1 based on monitoring of snowpack water content, lake level, and projected precipitation and runoff timing. Monthly target elevations May through October for Lake Chelan are managed by Chelan PUD with the following objectives in mind:

1. Maintaining minimum flows in the Chelan River (this objective has priority over lake levels);
2. Reducing high flows in the Chelan River (this objective has priority over lake levels);
3. Satisfying regulatory requirements for flood control (adjusting lake level);
4. Providing usable lake levels for recreation (which varies between elevation 1,090 and 1,098 ft depending on the slope of the shoreline and boat dock configurations);
5. Reducing shoreline erosion;
6. Preventing fish passage blockages (due to tributary barriers);
7. Minimizing the effect of refill on attainment of flow objectives for salmon in the mainstem Columbia River.

Chelan PUD makes every reasonable effort to operate the Project to meet the above objectives. Additionally, Chelan PUD operates the Project, to the extent practicable, to obtain elevations by the dates specified (within reasonable predictive probability):

**Minimum Elevation (ft)**

May 1	1,087.6
June 1	1,094.0
July 1	1,098.0
August 1	1,099.0
September 7	1,098.7
October 1	1,097.2

In the spring (May 1 through June 30), average lake levels (shown below) will be higher in those years in which the timing of the runoff is early to average. These higher lake level elevations earlier in the year will help make recreational facilities more usable. Examples of the benefit of higher, earlier lake elevations are: 1) a lake elevation of 1,098 ft level is needed to make all fixed docks usable; 2) public marinas, such as Don Morse Park and Twenty-five Mile Creek State Park, need an elevation of 1,094 ft for boat slips to be usable, and 1,091 ft for the boat launch to be usable; and 3) most private marinas need a minimum elevation of 1,091 ft to be 25-35 percent usable. During early to average runoff conditions in early May 1, a lake elevation of 1,090 ft or above is likely.

In the fall (Sept. 1 to Nov. 1), the average lake elevations shown below are maintained to reduce erosion and to prevent barriers from forming at tributary mouths. In October, average elevations may be higher due to conservative Project operation and occasional fall rain events. Operation in accordance with the conditions and minimum elevations described above is expected to result in the following average elevations and lake levels:

**Average Lake Levels (ft)**

January 1	1,089.2
February 1	1,087.1
March 1	1,085.7
April 1 3	1,085.4
May 1	1,087.8
June 1	1,095.2
July 1	1,099.3
August 1	1,099.7
September 1	1,098.92
October 1	1,097.4
November 1	1,094.3
December 1	1,091.8

Chelan PUD has a good record of achieving lake level objectives. The last [deviation](#) was reported to FERC in 2011.

### ***Lake Level Operation – Late and High Runoff Conditions***

Lake refill in the spring is affected by both the volume and timing of runoff. As part of the license for the Lake Chelan Project, Chelan PUD is required to provide minimum instream flows to the Chelan River. Another requirement is to minimize high flows (greater than 6,000 cfs) in the Chelan River bypassed reach to protect modified habitat measures to be implemented at the lower end of the Chelan River to enhance anadromous fish production.

### ***Late Runoff Conditions***

The February 1, March 1, and April 1 runoff volume forecasts and the lake level elevation are used to establish the level of releases for April, May, and June. The volume of runoff needed to refill the lake is calculated from the lake elevation. The proportion of the runoff volume forecasts expected to occur prior to May 1, June 1, and July 1 is estimated, and the volume in excess of the refill requirement is used for power generation. Three predictive curves, one each for early, average, and late runoff timing, are generated based on the forecast. These curves are then used to manage generation. On average, approximately 81 percent of the runoff entering the lake occurs before July 1 (average runoff). In years with cold spring weather, approximately 71 percent of the runoff occurs by July 1 (late runoff), whereas in warm years, as much as 87 percent occurs by July 1 (early runoff). For purposes of lake level management, early runoff is defined as a year in which at least 80 percent of the predicted runoff occurs before July 1, and late runoff is defined as a year in which less than 80 percent of the predicted runoff occurs before July 1.

In most years, the cold spring weather breaks by early June and the lake refills before July 1, which results in substantial levels of spill. The approach in the license assumes early to average runoff conditions, also defined as operating to 80 percent probability of refill by June 30, and includes minimum flow releases into the Chelan River. This level of flexibility helps reduce spill levels and provides: 1) reduced impacts on aquatic biota in the bypassed reach of the Chelan River from high peak spill level; 2) benefits to aquatic biota by providing conditions in the previously bypassed reach of the Chelan River that more closely mimic the natural hydrograph; 3) more flow in the tailrace in early spring (April and May) for Steelhead Trout egg incubation and fry emergence; and 4) reduce impacts on power generation.

### ***Proposed Operating Regime - High Runoff Conditions (PMF)***

FERC regulations require the Project to be able to pass the outflow from the probable maximum flood (PMF) without failure of the dam. From October through mid-November, the Project's PMF is based on a maximum probable precipitation event in the watershed, but does not include significant amounts of snow in place. From late November through February, the PMF would be produced by maximum probable precipitation falling on an unusually large (100-year) snowpack. To maintain the ability to pass the PMF without dam failure, the Project must be operated in a way that provides enough storage to capture part of the PMF inflows. The amount of available storage required varies with the water content of the snow present in the watershed. The effect of this requirement is that the lake must be kept at lower levels when larger snowpack exists in the watershed. The lake is drawn down through the winter to accommodate the amount of runoff anticipated the next spring.

Fish and wildlife habitat within the zone is managed pursuant to the license and Comprehensive Settlement Agreement, in particular the [Lake Chelan Comprehensive Fishery Management Plan](#) (CFMP) and the [Wildlife Habitat Plan](#) (WHP).

The CFMP is designed to 1) provide guidance for the management of the fishery resources in Lake Chelan; 2) maintain a healthy recreational sport fishery in Lake Chelan; 3) and develop a monitoring and evaluation program to assess the efficacy of management actions.

Funds allocated under the WHP are expended on resources that are most valuable to wildlife and most compatible with wildlife land use in Chelan County. Those lands will include key habitat types, migration corridors, and shrub steppe, grassland, and riparian/wetland habitats that offer restoration or improvement opportunities.

### 2.1.2. Water Quality

Criterion	Standard	Instructions
B	1	Not Applicable / De Minimis Effect: <ul style="list-style-type: none"> <li>• If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation.</li> <li>• Explain rationale for why facility does not alter water quality characteristics below, around, and above the facility.</li> </ul>

The water quality of Lake Chelan is nearly pristine, with few identified water quality limitations. Limited watershed inputs of the critical nutrient, phosphorus, controls the growth of algae in the lake, and maintains its exceptional water clarity. Overall, the water quality of Lake Chelan is characterized as ultra-oligotrophic (unproductive), and is considered one of the most pristine waterbodies in North America. Localized water quality degradation occurs near irrigation return flow drainage outfalls near population centers, but the majority of nutrient and bacterial inputs to Lake Chelan that could result in at least localized water quality effects are attributed to non-point sources. See more about Lake Chelan water quality in the Final Environmental Assessment.<sup>1</sup>

Although lake level is statistically correlated with fecal coliform levels, this is likely an artifact of seasonal differences in waterfowl abundance, recreation use and irrigation return flow that coincide with lake level fluctuations. Resource agencies and Chelan PUD proposed the described lake level management plan, and the FERC found that it would not likely affect water quality in Lake Chelan. In addition, Chelan PUD does not implement any specific enhancement measures to address water quality in Lake Chelan, although erosion control projects carried out by Chelan PUD pursuant to its license may improve water quality conditions by causing localized reductions in turbidity and suspended solids at the sites where erosion mitigation would be implemented. The latest Integrated Water Quality Monitoring and Assessment Report for Washington State is available [here](#).

<sup>1</sup> Final environmental Assessment for Hydropower License, Lake Chelan Hydroelectric Project, FERC Project No. 637. [http://clio.chelanpud.org/relicense/study/reports/3796\\_2.pdf](http://clio.chelanpud.org/relicense/study/reports/3796_2.pdf)

Chelan PUD is on a 10-year compliance schedule to evaluate and monitor the beneficial uses of the Chelan River based on the biological objectives established in the water quality certificate and license. After 10 years of license implementation, Chelan PUD is required to provide WDOE with the information necessary to make a determination on whether the biological objectives in the CRBEIP and the state water quality standards have been achieved. If WDOE determines that the biological objectives have been met but non-compliance with water quality standards exists, WDOE intends that it will initiate a process to modify the applicable standards through rulemaking or such alternative process as may otherwise be authorized under applicable state and federal law. The compliance schedule deadline is December 31, 2019. The license measures necessary to begin implementation of the water quality measures were not in place until 2009. See correspondence with FERC regarding a Request for Time Extension – Minimum Flows in Chelan River and Reach 4 Stream Channel Improvements, including the [FERC order revising the Article 408 schedule](#); [Chelan PUD’s revised schedule](#); [FERC’s order granting extension of time under Article 408](#); and [Chelan PUD’s request for a time extension](#).

The following is an excerpt from Chapter 7 of Attachment B of the Lake Chelan Comprehensive Settlement Agreement:

“Lake Chelan is an ultra-oligotrophic lake characterized as nearly pristine, with few identified water quality limitations. In order to maintain this high-level water quality, Lake Chelan has a Total Maximum Daily Load (TMDL) for phosphorus, the primary nutrient limiting factor for algal growth. Other water quality concerns previously noted in earlier studies included localized water quality effects attributed to non-point sources of bacterial input and pesticides. Information collected during monitoring of Lake Chelan in 1999 suggests that water quality conditions in the lake have been very stable since baseline monitoring began in 1987. Phosphorus loading into the Wapato Basin “appears to have remained fairly constant between 1987 and 1999” (Anchor Environmental 2000). The report also indicated that lake level fluctuations resulting from current Chelan PUD operations appear “unlikely to have a direct or indirect effect on TP or fecal coliform levels in Lake Chelan” (Anchor Environmental 2000).

Early in the relicensing process, the NSWG approved a plan for the study of baseline water quality conditions in Lake Chelan, the Chelan River, and the Project tailrace. The intent of the study, conducted in 1999, was to evaluate the Project’s effects on water quality parameters in the watershed. The parameters measured in this study were compared to baseline studies conducted in 1987 (Patmont et al. 1989), and follow-up investigations (Congdon 1996; Sergeant 1997). In 2000, Anchor Environmental presented its findings in a report to the NSWG. The study found that water quality parameters in Lake Chelan are within Washington State water quality standards, and are not adversely affected by operation of the Project.”

Water quality is a major focus for Zones 2 and 3.

### 2.1.3 Upstream Fish Passage

Criterion	Standard	Instructions
C	2	Agency Recommendation:

		<ul style="list-style-type: none"> <li>• Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent).</li> <li>• Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.</li> <li>• Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.</li> </ul>
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Pursuant to the license and Settlement Agreement, under the [Lake Chelan Comprehensive Fishery Management Plan](#) (CFMP), Chelan PUD is required to make available \$100,000 for developing a Food Web Model; provide annual funding of \$20,000 for monitoring and evaluation; and make available an additional \$20,000 per year, for matching funding for monitoring and evaluation. In consultation with the resource agencies, Chelan PUD agreed to conduct mechanical excavation of existing tributary barriers in up to 10 high priority tributaries over the first five years of the new license; monitor of up to 10 tributaries with existing barriers to determine if the new lake level operating regime is sufficient to naturally remove existing barriers; monitor up to 10 selected tributaries, with modified barrier analysis methodology to determine if barriers are present or have reformed; and treat up to two tributaries within the drawdown zone annually to remove barriers for the life of the license.

Chelan PUD has removed alluvial barriers at the mouths of tributaries to Lake Chelan in order to facilitate spawning access for adfluvial salmonid, specifically the potomodromous species Westslope Cutthroat Trout. Barriers to upstream fish passage were identified in seven of nine major tributaries entering Lake Chelan during relicensing studies (Chelan PUD 2000). Creation of one or all of either depth, water velocity, or gradient barriers at these tributary mouths was attributed to Project operations. In coordination with the Lake Chelan Fishery Forum, Chelan PUD develops work plans to remove existing tributary barriers as needed. Mechanical barrier removal and stream reconstruction activities were conducted in Mitchell and Gold creeks, simultaneously, beginning the week of February 7, 2011 and completed on February 24, 2011. No further mechanical treatment is planned for any Lake Chelan tributary at this time. Lake operations included in the existing license for the project have allowed storm and large flow events to scour through gravel deposits and remove barriers to upstream fish passage in the remaining five tributaries where barriers were identified previously. Monitoring will continue in future years to document passage ability for trout between elevations 1086 ft. and 1100 ft. No barriers to upstream fish passage have been observed since 2011 during annual monitoring surveys. Chelan PUD and the LCCF continue to monitor tributaries to determine whether barriers are present or have reformed.

Monitoring reports and other compliance information related to the CFMP can be found [here](#) under License Article 404.

A food-web model was developed by the University of Washington for assisting fisheries managers to prioritize the conservation and restoration of native species, specifically Westslope Cutthroat Trout, while maintaining healthy recreational fisheries in Lake Chelan (Schoen and Beauchamp 2007; Schoen and Beauchamp 2010). The goal of the food-web model was to provide guidance to managers by identifying the major predators of salmonids in the lake, quantifying spatial, seasonal, and size-structured patterns of predation, and describing trends in lake trout harvest and population dynamics. Results of the food-web model investigation can be found [here](#).

#### 2.1.4 Downstream Fish Passage

Criterion	Standard	Instructions
D	2	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent).</li> <li>• Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is part of a Settlement Agreement or not.</li> <li>• Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.</li> </ul>

Pursuant to the license and Settlement Agreement, under the [Lake Chelan Comprehensive Fishery Management Plan](#), Chelan PUD is required to conduct entrainment sampling to determine the potential for entrainment of adult Westslope Cutthroat Trout at the project intakes. In coordination with the Lake Chelan Fishery Forum (LCFF), and discussed in section 2.8 of the [2017 Lake Chelan Fishery Forum Annual Work Plan](#), the entrainment study has not been implemented yet due to the low numbers of Westslope Cutthroat Trout documented in the project area. Less than 120 westslope cutthroat trout and rainbow trout (combined) were observed in the entire length of Reach 1 of the Chelan River during the October 2016 snorkel survey. This indicates that a low number of trout are likely near the dam during spill operations, and, therefore, a low number of fish are likely in the vicinity of the power tunnel intake with the potential to become entrained.

Currently, there is no schedule for conducting an entrainment investigation at the Lake Chelan Dam. The LCFF did not support conducting an investigation in either 2017 or 2018 due to observed low numbers of the target species, Westslope Cutthroat Trout, in the vicinity of the power tunnel intake. See: [Lake Chelan Fishery Forum 2018 Annual Work Plan, section 2.8 Entrainment Investigation](#). The LCFF did support developing a study plan for Forum review and subsequent approval by FERC so it would be ready when the Forum does support conducting an investigation, likely in the near future. The schedule for an entrainment investigation will be developed at future Forum meetings.

Monitoring reports and other compliance information related to the CFMP can be found [here](#) under License Article 404.

*2.1.5 Watershed and Shoreline Protection*

Criterion	Standard	Instructions
E	2	Agency Recommendation: <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Chelan PUD does not control much of the activities on the shoreline because the NPS owns and manages about 10 miles of shoreline; the USFS owns and manages about 30 miles of shoreline, the Confederated Tribes of the Colville Reservation has allotments at Wapato Point; Washington State owns and manages two parks along the shoreline, the cities of Manson and Chelan own and manage shoreline property; and there are numerous private holdings along the shoreline.

However, Chelan PUD does address erosion associated with fluctuating lake levels by monitoring erosion on USFS lands; coordinating, funding and monitoring erosion control measures at seven sites on Park Service land; coordinating and funding the transport of large woody debris to be used for bank protection/stabilization; and coordinating and funding Park Service efforts to control dust and to monitor dust abatement measures at the mouth of the Stehekin River. Chelan PUD also provided engineering and design services to help control erosion at Don Morse Park beach area and marina breakwater on Lake Chelan.

The [Lake Chelan Erosion Control Plan](#), [Lake Chelan Large Woody Debris Management Plan](#), and [Stehekin Area Implementation Plan](#) all address various aspects of shoreline management and erosion control. No large woody debris management or collection activities have occurred since 2012. Chelan PUD is required to “make available” to WDFW “\$5,000 per year for each of the first 20 years of the New License.” WDFW staff participating in the LCFF has not chosen to exercise use of any available funding to date. The total accrued amount to date is \$126,874.90.

Monitoring reports and other compliance information related to these plans can be found [here](#) under Settlement Agreement Articles 1 and 2.

*2.1.6 Threatened and Endangered Species Protection*

Criterion	Standard	Instructions
F	1	Not Applicable / De Minimis Effect: <ul style="list-style-type: none"> <li>• Document that there are no listed species in the facility area or affected riverine zones downstream of the facility.</li> <li>• If listed species are known to have existed in the facility area in the past but are not currently present, explain why</li> </ul>

		<p>the facility was not the cause of the extirpation of such species.</p> <ul style="list-style-type: none"> <li>• If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.</li> </ul>
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There are no endangered or threatened species present in Zone 1. Bull trout, listed as threatened under the Endangered Species Act (ESA), are one of two native salmonids to Lake Chelan (the other being Westslope Cutthroat Trout). Bull trout have not been observed in Lake Chelan since the late 1940s, and have been determined to be extirpated from the basin by the USFWS and NPS. However, bull trout critical habitat has been designated in Lake Chelan uplake from Twenty-Five Mile Creek. Hence, any development above Twenty-five Mile Creek requires ESA consultation and the acquisition of appropriate permits prior to construction.

The basis of the USFWS’s determination that bull trout have been extirpated from the Lake Chelan Basin, both Lake Chelan and Chelan River, is the report *What happened to bull trout in Lake Chelan? An examination of the historical evidence* (Nelson 2012). The report documents the last verified bull trout observations that occurred on July 16, 1957 when two “Dolly Varden” were caught in the Stehekin River, preserved, and sent to the Oregon State University Museum. Bull trout were called Dolly Varden commonly until they were identified in 1978 as two distinct species. These two specimens were confirmed as bull trout in analysis by Haas and McPhail (1991) that showed only bull trout are present in the Columbia River Basin.

Since 1957, numerous surveys have failed to locate any bull trout in the basin (Brown 1984; DES 2001; Archibald 2002; Halupka et al. 2002; Kelly-Ringel 2004; LCFF 2017). Although the reason for bull trout disappearance from the Lake Chelan Basin is not known, several hypotheses have been suggested with flooding of spawning grounds, an introduced pathogen, and subsequent over-fishing being the most commonly cited (Leman 1969; Buckner and Campbell 1977; Brown 1984; WDFW 2002). Nowhere in Nelson (2012) is operation of the Lake Chelan Hydroelectric Project identified as a potential causative agent for the extirpation of Bull Trout in the Lake Chelan Basin.

A barrier analysis study conducted for the Chelan River concluded that five natural barriers would be impassible to Steelhead Trout and other anadromous salmonid species at all flows. Based on these results and the lack of historic evidence indicating the presence of anadromous fish in Lake Chelan, the Chelan River is only suitable for anadromous fish in Zone 3. See the [Chelan River Biological Evaluation and Implementation Plan](#) (CRBEIP) and the final [Tributary Barrier Analysis](#).

#### 2.1.7. Cultural and Historic Resources Protection

Criterion	Standard	Instructions
G	2	<p>Approved Plan:</p> <ul style="list-style-type: none"> <li>• Provide documentation of all approved state, provincial, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility.</li> </ul>

		<ul style="list-style-type: none"> <li>• Document that the facility is in compliance with all such plans.</li> </ul>
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To protect cultural resources, Chelan PUD is implementing a Historic Properties Management Plan and programmatic agreement with the Commission, the State Historic Preservation Officer, and the Confederated Tribes of the Colville Reservation Tribal Historic Preservation Officer. As part of relicensing the project, Chelan PUD conducted historic-era cultural resource and traditional cultural properties studies.

Archaeological surveys have identified 125 sites, including 39 pre-contact sites and 86 historic-era sites within the area potentially affected by the project. Campsites or village locations are the most numerous pre-contact sites, with lithic scatters also common. Historic-era site categories include hotels or lodges, structures or structural remains, homesteads, debris or dumpsites, irrigation features, logging-related features, transportation features, built-property features, and mine adits. Transportation features are the most numerous historic era site type.

Potential Project effects that may harm cultural resources include erosion of the Lake Chelan shoreline due to fluctuating lake levels. Such fluctuation in lake level may expose buried cultural resources, impair data recovery, or may impact native species or natural environments that have traditional value to the tribes. Vandalism can occur wherever public visitation is permitted, and is encouraged without regular surveillance.

Chelan PUD implements measures to minimize vandalism of known cultural resources at Chelan PUD-owned recreational facilities or in areas of vandalism caused by project operations. Chelan PUD also implements measures to address effects of construction of new roads or major improvements to existing roads on cultural resources.

Chelan PUD consults with the Lake Chelan Cultural Forum established under the license to develop treatment plans for historic properties. These include protection of the resource from Project effects, if practical measures exist to prevent Project effects from occurring. Where Chelan PUD cannot assure complete protection, then actions are taken to limit Project effects or address adverse effects through data recovery or other measures. Chelan PUD considers agency and Tribal recommendations when considering data recovery measures, and when addressing adverse effects on traditional cultural properties.

The Lake Chelan Historic Properties Management Plan is part of the Comprehensive Settlement Agreement. Monitoring reports and other compliance information related to the HPCRMP can be found [here](#) under License Article 410 and Settlement Agreement Article 10.

#### 2.1.8 Recreational Resources

Criterion	Standard	Instructions
H	2	Agency Recommendation: <ul style="list-style-type: none"> <li>• Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations.</li> </ul>

		• Document that the facility is in compliance with all such recommendations and plans.
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Boating is an important recreational activity on Lake Chelan. Pursuant to the license and Settlement Agreement, under the [Lake Level Management](#) plan, Chelan PUD strikes a balance between raising average lake elevations earlier in the spring to promote tourism and recreation and lowering lake elevations earlier in the fall to improve fish habitat and reduce shoreline erosion. Chelan PUD operates the Project to obtain minimum elevations by the dates specified (within reasonable predictive probability):

**Minimum Elevation (ft)**

May 1	1,087.6
June 1	1,094.0
July 1	1,098.0
August 1	1,099.0
September 7	1,098.7
October 1	1,097.2

These levels enhance the recreational “shoulder” seasons by enabling recreational boaters to access docks for a longer period of time.

In addition, as required by the license, Chelan PUD provides a specific amount of funding to federal agencies for the purpose of repairing, expanding, operating and maintaining and replacing USFS and NPS docks on Lake Chelan. In 2003 dollars, this includes \$800,000 for the repair, replacement and engineering associated with USFS docks, plus \$39,000 for dock operations and maintenance. It also includes \$149,000 for the repair, replacement and maintenance of NPS docks and \$871,000 to stabilize NPS recreation sites.

Chelan PUD also provides specific funding to the USFS and NPS for recreational enhancements within or adjacent to the Lake Chelan basin for USFS and NPS recreation sites. For the USFS, this includes \$1,320,000 for recreational enhancements, plus annual funding of \$6,000 for the operations and maintenance of such sites in the Lake Chelan Basin. For the NPS, this includes \$130,000 for recreational enhancements associated with NPS sites in the Project Area.

This funding is available for the agencies to use, but Chelan PUD maintains the funding in a liability account until the agencies perform and invoice for the work. The actual amount paid out each year varies based on the capacity of the agencies and the scope of work performed.

To enhance the lake fishery, Chelan PUD funded WDFW efforts to rear and stock 5,000 pounds of salmonid fingerlings, currently a combination of kokanee and Westslope cutthroat Trout, and 33,000 pounds of catchable-size salmonids, currently all Westslope cutthroat Trout, in Lake Chelan. To satisfy our license requirements, Chelan PUD pays WDFW to raise and stock these fish from the Chelan Hatchery at a cost of approximately \$30,000 annually.

Chelan PUD owns three parks on Lake Chelan: Riverwalk, Old Mill, and Manson Bay. Under the new license, Chelan PUD will continue to own and operate Riverwalk Park, and Chelan River Loop Trail. Chelan PUD owns and oversees operation and maintenance agreements with

Manson Parks Recreation District for Old Mill Park and Manson Bay Park. Chelan PUD also funded a micro-park providing lake access near downtown Chelan that is operated by the City of Chelan.

The [Lake Chelan Hydroelectric Project Recreation Resources Management Plan](#) (RRMP) is part of the Comprehensive Settlement Agreement for the Project. Compliance information related to the RRMP can be found [here](#) under License Article 407 and Settlement Article 11.

## 2.2 Zone of Effect 2 – Reaches 1, 2, and 3 of the Chelan River

The Chelan River extends from the dam downstream to the Columbia River for approximately 3.9 miles. The Chelan River can be divided into four reaches based upon gradient, confinement, and fluvial geomorphologic characteristics. Reach 1 is the upper-most section from the diversion of the dam, downstream for 2.29 miles. Reach 2 is a 0.75 mile-long section located in the upper end of the Chelan River Gorge. Reach 3 is the gorge section of the Chelan River, 0.38 miles in length.

Resource agency recommendations for the project are incorporated into the [Comprehensive Settlement Agreement](#) for the Project, signed on October 8, 2003 and incorporated into a new [license for the Project](#) on November 6, 2006. The water quality certificate for the project was issued June 1, 2004 ([Order number 1233](#)) and amended on the following dates: [Order Number 6215](#) – amended November 24, 2008; [Order Number 9389](#) - amended August 28, 2012; and [Order Number 15481](#) - amended November 3, 2017. There has not been a FERC Environmental Inspection Report issued since 2012.

The standards applicable to each criterion for Zone 2 are summarized in Table 1 and described below.

Table 2 – Zone of Effect 2

Criterion	Standards Applied	Standards Applied				
		1	2	3	4	Plus
A	Ecological Flow Regimes		x			
B	Water Quality		x			
C	Upstream Fish Passage		x			
D	Downstream Fish Passage	x				
E	Watershed and Shoreline Protection		x			

F	Threatened and Endangered Species Protection	x				
G	Cultural and Historic Resources Protection		x			
H	Recreational Resources		x			

Picture 6: Dam Spill and Chelan River



2.2.1. Ecological Flow Standards

Criterion	Standard	Instructions
A	2	Agency Recommendation (see Appendix A for definitions): <ul style="list-style-type: none"> <li>• Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent).</li> <li>• Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> </ul>

		<ul style="list-style-type: none"> <li>• Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow</li> </ul>
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Prior to the current license, the Project was not required to provide a minimum flow to the Chelan River. A primary objective of Washington State Department of Ecology (Ecology) during the relicensing process was to establish a minimum instream flow for the Chelan River in order to re-establish a functional aquatic ecosystem. The typical instream flow-setting methodology, the Instream Flow Incremental Methodology (IFM), was used to develop information used to negotiate the current minimum instream flow level of 80 cfs for the Chelan River.

Cross-sections and transects were established in Reaches 1 and 4 of the Chelan River. Under three flow levels, measurements of water depth, water velocity, and substrate size data were recorded along each transect. Data were entered into the PHABSIM model, which produced habitat amounts, or Weighted Useable Area (WUA), for different fish species and various life stages. WUA curves were generated by the model identifying the potential amount of available habitat for each fish species, life stage, and flow level. From these data, the relicensing Natural Sciences Work Group (NSWG) negotiated the current minimum instream flow level of 80 cfs. The NSWG was comprised of state and federal fishery management agencies, Tribes, Ecology, city governments, non-governmental organizations (NGOs), local interested stakeholders, and Chelan PUD.

An important component of the minimum instream flow negotiations was that the Joint Fishery Parties (JFP), comprised of the state and federal fishery management agencies, Tribes, and Ecology, proposed a minimum instream flow level of 650 cfs for the Chelan River. Chinook and Steelhead Trout were the target species in the PHABSIM modeling for the JFP's initial 650 cubic feet per second (cfs) minimum instream flow proposal. The PHABSIM model projected the maximum amount of Chinook salmon spawning habitat in the lower Chelan River (Reach 4) of approximately four acres at this flow level. At that time, both units at the Project used approximately 2,200 cfs for maximum generation. Economic analysis of the 650 cfs minimum instream flow level would have resulted in the Project operating at a net loss on an annual basis. Chelan PUD rejected the JFP proposal on the grounds that the proposal would render the project uneconomic, and Chelan PUD would relinquish the license.

The NSWG continued discussions on methods to create four acres of Chinook spawning habitat under different flow regimes and other elements. Those discussions resulted in agreement on the following actions: construct a natural stream channel (Habitat Channel) in the lower Chelan River to provide additional spawning and rearing habitat for Steelhead Trout and Chinook salmon; provide additional spawning flows in the Habitat Channel via pumps only during Steelhead Trout and Chinook salmon spawning periods versus year around; fill in a portion of the tailrace to increase the amount of available spawning habitat for Chinook salmon; construct a new low level outlet (LLO) at the Lake Chelan Dam to provide minimum instream flows; and implement an 80 cfs minimum instream flow to enhance resident fishery resources in sections 1 through 3 in the Chelan River.

The license proposal was to institute an 80 cfs minimum instream flow for the Chelan River, primarily for species inhabiting reaches 1 and 2, and then construct a pump station and Habitat Channel to provide additional spawning flows and useable spawning habitat, respectively, in Reach 4 during the spring Steelhead Trout and fall Chinook salmon spawning periods. Species used for developing the minimum instream flow of 80 cfs for the Chelan River were: 1) adult Westslope cutthroat trout (reaches 1, 2, and 4); 2) spawning, juvenile, and adult rainbow trout (reaches 1, 2, and 4); 3) spawning, juvenile, and adult smallmouth bass (reaches 1, 2, and 4); spawning, juvenile, and adult suckers (reaches 1, 2, and 4); 4) spawning and juvenile Steelhead Trout (Reach 4); and spawning and juvenile Chinook salmon (Reach 4).

Since the river had been dewatered for over 76 years, it was not known what level of support for fish and water temperature could reasonably be achieved in the river. To make that determination, WDOE agreed to proceed with a ten-year compliance schedule and adaptive management plan. Chelan PUD worked with WDOE, federal and state fishery resource agencies, and other stakeholders to develop biological objectives and monitoring methods to determine whether the biological objectives could be achieved for the Chelan River.

Those objectives identify three key species of fish (Westslope Cutthroat Trout, Steelhead Trout and summer Chinook salmon) for restoration or enhancement. The biological objectives are described in the [Chelan River Biological Evaluation and Implementation Plan](#) (CRBEIP). As an adaptive management plan, any changes to the implementation measures are made in coordination with the Chelan River Fishery Forum (CRFF); however, WDOE retains authority to order additional changes or modifications to the extent necessary.

As a requirement of the new license, minimum flows were established for the Chelan River and that flow was initiated on October 15, 2009. The year-round minimum flow level is 80 cfs with a spring/early summer flow increase to mimic the natural hydrograph e.g., provide flushing flows. The spring/early summer flow increase is variable, depending on the level of winter snow deposition and runoff forecast. In dry years, when the runoff is predicted to be less than normal (within the 80% exceedance range of historical runoff volumes), then only the 80 cfs minimum flow is released. In average water years, when the runoff is predicted to be normal (within the 21% - 79% exceedance range or 60% of the years based on historical records), then a 200 cfs minimum flow is released from May 15 through July 15. The exact timing of the flow increases change depending on climatic conditions (spring temperatures or rain) and biological evaluations. In wet years, when runoff is predicted to be greater than normal (within the 20% exceedance level), then a 320 cfs minimum flow is released from mid-May through mid-July. Minimum flows greater than 80 cfs are subject to a ramping schedule. The license was amended to establish a new pump station minimum spawning flow requirement in Reach 4 of 260 cfs instead of the original minimum of 320 cfs ([Orders 161 FERC ¶ 62,182, December 7, 2017; 162 FERC ¶ 62,052, January 23, 2018](#)).

In addition to these minimum flows, the CRBEIP includes criteria to define wet, dry, and average water years; ramping rates necessary to prevent stranding of aquatic organisms; criteria for physical modifications to the stream channel and tailrace; and a monitoring and evaluation program. Specific criteria is included in the Comprehensive Plan for lake level refill

management to avoid excessive spill levels and scouring flows in the Chelan River; for example, Chelan PUD avoids spilling flows greater than 6,000 cfs, to the extent feasible. The instream flow regime is intended to establish a functional aquatic ecosystem supportive of native fish species in the Chelan River, and provide enhanced conditions for salmon and Steelhead Trout spawning and rearing in the lower reach and tailrace.

The adaptive management plan contemplates, at the end of the ten years or sooner, WDOE will determine whether Chelan PUD has undertaken all known, reasonable, and feasible measures to achieve the biological objectives, and if so whether water quality standards have been fully achieved. If Chelan PUD has undertaken such measures and water quality standards have not been fully achieved, WDOE will seek to resolve such non-compliance through a process to make site-specific and/or use-based rule changes to the water quality standards or such other process as may be consistent with state and federal law.

Chelan PUD has been providing biological objectives status updates. The status updates are available online; the most recent update is [here](#). The 10-year compliance deadline for WDOE is December 31, 2019.

Reports and other compliance information related to the CRBEIP can be found [here](#) under License Article 405 and Appendix D – 401 Water Quality Certification.

*2.2.2. Water Quality*

Criterion	Standard	Instructions
B	2	Agency Recommendation: <ul style="list-style-type: none"> <li>• If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation.</li> <li>• Provide a copy of the most recent Water Quality Certificate, including the date of issuance.</li> <li>• Identify any other agency recommendations related to water quality and explain their scientific or technical basis.</li> <li>• Describe all compliance activities related to the water quality related agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations.</li> </ul>

The project license requires that Chelan PUD provide minimum flows to the Chelan River and monitor those flows and water temperatures at various locations. It also required the construction of a Low Level Outlet at Chelan Dam, a lower river Habitat Channel and spawning areas in the tailrace, and operations to protect aquatic life through flow ramping rates and powerhouse operations. Chelan PUD files an Annual Flow and Temperature Report with FERC documenting compliance. The most recent report is available online [here](#), which indicates that water quality standards were met for dissolved oxygen, pH and total dissolved gas during the monitoring periods.

The Washington State water quality temperature criterion for salmonid spawning, rearing, and migration in freshwater waterbodies is a 7-day average of the daily maximum temperatures (7-DAD max) of 17.5°C. Water temperatures recorded in the Chelan River are often in excess of the temperature criterion in summer months. The 17.5°C numeric temperature criterion for freshwater is a biological benchmark that signifies when water temperatures begin to exceed the preferred temperature range for cold-water salmonid fish species. Rainbow trout from hatchery releases have also been observed in the upper Chelan River above the dam. However, there is no historical documentation of native salmonid (cutthroat trout) populations in the Chelan River below the dam site prior to construction of the Project. Based on current temperature measurements in Lake Chelan and the Chelan River above the Project, and the results of temperature modeling, it is probable that water temperatures during summer in the Chelan River were substantially warmer than 17.5°C prior to construction of the project.

However, the Chelan River Biological Evaluation and Implementation Plan (CRBEIP) includes the biological objective of providing habitat for Westslope Cutthroat Trout, to the extent feasible, given the high water temperatures coming from Lake Chelan and the need to maintain and protect the existing beneficial uses of Lake Chelan and the Chelan River. Water quality temperatures are reported quarterly during most of the year, with results made available online [here](#).

Chelan PUD is on a 10-year compliance schedule to evaluate and monitor the beneficial uses of the Chelan River based on the biological objectives established in the water quality certificate and license. After 10 years of license implementation, Chelan PUD is required to provide WDOE with the information necessary to make a determination on whether the biological objectives in the CRBEIP and the state water quality standards have been achieved. If WDOE determines that the biological objectives have been met but non-compliance with water quality standards exists, WDOE intends that it will initiate a process to modify the applicable standards through rulemaking or such alternative process as may otherwise be authorized under applicable state and federal law. The compliance schedule deadline is December 31, 2019. The license measures necessary to begin implementation of the water quality measures were not in place until 2009.

Year one of the ten year compliance schedule began October 2009 and ended December 31, 2010. This was the year that Chelan PUD completed the construction of the Low Level Outlet, pump station and Habitat Channel, and began to provide minimum instream flows to the Chelan River. Water quality and biological monitoring did not occur until the Habitat Channel and river was watered up. See correspondence with FERC regarding a Request for Time Extension – Minimum Flows in Chelan River and Reach 4 Stream Channel Improvements, including the [FERC order revising the Article 408 schedule](#); [Chelan PUD's revised schedule](#); [FERC's order granting extension of time under Article 408](#); and [Chelan PUD's request for a time extension](#).

The following section is comprised of excerpts and notes taken from the State of Washington Department of Ecology , Order No. 1233, 401 Water Quality Certification for the Lake Chelan Hydroelectric Project (FERC No. 637):

“Prior to 2009, the Chelan Dam diverted water from most of the Chelan River. Historically, prior to the Project, during most of the summer water temperatures in the Chelan River would have exceeded 17.5<sup>0</sup> C, which is the target under what used to be Class A standards. Ecology standards do not allow a human activity to increase water temperature by greater than 0.3<sup>0</sup> C when water is above 17.5<sup>0</sup> C. Studies performed for this Project predict that the proposed minimum flows for the Chelan River would result, at times, in temperature more than 0.3<sup>0</sup> C above temperatures that would naturally occur.

Where it is not feasible to fully meet water quality standards, Clean Water act regulations allow Ecology to take action to remove or modify a designated use or to modify the criteria assigned to protect that designated use or other criteria would sufficiently protect that use. Because the Chelan River had been dewatered for over 76 years prior to relicensing, and it was not known what level of support for fish and water temperature for such use could be reasonably achieved in the river. To make that determination, Ecology implemented the best approach by proceeding with a ten-year adaptive management plan which will allow a sufficiently lengthy period of time to determine what level of fish support and water temperature is reasonable and feasible to achieve in the Chelan River.

Ecology worked collaboratively with the relicensing team that included Chelan PUD, federal and state fishery resource agencies, and other stakeholders to develop biological objectives to attempt to be achieved in the Chelan River during the ten year adaptive management plan. Those objectives identify three key species of fish (Westslope Cutthroat Trout, Steelhead Trout, and Summer Chinook salmon) for restoration and enhancement. The biological objectives are described in the Chelan River Biological Evaluation and Implementation Plan, which is Chapter 7 of the Lake Chelan Comprehensive Settlement Agreement.

The adaptive management plan contemplates, at the end of the ten years or sooner, Ecology will determine whether Chelan PUD has undertaken all known, reasonable, and feasible measures to achieve the biological objectives, and if so, whether water quality standards have been fully achieved. If Chelan PUD has undertaken such measures and water quality standards have not been fully achieved, Ecology will seek to resolve such non-compliance through a process to make site-specific and/or use based rule changes to the water quality standards of such other process as may be consistent with state and federal law.

The intent of these actions is to support the goals of the State of Washington to “maintain the highest possible standards to ensure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wildlife, birds, game, fish, and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington.” (RCW 90.48.010).”

As described above, the adaptive management plan contemplates, Ecology will determine whether Chelan PUD has undertaken all known, reasonable, and feasible measures to achieve the

biological objectives after 10 years of implementation, and if so whether water quality standards have been fully achieved. If Chelan PUD has undertaken such measures and water quality standards have not been fully achieved, Ecology will seek to resolve such non-compliance through a process to make site-specific and/or use-based rule changes to the water quality standards or such other process as may be consistent with state and federal law.

Reports and other compliance information related to the CRBEIP can be found [here](#) under License Article 405, 408 and Appendix D – 401 Water Quality Certification.

### 2.2.3 Upstream Fish Passage

Criterion	Standard	Instructions
C	2	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent).</li> <li>• Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.</li> <li>• Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.</li> </ul>

Species observed during snorkel surveys conducted in Reach 1 of the Chelan River, in order of frequency, include the following: Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*); smallmouth bass (*Micropterus dolomieu*); Rainbow Trout (*O. mykiss*); Northern pikeminnow (*Ptychocheilus oregonensis*); suckers (*Catostomus sp.*); Tench (*Tinca tinca*); mountain whitefish (*Prosopium williamsoni*); and cyprinid fry (*Rhinichthys sp.*). Migratory (potamodromous) species likely moving between the dam and the end of Reach 2 would be Westslope Cutthroat and Rainbow trout.

A barrier analysis study prepared for relicensing the project concluded that five natural barriers in the Chelan River gorge would be impassible to Steelhead Trout and other anadromous salmonid species at all flows. Without passage through the river (Zone 2), these species are not, and were never, present in the lake. Based on these results and the lack of historic evidence indicating the presence of anadromous fish in Lake Chelan, the Chelan River is only suitable for anadromous fish in Reach 4. Reach 4 is the 0.49-mile long section of the Chelan River extends from the mouth of the gorge to the powerhouse tailrace, so it will be addressed under Zone 3. The rest of the Chelan River is managed for native, non-anadromous species.

See the [Chelan River Biological Evaluation and Implementation Plan](#) (CRBEIP) and the final [Tributary Barrier Analysis](#).

### 2.2.4 Downstream Fish Passage

Criterion	Standard	Instructions
D	1	Not Applicable / De Minimis Effect:

		<ul style="list-style-type: none"> <li>• Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines).</li> <li>• For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles.</li> <li>• Document available fish distribution data and the lack of migratory fish species in the vicinity.</li> <li>• If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.</li> </ul>
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Snorkel survey data for Reach 1 of the Chelan River presented in the [2017 Biological Objectives Status Report](#) documents fish distribution and potamodromous species in this section of the Chelan River. Primary species are Westslope Cutthroat (*Oncorhynchus clarki lewisi*) and Rainbow trout (*O. mykiss*).

Current Project operations have provided considerable benefit to these species since 2009. Prior to 2009, the Chelan River was dry except during spring spill events to control lake elevation because the Project did not have a minimum instream flow requirement in either of the two previous licenses. A significant benefit to aquatic and terrestrial resources in the Chelan River and adjacent area is the institution of the 80 cfs minimum flow requirement in the current license. This flow was initiated in the fall of 2009. Spring freshet flows of 200 cfs (average runoff volume) and 320 cfs (high runoff volume) are provided in the Chelan River from May 15 to July 15 each year, which offer additional benefit to Chelan River resources that did not exist prior to 2009.

Downstream fish passage into the Chelan River is discussed under Zone 1. Beyond the entrainment investigation, there are no agency recommendations specific to the Chelan River .

#### 2.2.5 Watershed and Shoreline Protection

Criterion	Standard	Instructions
E	2	Agency Recommendation: <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Shoreline management issues, specifically erosion, are discussed under Zone 1. There are no agency recommendations for shoreline management specific to the Chelan River. However, the

Chelan River Fishery Forum (CRFF) did recommend conducting a riparian revegetation feasibility investigation and developing a planting plan, based on the results of the feasibility investigation, for Reach 1 of the Chelan River.

The Chelan River Riparian Revegetation Feasibility Investigation was completed in 2015 (see Chelan River Riparian Revegetation Feasibility Investigation, attached) and the resulting Chelan River Riparian Planting Plan was completed in 2017 (see Chelan River Fishery Forum Revegetation Planting Plan). Both documents were developed with the Chelan River Fishery Forum (CRFF) and included agency participation in selecting the consultant, report reviews, and next steps. The CRFF will determine when to implement the planting plan. Currently, the plan is to implement the Riparian Planting Plan in the fall of 2019.

*2.2.6 Threatened and Endangered Species Protection*

Criterion	Standard	Instructions
F	1	<p>Not Applicable / De Minimis Effect:</p> <ul style="list-style-type: none"> <li>• Document that there are no listed species in the facility area or affected riverine zones downstream of the facility.</li> <li>• If listed species are known to have existed in the facility area in the past but are not currently present, explain why the facility was not the cause of the extirpation of such species.</li> <li>• If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.</li> </ul>

There are no endangered or threatened species present in Zone 2. A barrier analysis study concluded that five natural barriers in the Chelan River would be impassible to Steelhead Trout and other anadromous salmonid species at most flows. Three were impassable at all flows based on passage criteria for Steelhead Trout. Based on these results and the lack of historic evidence indicating the presence of anadromous fish in Lake Chelan, the Chelan River is only suitable for anadromous fish in Zone 3 (Reach 4 of the river). See the [Chelan River Biological Evaluation and Implementation Plan](#) and the final [Tributary Barrier Analysis](#).

*2.2.7. Cultural and Historic Resources Protection*

Criterion	Standard	Instructions
G	2	<p>Approved Plan:</p> <ul style="list-style-type: none"> <li>• Provide documentation of all approved state, provincial, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility.</li> <li>• Document that the facility is in compliance with all such plans.</li> </ul>

To protect cultural resources, Chelan PUD is implementing a Historic Properties Management Plan (HPMP) and programmatic agreement with the Commission, the State Historic Preservation

Officer, and the Confederated Tribes of the Colville Reservation Tribal Historic Preservation Officer. Cultural resources issues are discussed under Zone 1.

The HPCRMP is part of the Comprehensive Settlement Agreement. Monitoring reports and other compliance information related to the HPCRMP can be found [here](#) under License Article 410 and Settlement Agreement Article 10.

*2.2.8 Recreational Resources*

Criterion	Standard	Instructions
H	2	Agency Recommendation: <ul style="list-style-type: none"> <li>• Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations.</li> <li>• Document that the facility is in compliance with all such recommendations and plans.</li> </ul>

The American Whitewater Association was a party to the Comprehensive Settlement Agreement and supported certain whitewater flows in the Chelan River. Under the License, Chelan PUD conducted a three-year whitewater boating monitoring study, providing an annual schedule of releases for kayaks in the Chelan River. Chelan PUD developed a reservation system requiring at lieas six or more kayaers to make reservations to ensure the schedule releases. Chelan PUD submitted a final report upon completion of the whitewater boating monitoring study which included recommendations for providing whitewater releases for the remainder of the license term.

On July 16, 2012, FERC issued an order amending the project’s Recreation Resources Management Plan (RRMP) after the licensee completed a whitewater boating monitoring study ([140 FERC ¶ 62,051](#)). The order approved several modifications to the whitewater boating section of the RRMP that were recommended by the licensee and agreed to by American Whitewater (AW). These include: annual whitewater flow releases scheduled for the third Saturday and Sunday in September, at 375 and 400 cubic feet per second (cfs), respectively; continued paddler use of a reservation system that includes both on-line and on-site registration; and paddler adherence to various requirements concerning safety, equipment, and liability.

The amended RMPP also requires that surveys of paddlers be conducted following each release, an annual meeting be held between the licensee and AW, and a report evaluating whitewater boating releases, including recommendations on future releases, be submitted to FERC every three years. Every participant during each year covered by the report was invited to fill out a survey evaluating their experience. The licensee received 31 completed surveys in 2012, 25 completed surveys in 2013, and 6 completed surveys in 2014. Most respondents were “extremely satisfied” and felt flows were acceptable and crowding was not a problem.

Based on monitoring and survey results, Chelan PUD is maintaining these whitewater release dates, flows, evaluation methods, and the reservation system. In 2015, Chelan PUD asked FERC to modify the reporting schedule, changing it from every three years to every 10 years. FERC

approved the request on May 20, 2015 and the next whitewater boating report is due on May 1, 2025.

Chelan PUD does not provide funding for the whitewater boating event. Instead, Chelan PUD ensures the availability of the flows the third weekend in September annually, and provides web information promoting the event. Chelan PUD incurs the costs associated with lost generation and some staff labor. In 2018, whitewater boating was suspended due to slope instability in Reach 2 of the gorge. American Whitewater and Chelan PUD are discussing options for accessing the gorge in an alternative location for future years due to the inability to estimate when the slope issue will resolve.

Whitewater boating is the only recreation allowed in the Gorge, other than a 1-mile trail in Reach 1. Chelan PUD agreed to construct the non-motorized, non-paved, multi-use trail below the Lake Chelan Dam in Reach 1 of the Chelan River to provide managed access to the Chelan River and connect to the existing Riverwalk Loop Trail. The approx. one-mile trail was completed in November 2008, and includes a 20-space parking lot, two observation lookouts with benches, and 280 feet of rail fence.

Reports and compliance information for whitewater boating in the Chelan River can be found [here](#) under License Articles 407 and Settlement Agreement Article 11.

### 2.3 Zone of Effect 3 – Reach 4 of the Chelan River

The standards applicable to each criterion for Zone 3 are summarized in Table 1 and described below. Zone 3 encompasses Reach 4 of the Chelan River, a 0.49-mile long section extending from the mouth of the gorge to the powerhouse tailrace. The Chelan River elements included in Zone 3 and identified in Picture 7 are: the Chelan River Habitat Channel (lower Chelan River); overflow channel; spawning flow pump station and spawning flow canal; Lake Chelan powerhouse; and Lake Chelan switchyard and Chelan river gorge.

Resource agency recommendations for the project are incorporated into the [Comprehensive Settlement Agreement](#) for the Project, signed on October 8, 2003 and incorporated into a new [license for the Project](#) on November 6, 2006. The water quality certificate for the project was issued June 1, 2004 ([Order number 1233](#)) and amended on the following dates: [Order Number 6215](#) – amended November 24, 2008; [Order Number 9389](#) - amended August 28, 2012; and [Order Number 15481](#) - amended November 3, 2017. There has not been a FERC Environmental Inspection Report issued since 2012.

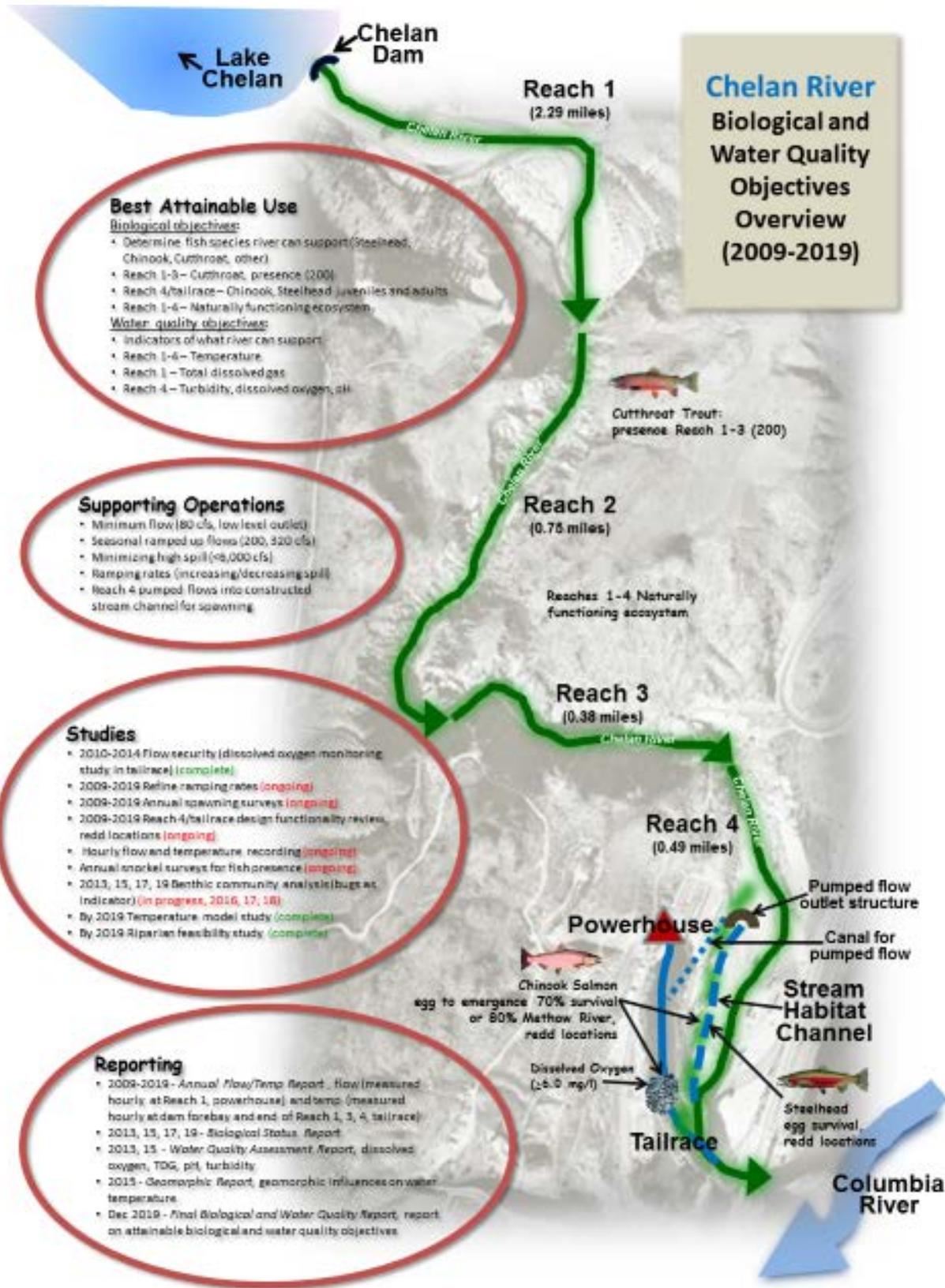
Table 3 – Zone of Effect 3

Criterion	Standards Applied	Standards Applied				
		1	2	3	4	Plus
A	Ecological Flow Regimes		x			x
B	Water Quality		x			

C	Upstream Fish Passage		x			
D	Downstream Fish Passage	x				
E	Watershed and Shoreline Protection	x				
F	Threatened and Endangered Species Protection			x		
G	Cultural and Historic Resources Protection		x			
H	Recreational Resources		x			

Picture 7: Reach 4 of the Chelan River and Project tailrace





2.3.1. Ecological Flow Standards

Criterion	Standard	Instructions
A	2	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent).</li> <li>• Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> <li>• Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow).</li> </ul>
A	Plus	<p>Bonus Activities:</p> <p>If an adaptive management program is in place, provide sufficient information to understand.</p> <ul style="list-style-type: none"> <li>• If non-flow habitat enhancements have been applied, explain what they are, how their benefits are being monitored, and how they are achieving a positive net benefit to fish and wildlife resources.</li> </ul>

The Chelan River is only suitable for anadromous fish in Reach 4. Under the license, Chelan PUD agreed to provide spawning and rearing habitat for Chinook salmon in Reach 4 and the tailrace. Chelan PUD modified the tailrace area in 2008 with suitable sized substrate material to create braided bars with low velocity rearing and spawning habitat. The habitat is maintained with suitable spawning flows and adequate intra-gravel flow for incubation in the tailrace. As needed, flows are maintained through operation of the powerhouse at minimum flow levels. The success of spawning and incubation through emergence is monitored and evaluated pursuant to license reporting requirements.

Chelan PUD constructed the Chelan River Habitat Channel in 2008 and 2009 to improve spawning and rearing habitat in Reach 4 of the Chelan River. Minimum flows were initiated in 2009. Flow provided in the Chelan River Habitat Channel for Steelhead Trout and Chinook salmon was initially a minimum of 320 cfs by a combination of spill and pumping. Five pumps are available to meet the minimum spawning flow requirement in the Habitat Channel. This assured that the 320 cfs minimum flow would always be provided with the addition of the 80 cfs minimum flow coming from Reaches 1-3. However, at normal tailwater elevations, the 5 pumps often discharge from 250-260 cfs and the total Habitat Channel flows during spawning periods have frequently been 340-350 cfs, which is 20-30 cfs higher than the minimum design flow.

Observed water velocities were higher than desirable when all five pumps operating; suggesting that more habitat would be available at lower flows. The Chelan River Fishery Forum (CRFF) proposed and implemented a temporary change in pumped flow operation, which has been used for the past four years of Chinook salmon spawning seasons. Chinook salmon spawning use was somewhat higher during the four years of reduced flow. With concurrence from the CRFF, Chelan PUD applied for, and received, a permanent amendment to the Project’s license to establish a new pump station minimum spawning flow requirement in Reach 4 of 260 cfs instead of the original minimum of 320 cfs ([Orders 161 FERC ¶ 62,182, December 7, 2017](#); [162 FERC ¶ 62,052, January 23, 2018](#)).

Seasonal flows provided to the Chelan River are shown below. Compliance monitoring is conducted via flows meters at the low level outlet (LLO) structure, which is located at the dam, and pump station canal. Flows are reported quarterly per the license 401 water quality certification.

**Minimum Instream Flow Requirements for the Chelan River**

Reach	Dry year (cfs)	Average year (cfs)	Wet year (cfs)
1, 2 & 3 <sup>1</sup>	80 all months	80 July 16-May 14	80 July 16-May 14
		May 14	May 14
		ramp up to 200	Ramp up to 320
		200 May 15-July 15	320 May 15-July 15
		July 16-	July 16-
		ramp down to 80	Ramp down to 80
4 <sup>2</sup> Spawning flow	80 + 180 pumped March 15 to May 15 and Oct. 15 to Nov. 30	260 by combination of spill & pumping March 15 to May 15 and Oct. 15 to Nov. 30 Incubation flow, as needed	260 by combination of spill & pumping March 15 to May 15 and Oct. 15 to Nov. 30  Incubation flow, as needed

<sup>1</sup> Flows measured at the dam by ultrasonic flow meter.

<sup>2</sup> Flows measured at the dam and at the pump station by ultrasonic flow meter.

Flow and ramping rate deviations have occurred at the Project and been reported to FERC as elements of the CRBEIP have been implemented. However, none of the deviations reported had environmental impacts or were deemed license violations by FERC. Links to these reports and FERC responses can be found in the References under Article 405.

Reports and compliance information for flows in the Reach 4 can be found [here](#) under License Article 405 and 408.

2.3.2. Water Quality

Criterion	Standard	Instructions
B	2	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation.</li> <li>• Provide a copy of the most recent Water Quality Certificate, including the date of issuance.</li> <li>• Identify any other agency recommendations related to water quality and explain their scientific or technical basis.</li> <li>• Describe all compliance activities related to the water quality related agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations.</li> </ul>

Chelan PUD is on a 10-year compliance schedule to evaluate and monitor the beneficial uses of the Chelan River based on the biological objectives established in the water quality certificate and license. After 10 years of license implementation, Chelan PUD is required to provide WDOE with the information necessary to make a determination on whether the biological objectives in the CRBEIP and the state water quality standards have been achieved. If WDOE determines that the biological objectives have been met but non-compliance with water quality standards exists, WDOE intends that it will initiate a process to modify the applicable standards through rulemaking or such alternative process as may otherwise be authorized under applicable state and federal law. The compliance schedule deadline is December 31, 2019. The license measures necessary to begin implementation of the water quality measures were not in place until 2009.

Year one of the ten year compliance schedule began October 2009 and ended December 31, 2010. This was the year that Chelan PUD completed the construction of the Low Level Outlet, pump station and Habitat Channel, and began to provide minimum instream flows to the Chelan River. Water quality and biological monitoring did not occur until the Habitat Channel and river was watered up. See attached correspondence with FERC regarding a Request for Time Extension – Minimum Flows in Chelan River and Reach 4 Stream Channel Improvements.

The following section is comprised of excerpts and notes taken from the State of Washington Department of Ecology , Order No. 1233, 401 Water Quality Certification for the Lake Chelan Hydroelectric Project (FERC No. 637):

“Prior to 2009, the Chelan Dam diverted water from most of the Chelan River. Historically, prior to the Project, during most of the summer water temperatures in the Chelan River would have exceeded 17.5<sup>0</sup> C, which is the target under what used to be Class A standards. Ecology standards do not allow a human activity to increase water temperature by greater than 0.3<sup>0</sup> C when water is above 17.5<sup>0</sup> C. Studies performed for

this Project predict that the proposed minimum flows for the Chelan River would result, at times, in temperature more than 0.3<sup>0</sup> C above temperatures that would naturally occur.

Where it is not feasible to fully meet water quality standards, Clean Water act regulations allow Ecology to take action to remove or modify a designated use or to modify the criteria assigned to protect that designated use or other criteria would sufficiently protect that use. Because the Chelan River had been dewatered for over 76 years prior to relicensing, and it was not known what level of support for fish and water temperature for such use could be reasonably achieved in the river. To make that determination, Ecology implemented the best approach by proceeding with a ten-year adaptive management plan which will allow a sufficiently lengthy period of time to determine what level of fish support and water temperature is reasonable and feasible to achieve in the Chelan River.

Ecology worked collaboratively with the relicensing team that included Chelan PUD, federal and state fishery resource agencies, and other stakeholders to develop biological objectives to attempt to be achieved in the Chelan River during the ten year adaptive management plan. Those objectives identify three key species of fish (Westslope Cutthroat Trout, Steelhead Trout, and Summer Chinook salmon) for restoration and enhancement. The biological objectives are described in the Chelan River Biological Evaluation and Implementation Plan, which is Chapter 7 of the Lake Chelan Comprehensive Settlement Agreement.

The adaptive management plan contemplates, at the end of the ten years or sooner, Ecology will determine whether Chelan PUD has undertaken all known, reasonable, and feasible measures to achieve the biological objectives, and if so, whether water quality standards have been fully achieved. If Chelan PUD has undertaken such measures and water quality standards have not been fully achieved, Ecology will seek to resolve such non-compliance through a process to make site-specific and/or use based rule changes to the water quality standards of such other process as may be consistent with state and federal law.

The intent of these actions is to support the goals of the State of Washington to “maintain the highest possible standards to ensure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wildlife, birds, game, fish, and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington.” (RCW 90.48.010).”

A number of criteria were established under the Comprehensive Plan to measure components leading to success in achieving biological objectives, including water quality requirements and standards for egg to fry survival. Other monitoring and evaluation activities include fish surveys and monitoring of benthic macroinvertebrate populations.

Three years of egg to emergence studies in the Habitat Channel showed an average survival of 81 percent for Chinook salmon. The biological objective is an emergence survival of at least 70

percent in the constructed spawning habitat in the Habitat Channel. Minimum flows of 80 cfs are maintained in the Habitat Channel.

Water quality monitoring in the Habitat Channel has demonstrated that the surface water meets the water quality standards for dissolved oxygen during the Steelhead Trout spawning and incubation season. The Habitat Channel is never without sufficient flow to maintain intragravel dissolved oxygen.

Reports and compliance information for flows in the Reach 4 can be found [here](#) under License Articles 405 and 408

### 2.3.3 Upstream Fish Passage

Criterion	Standard	Instructions
C	2	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent).</li> <li>• Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.</li> <li>• Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.</li> </ul>

Zone 3 provides anadromous fish spawning habitat for fish migrating up the Columbia River. Anadromous fish do not migrate upstream via Reach 4 of the Chelan River.

Anadromous migratory species observed in the Habitat Channel in Reach 4 of the Chelan River include the following: Steelhead/Rainbow Trout (*Oncorhynchus mykiss*); and Chinook salmon (*O. tshawytscha*). Other species that are likely making migrations into, and out of, the Habitat Channel are: Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*); Northern pikeminnow (*Ptychocheilus oregonensis*); and suckers (*Catostomus sp.*).

Both NMFS and USFWS reserved their Section 18 fishway prescription authority during the Lake Chelan Project relicensing process. However, neither Service required fish passage at the dam because they acknowledged the data that anadromous fish (such as ESA-listed Steelhead Trout) penetration to the dam is precluded by impassible barriers in Reach 3 of the Chelan River under current conditions. Additionally, the Services recognized existing data demonstrating that anadromous salmonids never have had access to Lake Chelan due to impassible barriers in the Chelan River.

*2.3.4 Downstream Fish Passage*

Criterion	Standard	Instructions
D	1	<p>Not Applicable / De Minimis Effect:</p> <ul style="list-style-type: none"> <li>• Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines).</li> <li>• For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles.</li> <li>• Document available fish distribution data and the lack of migratory fish species in the vicinity.</li> <li>• If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.</li> </ul>

Zone 3 is Reach 4 of the Chelan River which naturally feed into the Columbia River. There are no downstream passage impacts, no physical obstruction or increased mortality relative to natural downstream movement. Instead, Reach 4 provides spawning habitat for Chinook salmon and Steelhead Trout.

*2.3.5 Watershed and Shoreline Protection*

Criterion	Standard	Instructions
E	2	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Shoreline management issues, specifically erosion, are discussed under Zone 1. There are no agency recommendations for shoreline management specific to the Reach 4. Property in the lower Chelan River and tailrace is owned by Chelan PUD. The Chelan River Habitat Channel, is influenced by high spills flows in the Chelan River that are required for lake level control. A primary goal of the CRBEIP is to minimize high spill levels in the Chelan River in excess of 6,000 cfs. High spill levels have the potential for causing gravel scour, excessive gravel deposition, and compromising the integrity of habitat features (log jams, boulder clusters, vegetation, etc.) in the Habitat Channel.

2.3.6 Threatened and Endangered Species Protection

Criterion	Standard	Instructions
F	3	<p>Recovery Planning and Action:</p> <ul style="list-style-type: none"> <li>• If listed species are present, document that the facility is in compliance with relevant conditions in the species recovery plans, incidental take permits or statements, biological opinions, habitat conservation plans, or similar government documents.</li> <li>• Document that any incidental take permits and/or biological opinions currently in effect were designed as long-term solutions for protection of listed species in the area.</li> </ul>

Federal ESA-listed species that may inhabit, or be located in the vicinity of, the Chelan River Reach 4 and Habitat Channel are Upper Columbia River spring-run Chinook salmon (Endangered); Upper Columbia River Steelhead Trout (Threatened); Bull Trout (Threatened) and Ute ladies-tresses (Threatened).

The NMFS concluded in its [Biological Opinion](#) (BiOp) that the proposed action is not likely to jeopardize the continued existence of Upper Columbia River (UCR) spring-run Chinook salmon, UCR steelhead, or other ESA-listed species in the Columbia, Snake or Willamette rivers under NMFS jurisdiction. NMFS also concluded that the proposed action is not likely to result in destruction or adverse modification of any designated critical habitat for these species. As required by Section 7 of the ESA, NMFS also prepared an incidental take statement (ITS) with the BiOp. The ITS describes reasonable and prudent measures NMFS considered necessary or appropriate to minimize incidental take associated with relicensing the Project. The BiOp includes also the results of NMFS consultation regarding the action’s likely effects on essential fish habitats (EFH) pursuant to Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act.

In the [Mid-Columbia Recovery Unit Implementation Plan \(RUIP\) for Bull Trout](#), the Lake Chelan basin is described as a historic core area because it is currently unoccupied and bull trout are extirpated from the basin. According to the RUIP, the basin does retain the potential for restoration of native fish assemblages, and because of its cold waters, it may provide refuge as climate change progresses, and the short section of the lower Chelan River (Reach 4) is considered bull trout foraging, migration, and overwintering (FMO) habitat. As described in the [Final Biological Objectives Status Report](#), snorkel surveys conducted by Chelan PUD have documented bull trout presence in the Chelan River Habitat Channel and Project tailrace. The Lake Chelan license does not contain requirements specific to bull trout. The USFWS determined that construction of the Chelan River Habitat Channel and year round minimum instream flows to the Chelan River Reach 4 would provide increased foraging, migration and overwintering habitat for bull trout.

Ute Ladies’ -tresses have not been observed in the Chelan River Habitat Channel. Populations of this species occur along the shoreline of the Columbia River upstream of the confluence of the Chelan and Columbia rivers and are not affected by Lake Chelan Project operations.

On October 10, 2003, FERC issued its [Final Environmental Assessment](#) (FEA), which examined the effects of the preferred alternative, and the concurrent determinations did not change as a result of this examination. The FEA concluded that relicensing the Lake Chelan Project as proposed in the Comprehensive Settlement Agreement, including FERC recommended measures, would not likely affect Upper Columbia River spring-run Chinook salmon, bull trout, or Ute ladies-tresses. FERC did determine that Upper Columbia River Steelhead Trout would likely be adversely affected, but only during construction related to habitat improvements in the Chelan River Habitat Channel; those habitat improvements were completed in 2009. FERC asked USFWS for concurrence twice (in a letter dated November 29, 2002 and [a letter dated December 2, 2003](#)). On December 24, 2003, the USFWS wrote a letter that “concur[s] with the commission’s determination that the proposed relicensing may affect, but is not likely to adversely affect the bald eagle, Ute ladies’-tresses, and bull trout.”

State sensitive species or species of concern that may inhabit, or be located in the vicinity of, the project tailrace include Pygmy Whitefish (Sensitive); Upper Columbia River spring-run Chinook salmon (Candidate); Upper Columbia River Steelhead Trout (Candidate) and Bull Trout (Candidate). Pygmy Whitefish do occur in the Lake Chelan Basin, but have been documented to inhabit only Lake Chelan. This species does occur in the Columbia River, but has not been observed in any section of the Chelan River. See the [Washington State Status Report for the Pygmy Whitefish](#).

Chinook salmon and Steelhead Trout spawning habitat was created in 2009 (Reach 4 Habitat Channel), with the habitat available for use by Chinook salmon in that year. Suitable spawning habitat for Chinook salmon was created in the Reach 4 Habitat Channel, and was colonized immediately by Chinook salmon in the first year following construction – and that use has continued.

Full achievement of biological objective in Zone 3 has been documented through spawning ground redd counts, which show use by Chinook salmon has increased since the construction of this habitat. Since gravel placement in the tailrace and the construction in Reach 4 of the Habitat Channel, the combined Chinook salmon redd counts in the tailrace, in the Habitat Channel and in the Columbia River below the confluence have increased. Prior to 2008, the highest redd count was 253. The annual redd counts have increased from an average of 160 redds per year (1998 – 2007) to an average of over 400 redds per year since 2008 when the additional tailrace habitat was constructed.

Steelhead Trout spawning has been observed in the Habitat Channel in seven of the eight years since Steelhead Trout spawning flows were first provided in 2010. The number of redds has varied, with 11 redds in 2010, 21 redds in 2011, 7 redds in 2012, 21 redds in 2013, 0 redds in 2014, 3 redds in 2015, 2 redds in 2016, and 29 redds in 2017. The lower number of Steelhead Trout redds from 2014 – 2016 coincides with low adult Steelhead Trout run size returning to habitats upstream from Rocky Reach Dam. The high number of redds counted in 2017 was surprising in the face of another low adult Steelhead Trout run size returning to habitats upstream from Rocky Reach Dam last year.

Reports and compliance information for flows in the Reach 4 and Project tailrace can be found [here](#) under License Articles 405 and 408.

*2.3.7. Cultural and Historic Resources Protection*

Criterion	Standard	Instructions
G	2	Approved Plan: <ul style="list-style-type: none"> <li>• Provide documentation of all approved state, provincial, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility.</li> <li>• Document that the facility is in compliance with all such plans.</li> </ul>

To protect cultural resources, Chelan PUD is implementing a Historic Properties Management Plan (HPMP) and programmatic agreement with the Commission, the State Historic Preservation Officer, and the Confederated Tribes of the Colville Reservation Tribal Historic Preservation Officer. Cultural resources issues are discussed under Zone 1.

The Lake Chelan Historic Properties Management Plan (HPMP) is part of the Comprehensive Settlement Agreement. Monitoring reports and other compliance information related to the HPCRMP can be found here under License Article 410 and Settlement Agreement Article 10.

*2.3.8 Recreational Resources*

Criterion	Standard	Instructions
H	1	The facility does not occupy lands or waters to which the public can be granted access and does not otherwise impact recreational opportunities in the vicinity of the facility.

There are no recreation facilities associated with the Lake Chelan Project in Zone 3. Lake Chelan Project recreational facilities are discussed under Zone 1 and Zone 2. However, Chelan PUD does own and maintain the 53-acre Chelan Falls Powerhouse Park, which is in the vicinity of Zone 4, under its Rocky Reach Hydroelectric Project license (P-2145).

*2.4 Zone of Effect 4 – Lake Chelan Project Tailrace*

The standards applicable to each criterion for Zone 4 are summarized in Table 4 and described below. Zone 4 encompasses the Project tailrace that begins at the powerhouse and discharges approximately 1,400 feet downstream into the Columbia River.

Resource agency recommendations for the project are incorporated into the [Comprehensive Settlement Agreement](#) for the Project, signed on October 8, 2003 and incorporated into a new [license for the Project](#) on November 6, 2006. The water quality certificate for the project was issued June 1, 2004 ([Order number 1233](#)) and amended on the following dates: [Order Number 6215](#) – amended November 24, 2008; [Order Number 9389](#) - amended August 28, 2012; and [Order Number 15481](#) - amended November 3, 2017. There has not been a FERC Environmental Inspection Report issued since 2012.

Table 4 – Zone of Effect 4

Criterion	Standards Applied	Standards Applied				
		1	2	3	4	Plus
A	Ecological Flow Regimes		x			
B	Water Quality		x			
C	Upstream Fish Passage		x			
D	Downstream Fish Passage		x			
E	Watershed and Shoreline Protection	x				
F	Threatened and Endangered Species Protection			x		
G	Cultural and Historic Resources Protection		x			
H	Recreational Resources	x				

2.4.1. Ecological Flow Standards

Criterion	Standard	Instructions
A	2	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent).</li> <li>• Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> </ul>

		<ul style="list-style-type: none"> <li>• Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow.</li> </ul>
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The Chelan River is only suitable for anadromous fish in the tailrace. Under the license, Chelan PUD agreed to provide spawning and rearing habitat for Chinook salmon in Reach 4 and the tailrace. Chelan PUD modified the tailrace area in 2008 with suitable sized substrate material to create rearing and spawning habitat. The habitat is maintained with suitable spawning flows and adequate intra-gravel flow for incubation in the tailrace. As needed, flows are maintained through operation of the powerhouse at minimum flow levels.

To satisfy the minimum intragravel dissolved oxygen (DO) level of 6.0 mg/L, minimum powerhouse generation (approximately 23 MW from one unit) provides approximately 800 cfs flow in the tailrace from December 1 to April 1 each year as tailrace protection flows for Chinook salmon incubation. Based on rigorous study, the powerhouse is limited to 3 hours off and 1 hour on during any 4-hour period during the Chinook salmon incubation period in the event that generation is curtailed to improve lake refill conditions. Minimum tailrace flows are not necessary in the tailrace during the Steelhead Trout incubation period because no Steelhead Trout have been observed spawning in the tailrace. All Steelhead Trout spawning occurs in the Chelan River Habitat Channel.

The success of spawning and incubation through emergence is monitored and evaluated pursuant to license reporting requirements.

*2.4.2. Water Quality*

Criterion	Standard	Instructions
B	2	Agency Recommendation: <ul style="list-style-type: none"> <li>• If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation.</li> <li>• Provide a copy of the most recent Water Quality Certificate, including the date of issuance.</li> <li>• Identify any other agency recommendations related to water quality and explain their scientific or technical basis.</li> <li>• Describe all compliance activities related to the water quality related agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations.</li> </ul>

A number of criteria were established under the Comprehensive Plan to measure components leading to success in achieving biological objectives, including water quality requirements and standards for egg to fry survival. Other monitoring and evaluation activities include fish surveys and monitoring of benthic macroinvertebrate populations.

Two years of hand excavation studies of egg to emergence survival in tailrace Chinook Salmon redds demonstrated an average survival rate of over 86 percent. The biological objective is an emergence survival of at least 70 percent in the constructed spawning habitat in the tailrace and Habitat Channel. Project operations provide for minimum generation flows during the October – March spawning and incubation period to ensure that favorable survival conditions are maintained in the tailrace. Accumulations of gravel and cobble in the tailrace below the confluence with the high flow channel in Reach 4 were removed in 2014 and 2016 to prevent Chinook salmon constructing redds on high points in the deposition zone that could be subject to dewatering during low Columbia River flows. Chelan PUD will continue to operate the Project to maintain minimum generation flows and manage river bed material at the confluence with the Reach 4 high flow channel as needed.

Another objective is to provide minimum dissolved oxygen levels of 6.0 mg/l in tailrace Chinook salmon redds. This is achieved by maintaining powerhouse flows with one turbine operating at minimum generation flows (approximately 800 cfs) throughout the spawning and incubation period.

Reports and compliance information for flows in the tailrace can be found [here](#) under License Articles 405 and 408.

#### 2.4.3 Upstream Fish Passage

Criterion	Standard	Instructions
C	2	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent).</li> <li>• Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.</li> <li>• Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.</li> </ul>

Zone 4 provides anadromous fish spawning habitat for fish migrating up the Columbia River. Anadromous fish do not migrate upstream via Reach 4 of the Chelan River.

Anadromous migratory species observed in the tailrace include the following: Steelhead/Rainbow Trout (*Oncorhynchus mykiss*); and Chinook salmon (*O. tshawytscha*). Other species that are likely making migrations into, and out of, the tailrace are: Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*); Northern pikeminnow (*Ptychocheilus oregonensis*); and suckers (*Catostomus sp.*).

Both NMFS and USFWS reserved their Section 18 fishway prescription authority during the Lake Chelan Project relicensing process. However, neither Service required fish passage at the

dam because they acknowledged the data that anadromous fish, such as ESA-listed Steelhead Trout, penetration to the dam is precluded by impassible barriers in Reach 3 of the Chelan River under current conditions. Additionally, the Services recognized existing data demonstrating that anadromous salmonids never have had access to Lake Chelan due to impassible barriers in the Chelan River.

*2.4.4 Downstream Fish Passage*

Criterion	Standard	Instructions
D	1	<p>Not Applicable / De Minimis Effect:</p> <ul style="list-style-type: none"> <li>• Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines).</li> <li>• For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles.</li> <li>• Document available fish distribution data and the lack of migratory fish species in the vicinity.</li> <li>• If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.</li> </ul>

Zone 4 is the Project tailrace, which naturally feeds into the Columbia River. The Project tailrace provides spawning habitat for Chinook salmon.

Documentation of minimum generation flows have been provided for Chinook salmon spawning and incubation as provided in the [monthly and quarterly flow and temperature reports](#) - see Article 405(a) for annual reports and Monthly/Quarterly Flow/Temp Reports).

*2.4.5 Watershed and Shoreline Protection*

Criterion	Standard	Instructions
E	2	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Shoreline management issues, specifically erosion, are discussed under Zone 1. There are no agency recommendations for shoreline management specific to the Project tailrace. Property in the tailrace is owned by Chelan PUD. The Chelan River Habitat Channel and tailrace are influenced by high spills flows in the Chelan River that are required for lake level control. A

primary goal of the CRBEIP is to minimize high spill levels in the Chelan River in excess of 6,000 cfs. High spill levels have the potential for causing excessive gravel deposition in the tailrace.

*2.4.6 Threatened and Endangered Species Protection*

Criterion	Standard	Instructions
F	3	<p>Recovery Planning and Action:</p> <ul style="list-style-type: none"> <li>• If listed species are present, document that the facility is in compliance with relevant conditions in the species recovery plans, incidental take permits or statements, biological opinions, habitat conservation plans, or similar government documents.</li> <li>• Document that any incidental take permits and/or biological opinions currently in effect were designed as long-term solutions for protection of listed species in the area.</li> </ul>

Federal ESA-listed species that may inhabit, or be located in the vicinity of, the Chelan River tailrace are Upper Columbia River spring-run Chinook salmon (Endangered); Upper Columbia River Steelhead Trout (Threatened); Bull Trout (Threatened) and Ute ladies-tresses (Threatened).

The NMFS concluded in its [Biological Opinion](#) (BiOp) that the proposed action is not likely to jeopardize the continued existence of Upper Columbia River (UCR) spring-run Chinook salmon, UCR steelhead, or other Endangered Species Act (ESA)–listed species in the Columbia, Snake or Willamette rivers under NMFS jurisdiction. NMFS also concluded that the proposed action is not likely to result in destruction or adverse modification of any designated critical habitat for these species. As required by Section 7 of the ESA, NMFS also prepared an incidental take statement (ITS) with the BiOp. The ITS describes reasonable and prudent measures NMFS considered necessary or appropriate to minimize incidental take associated with relicensing the Project. The BiOp includes also the results of NMFS consultation regarding the action’s likely effects on essential fish habitats (EFH) pursuant to Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act.

In the [Mid-Columbia Recovery Unit Implementation Plan \(RUIP\) for Bull Trout](#), the Lake Chelan basin is described as a historic core area because it is currently unoccupied and bull trout are extirpated from the basin. According to the RUIP, the basin does retain the potential for restoration of native fish assemblages, and because of its cold waters, it may provide refuge as climate change progresses, and the short section of the lower Chelan River (Reach 4) is considered bull trout foraging, migration, and overwintering (FMO) habitat. As described in the [Final Biological Objectives Status Report](#), snorkel surveys conducted by Chelan PUD have documented bull trout presence in the Chelan River Habitat Channel and Project tailrace. The Lake Chelan license does not contain requirements specific to bull trout. The USFWS determined that construction of the Chelan River Habitat Channel and year round minimum instream flows to the Chelan River Reach 4 would provide increased foraging, migration and overwintering habitat for bull trout.

Ute Ladies'-tresses have not been observed in the Chelan River Habitat Channel. Populations of this species occur along the shoreline of the Columbia River upstream of the confluence of the Chelan and Columbia rivers and are not affected by Lake Chelan Project operations.

On October 10, 2003, FERC issued its [Final Environmental Assessment](#) (FEA), which examined the effects of the preferred alternative, and the concurrent determinations did not change as a result of this examination. The FEA concluded that relicensing the Lake Chelan Project as proposed in the Comprehensive Settlement Agreement, including FERC recommended measures, would not likely affect Upper Columbia River spring-run Chinook salmon, bull trout, or Ute ladies'-tresses. FERC did determine that Upper Columbia River Steelhead Trout would likely be adversely affected, but only during construction related to habitat improvements in the Chelan River Habitat Channel; those habitat improvements were completed in 2009. FERC asked USFWS for concurrence twice (in a letter dated November 29, 2002 and [a letter dated December 2, 2003](#)). On December 24, 2003, the USFWS wrote a letter that “concur with the commission’s determination that the proposed relicensing may affect, but is not likely to adversely affect the bald eagle, Ute ladies’-tresses, and bull trout.”

State sensitive species or species of concern that may inhabit, or be located in the vicinity of, the project tailrace include Pygmy Whitefish (Sensitive); Upper Columbia River spring-run Chinook salmon (Candidate); Upper Columbia River Steelhead Trout (Candidate) and Bull Trout (Candidate). Pygmy Whitefish do occur in the Lake Chelan Basin, but have been documented to inhabit only Lake Chelan. This species does occur in the Columbia River, but has not been observed in any section of the Chelan River or tailrace. See the [Washington State Status Report for the Pygmy Whitefish](#).

Suitable spawning habitat for Chinook salmon was created in the tailrace in 2008, and was colonized immediately by Chinook salmon in the first year following construction. Extensive use by Chinook salmon has continued to date. Full achievement of biological objective in Zone 4 has been documented through spawning ground redd counts, which show use by Chinook salmon has increased since the construction of this habitat. Since gravel placement in the tailrace and the construction in Reach 4 of the Habitat Channel, the combined Chinook salmon redd counts in the tailrace, in the Habitat Channel and in the Columbia River below the confluence have increased. Prior to 2008, the highest redd count was 253. The annual redd counts have increased from an average of 160 redds per year (1998 – 2007) to an average of over 400 redds per year since 2008 when the additional tailrace habitat was constructed.

Reports and compliance information for flows in the Reach 4 and Project tailrace can be found [here](#) under License Articles 405 and 408.

*2.4.7. Cultural and Historic Resources Protection*

Criterion	Standard	Instructions
G	2	<p>Approved Plan:</p> <ul style="list-style-type: none"> <li>• Provide documentation of all approved state, provincial, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility.</li> <li>• Document that the facility is in compliance with all such plans.</li> </ul>

To protect cultural resources, Chelan PUD is implementing a Historic Properties Management Plan (HPMP) and programmatic agreement with the Commission, the State Historic Preservation Officer, and the Confederated Tribes of the Colville Reservation Tribal Historic Preservation Officer. Cultural resources issues are discussed under Zone 1.

The [Lake Chelan Historic Properties Management Plan \(HPMP\)](#) is part of the Comprehensive Settlement Agreement. Monitoring reports and other compliance information related to the HPMP can be found under License Article 410 and Settlement Agreement Article 10.

*2.4.8 Recreational Resources*

Criterion	Standard	Instructions
H	1	The facility does not occupy lands or waters to which the public can be granted access and does not otherwise impact recreational opportunities in the vicinity of the facility.

There are no recreation facilities associated with the Lake Chelan Project in Zone 4. Lake Chelan Project recreational facilities are discussed under Zone 1 and Zone 2. However, Chelan PUD does own and maintain the 53-acre Chelan Falls Powerhouse Park, which is in the vicinity of Zone 4, under its Rocky Reach Hydroelectric Project license (P-2145).

## Part 3. Contact Forms

**1. All applications for LIHI Certification must include complete contact information to be reviewed.**

<b>Project Owner</b>	
Company	Public Utility District No. 1 of Chelan County
Mailing Address	327 N. Wenatchee Ave. P.O. Box 1231 Wenatchee, WA 98807
Contact Name	Suzanne Grassell
Contact Phone	(509) 661-4177
Contact Email Address	<a href="mailto:Suzanne.grassell@chelanpud.org">Suzanne.grassell@chelanpud.org</a>
Contact Mailing Address	327 N. Wenatchee Ave. P.O. Box 1231 Wenatchee, WA 98807
Project Operator (if different from Owner)	N/A
<b>Consulting Firm/Agent for LIHI Program (if different from above)</b>	
Name and Title	N/A
Company	
Phone	
Email Address	
Mailing Address	
<b>Compliance Contact (responsible for LIHI Program requirements):</b>	
Name and Title	Michelle Smith
Company	Chelan County PUD
Phone	(509) 661-4180
Email Address	<a href="mailto:Michelle.smith@chelanpud.org">Michelle.smith@chelanpud.org</a>
Mailing Address	327 N. Wenatchee Ave. P.O. Box 1231 Wenatchee, WA 98807

**2. Applicant must identify the most current and relevant state, federal, provincial, and tribal resource agency contacts (copy and repeat the following table as needed).**

**Federal Agencies**

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Name and Title	Hugh Anthony
Company	National Park Service
Phone	(360) 854-7324
Email Address	<a href="mailto:hugh_anthony@nps.gov">hugh_anthony@nps.gov</a>
Mailing Address	2105 State Route 20 Sedro-Woolley, WA 98284-1799

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Name and Title	Ashley Rawhouser
Company	National Park Service North Cascades National Park
Phone	(360) 854 – 7317
Email Address	<a href="mailto:Ashley_rawhouser@nps.gov">Ashley_rawhouser@nps.gov</a>
Mailing Address	2105 W. Alder Street Union Gap, WA 98903

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Name and Title	Kari Grover Wier – District Ranger
Company	U.S. Forest Service
Phone	(509) 682-4900
Email Address	<a href="mailto:kgrover@fs.fed.us">kgrover@fs.fed.us</a>
Mailing Address	428 West Woodin Avenue Chelan, WA 98816

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Name and Title	Ana Cerro-Timpone
Company	U.S. Forest Service
Phone	(509) 784-1511 x570
Email Address	<a href="mailto:avcerrotimpone@fs.fed.us">avcerrotimpone@fs.fed.us</a>
Mailing Address	2108 Entiat Way Entiat, WA 98822

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Name and Title	Stephen Lewis
Company	U.S. Fish and Wildlife Service
Phone	(509) 665-3508 x14
Email Address	<a href="mailto:Stephen_lewis@fws.gov">Stephen_lewis@fws.gov</a>
Mailing Address	215 Melody Lane, Suite 119 Wenatchee, WA 98801

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Name and Title	Justin Yeager
Company	National Marine Fisheries Service
Phone	(509) 925-2618 x224
Email Address	<a href="mailto:Justin.yeager@noaa.gov">Justin.yeager@noaa.gov</a>
Mailing Address	304 S. Water Street, Suite 201 Ellensburg, WA 98926

### State Agencies

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Name and Title	Travis Maitland
Company	Washington State Department of Fish and Wildlife
Phone	(509) 665-3337
Email Address	<a href="mailto:Travis.maitland@dfw.wa.gov">Travis.maitland@dfw.wa.gov</a>
Mailing Address	3860 State Highway 97A Wenatchee, WA 98801

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Name and Title	Graham Simon
Company	Washington State Department of Fish and Wildlife
Phone	(509) 670-0742
Email Address	<a href="mailto:Graham.simon@dfw.wa.gov">Graham.simon@dfw.wa.gov</a>
Mailing Address	3860 Chelan Hwy N. Wenatchee, WA 98801

Agency Contact (Check area of responsibility: Flows __, Water Quality <u>X</u> , Fish/Wildlife Resources __, Watersheds__, T/E Spp. __, Cultural/Historic Resources __, Recreation__):	
Name and Title	Brean Zimmerman
Company	Washington State Department of Ecology
Phone	(509) 575-2808
Email Address	<a href="mailto:Bzim461@ecy.wa.gov">Bzim461@ecy.wa.gov</a>
Mailing Address	1250 W. Alder Street Union Gap, WA 98903

Agency Contact (Check area of responsibility: Flows __, Water Quality <u>X</u> , Fish/Wildlife Resources __, Watersheds__, T/E Spp. __, Cultural/Historic Resources __, Recreation__):	
Name and Title	Jim Pacheco
Company	Washington State Department of Ecology
Phone	(360) 407-7458
Email Address	<a href="mailto:Jpac461@ecy.wa.gov">Jpac461@ecy.wa.gov</a>
Mailing Address	300 Desmond Dr. SE Lacey, WA 98503

Agency Contact (Check area of responsibility: Flows __, Water Quality <u>X</u> , Fish/Wildlife Resources __, Watersheds__, T/E Spp. __, Cultural/Historic Resources __, Recreation__):	
Name and Title	Mark Peterschmidt
Company	Washington State Department of Ecology
Phone	(509) 454-7843
Email Address	<a href="mailto:Mape461@ecy.wa.gov">Mape461@ecy.wa.gov</a>
Mailing Address	1250 @. Alder Street Union Gap, WA 98903 Lacey, WA 98503

## Tribes

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds__, T/E Spp. __, Cultural/Historic Resources <u>X</u> , Recreation__):	
Name and Title	Guy Moura
Company	Confederated Tribes of the Colville Reservation
Phone	(509) 634-2695
Email Address	<a href="mailto:Guy.moura@colvilletribes.com">Guy.moura@colvilletribes.com</a>
Mailing Address	Rural Route 1, Box 150 Nespelem, WA 99155

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds__, T/E Spp. __, Cultural/Historic Resources <u>X</u> , Recreation__):	
Name and Title	Johnson Meninick
Company	Yakama Nation
Phone	(509) 865-5121 ext737
Email Address	<a href="mailto:johnson@yakama.com">johnson@yakama.com</a>
Mailing Address	PO Box 151 Toppenish, WA 98948

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds__, T/E Spp. __, Cultural/Historic Resources __, Recreation__):	
Name and Title	Chuck Bushwood
Company	Confederated Tribes of the Colville Reservation
Phone	(509) 422 – 7749 or (509) 631-4605
Email Address	<a href="mailto:Charles.brushwood@colvilletribes.com">Charles.brushwood@colvilletribes.com</a>
Mailing Address	P.O. Box 150 Nespelem, WA 99155

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds__, T/E Spp. __, Cultural/Historic Resources __, Recreation__):	
Name and Title	Bob Rose
Company	Confederated Tribes and Bands of the Yakama Nation
Phone	(509) 945-0141
Email Address	<a href="mailto:rosb@yakamafish-nsn.gov">rosb@yakamafish-nsn.gov</a>
Mailing Address	PO Box 151 Toppenish, WA 98948

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds__, T/E Spp. __, Cultural/Historic Resources __, Recreation__):	
Name and Title	Paul Ward
Company	Confederated Tribes and Bands of the Yakama Nation
Phone	(509) 949-4129
Email Address	<a href="mailto:warp@yakamafish-nsn.gov">warp@yakamafish-nsn.gov</a>
Mailing Address	PO Box 151 Toppenish, WA 98948

**Local Governments**

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Name and Title	Mike Cooney - Mayor
Company	City of Chelan
Phone	(509) 682-8018
Email Address	<a href="mailto:mccooney@cityofchelan.us">mccooney@cityofchelan.us</a>
Mailing Address	PO Box 1669 Chelan, WA 98816

**Local Non-Governmental Stakeholders**

Local Non-Governmental Stakeholder (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Name and Title	Phil Archibald
Company	Fisheries Scientist
Phone	(509) 784-2471
Email Address	<a href="mailto:Kim.l.lohse@gmail.com">Kim.l.lohse@gmail.com</a>
Mailing Address	PO Box 476 Entiat, WA 98822

**Chelan River Fishery Forum**

Name	Agency
Hugh Anthony	National Park Service
Ashley Rawhouser	National Park Service
Ana Cerro-Timpone	USDA Forest Service
Kari Grover-Wier	USDA Forest Service
Paul Willard	USDA Forest Service
Travis Maitland	Washington Department of Fish and Wildlife
Graham Simon	Washington Department of Fish and Wildlife
Justin Yeager	National Marine Fisheries Service
Steve Lewis	U.S. Fish and Wildlife Service
Breean Zimmerman	Washington Department of Ecology
Mark Peterschmidt	Washington Department of Ecology
Jim Pacheco	Washington Department of Ecology
Bob Rose	Yakama Nation
Chuck Brushwood	Colville Confederated Tribes
Phil Archibald	Interested Citizen
Mike Cooney	City of Chelan
Bill Towey	Chelan PUD
Scott Hopkins	Chelan PUD
Marcie Clement	Chelan PUD
Catherine Willard	Chelan PUD
Michelle Smith	Chelan PUD
Jeff Osborn	Chelan PUD

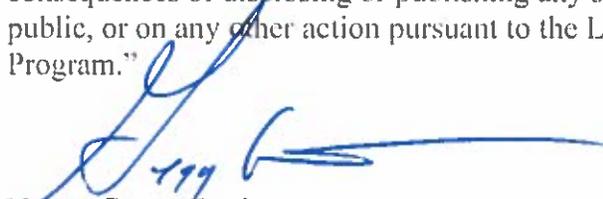
## Part 4. Sworn Statement and Waiver of Liability

**All applications for LIHI Certification must include the following sworn statement before they can be reviewed by LIHI:**

I declare that I am an authorized officer of the Applicant and am duly authorized to make this Application on behalf of the Public Utility District No. 1 of Chelan County. I declare that, to the best of my knowledge and belief, the material presented in the application is true and complete. The primary goal of the Low Impact Hydropower Institute's Certification Program is public benefit. The Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The undersigned Applicant understands that if Certification of the applying facility is issued, the LIHI Certification Mark License Agreement (CMLA) must be signed prior to marketing the electricity product as LIHI Certified.

The undersigned Applicant agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's Certification Program."



Name: Gregg Carrington

Title: Managing Director, Energy Planning and Resources

Date: August 29, 2018

## Part 5: References

### Article 1 - FERC License Order

- January 23, 2018 – [FERC Order](#) amending the license to change flow in the Habitat Channel
- December 7, 2017 – [FERC Order](#) amending the license to change flow in the Habitat Channel
- November 3, 2017 – [Amended Water Quality Certificate](#) to change flow in the Habitat Channel
- October 10, 2012 – [FERC Order amending license](#) to incorporated amended water quality certification
- August 28, 2012 – [Re-amended Section 401 Water Quality Certification](#), increased hydraulic capacity
- February 20, 2009 - [FERC Order Amending License](#), modification
- November 19, 2008 - [Amended Section 401 Water Quality Certification](#), increased hydraulic capacity
- April 19, 2007 - [Order on Rehearing](#)
- November 06, 2006 - [FERC License Order](#), new License
- September 21, 2006 - [FERC Policy Statement on Hydropower Licensing Settlements](#)
- September 28, 2005 - [Programmatic Agreement](#)
- June 01, 2004 - [Section 401 Water Quality Certification](#)
- October 08, 2003 - [Settlement Agreement](#)

### Article 403 - Stehekin Area Implementation Monitoring Plan

- April 26, 2017 - [2016 Annual Report and 2017 Work Plan](#), submittal to FERC
- April 25, 2016 - [2015 Annual Report and 2016 Work Plan](#), submittal to FERC
- April 22, 2015 - [2014 Annual Report and 2015 Work Plan](#), submittal to FERC
- April 30, 2014 - [2013 Annual Report and 2014 Work Plan](#), submittal to FERC
- April 30, 2013 - [2012 Annual Report and 213 Work Plan](#), submittal to FERC
- April 06, 2012 - [2011 Annual Report and 2012 Work Plan](#), submittal to FERC
- April 29, 2011 - [2010 Annual Report and 2011 Work Plan](#), submittal to FERC
- April 08, 2010 - [2009 Annual Report and 2010 Work Plan](#), submittal to FERC
- September 15, 2009 - [2008 Annual Report and 2009 Work Plan](#), acknowledgement of receipt from FERC
- March 25, 2009 - [2008 Annual Report and 2009 Work Plan](#), submittal to FERC
- May 06, 2008 - [Stehekin Area Implementation Monitoring Plan](#), order modifying and approval from FERC
- November 06, 2007 - [Stehekin Area Implementation Monitoring Plan](#), submittal to FERC

### Article 403(c) - Stehekin Area Dust Emissions 5-Year Plan

- January 11, 2012 - [Stehekin Area Dust Emissions 5-year Report](#), approval from FERC
- November 03, 2011 - [Stehekin Area Dust Emissions 5-year Report](#), submittal to FERC

### Article 403(d) - Stehekin Area Riparian Zone Plan

- December 22, 2017 - [Time Extension for 2017 Technical Report and Revised Schedule for Future Reports](#), submittal to FERC
- December 31, 2014 - [2014 Technical Report-Stehekin Riparian Zone Plan](#), submittal to FERC
- August 02, 2011 - [Stehekin Riparian Zone Plan](#), approval from FERC
- November 01, 2010 - [Stehekin Riparian Zone Plan](#), submittal to FERC
- November 20, 2009 - [Riparian Zone Action Plan](#), order granting extension of time from FERC
- August 13, 2009 - [Riparian Zone Action Plan](#), time extension request submittal to FERC

## Article 404 - Lake Chelan Fishery Plan

- February 27, 2017 - [2017 Annual Work Plan](#), submittal to Lake Chelan Fishery Forum
- April 01, 2016 - [2016 Annual Work Plan](#), submittal to Lake Chelan Fishery Forum
- April 02, 2015 - [2015 Annual Work Plan](#), submittal to Lake Chelan Fishery Forum
- February 20, 2014 - [2014 Annual Work Plan](#), submittal to Lake Chelan Fishery Forum
- May 15, 2013 - [2013 Annual Work Plan](#), submittal to FERC
- May 10, 2012 - [2012 Annual Work Plan](#), submittal to FERC
- June 30, 2011 - [2011 Annual Work Plan](#), acknowledgement of receipt from FERC
- June 01, 2011 - [2011 Annual Work Plan](#), submittal to FERC
- July 22, 2010 - [2010 Annual Work Plan](#), acknowledgement of receipt from FERC
- May 27, 2010 - [2010 Annual Work Plan](#), submittal to FERC
- March 26, 2009 - [2009 Annual Work Plan](#), acknowledgement of receipt from FERC
- February 17, 2009 - [2009 Annual Work Plan](#), submittal to FERC
- April 28, 2008 - [2008 Annual Work Plan](#), acknowledgement of receipt from FERC
- April 17, 2008 - [2008 Annual Work Plan](#), submittal to FERC 2008
- December 04, 2007 - [Lake Chelan Fishery Plan](#), order modifying and approval from FERC
- November 06, 2007 - [Lake Chelan Fishery Plan](#), submittal to FERC

## Article 404(a) - Tributary Barrier Removal

- June 01, 2016 - [2008-2016 Tributary Barriers Photographs](#)
- June 30, 2014 - [2014 Tributary Mouth Photographs](#)
- March 01, 2013 - [2013 Tributary Barriers Photographs](#)
- May 25, 2011 - [2011 Tributary Barriers Photographs](#)
- August 20, 2009 - [Lake Chelan Tributary Passage Final Design](#)
- June 26, 2009 - [Lake Chelan Tributary Passage Preliminary Design](#)
- April 02, 2009 - [Lake Chelan Tributary Field Trip](#)
- February 01, 2009 - [2009 Tributary Mouth Photographs](#)
- September 24, 2008 - [Chelan Ranger District Large Fire History 2000-2007](#)
- July 28, 2008 - [Little Creek Photos](#)
- March 01, 2008 - [2008 Tributary Barriers Photographs](#)

## Article 404(b) - Fish Stocking Plan

- May 30, 2017 - [2016 Fish Stocking Report](#), submittal to FERC
- May 25, 2016 - [2015 Fish Stocking Report](#), submittal to FERC
- May 29, 2015 - [2014 Fish Stocking Report](#), submittal to FERC
- May 30, 2014 - [2013 Fish Stocking Report](#), submittal to FERC
- May 15, 2013 - [2012 Fish Stocking Report](#), submittal to FERC
- May 10, 2012 - [2011 Fish Stocking Report](#), submittal to FERC
- June 01, 2011 - [2011 Fish Stocking Report](#), submittal to FERC
- May 27, 2010 - [2009 Fish Stocking Report](#), submittal to FERC
- February 17, 2009 - [2008 Fish Stocking Report](#), submittal to FERC
- April 17, 2008 - [2007 Fish Stocking Report](#), submittal to FERC

## Article 405 - Operations Compliance Monitoring Plan

- November 30, 2007 - [Operations Compliance Monitoring Plan](#), order modifying and approval from FERC

- May 04, 2007 - [Operations Compliance Monitoring Plan](#), submittal to FERC

## Article 405(a) Annual Flow/Temp Report

- May 31, 2017 - [2016 Annual Flow and Water Temperature Report](#), submittal to FERC
- February 16, 2017 - [2016 Annual Flow and Water Temperature Report](#), request for time extension
- June 15, 2016 - [2015 Annual Flow and Water Temperature Report \(including the Water Quality Assessment\)](#), submittal to FERC
- April 22, 2015 - [2014 Annual Flow and Water Temperature Report](#), submittal to FERC
- April 30, 2014 - [2013 Annual Flow and Water Temperature Report](#), submittal to FERC
- April 30, 2013 - [2012 Annual Flow and Water Temperature Report](#), submittal to FERC
- March 28, 2012 - [2011 Annual Flow and Temperature Report](#), submittal to FERC
- March 28, 2012 - [2011 Annual Flow and Water Temperature Report](#), submittal to FERC
- February 24, 2012 - [2011 Annual Flow and Water Temperature Report](#), time extension request granted
- February 03, 2012 - [2011 Annual Flow and Water Temperature Report](#), request for time extension
- February 28, 2011 - [2010 Annual Flow and Water Temperature Report](#), submittal to FERC
- February 26, 2010 - [2009 Annual Flow Report](#), submittal to FERC
- March 26, 2009 - [2008 Annual Flow Report](#), acknowledgement of receipt from FERC
- February 27, 2009 - [2008 Annual Flow Report](#), submittal to FERC
- April 16, 2008 - [2007 Annual Flow Report](#), acknowledgement of receipt from FERC
- February 28, 2008 - [2007 Annual Flow Report](#), submittal to FERC

## Article 405(a) Flow/Ramping Rates/Violations

- March 29, 2017 - [Minimum Instream Flow Deviation Report \(December 5, 2016\)](#), FERC's response to Deviation report (December 5, 2016)
- February 08, 2017 - [Minimum Instream Flow Deviation Report \(December 5, 2016\)](#), submittal to FERC
- August 26, 2014 - [Ramping Rate Deviation \(June 10, 2014\)](#), FERC's response to deviation report
- July 14, 2014 - [Ramping Rate Deviation Report \(June 10, 2014\)](#), submittal to FERC
- September 19, 2013 - [Ramping Rate Deviation Report \(May 2, 2013\)](#), FERC's acknowledgement filing fulfills reporting requirements
- July 26, 2013 - [Minimum Flow and Ramping Rate Deviation Report \(March 18, 2013\)](#), FERC's acknowledgement filing fulfills reporting requirements
- June 03, 2013 - [Ramping Rate Deviation Report \(May 2, 2013\)](#), submittal to FERC
- April 18, 2013 - [Minimum Flow and Ramping Rate Deviation Report \(March 18, 2013\)](#), submittal to FERC
- February 4, 2013 - [Ramping Rate Deviation \(November 5, 2012\)](#), response from FERC
- December 5, 2012 - [Ramping Rate Deviation Report \(November 5, 2012\)](#), submittal to FERC
- October 21, 2011 - [Minimum Flow and Ramping Rate Deviations \(May 15 and 17, 2011\)](#), response from FERC
- September 29, 2011 - [Minimum Flow and Ramping Rate Deviation \(May 1 and June 1, 2011\)](#), response from FERC
- September 28, 2011 - [Minimum Flow and Ramping Rate Deviation \(April 18, 2011\)](#), response from FERC
- June 16, 2011 - [Minimum Flow and Ramping Rate Deviation Report \(May 15 and 17, 2011\)](#), submittal to FERC
- May 19, 2011 - [Minimum Flow and Ramping Rate Deviation Notice \(May 15 and 17, 2011\)](#), notification to FERC
- May 19, 2011 - [Minimum Flow and Ramping Rate Deviation Report \(April 18, 2011\)](#), submittal to FERC
- May 18, 2011 - [Minimum Flow and Ramping Rate Deviation \(April 18, 2011\)](#), submittal to FERC
- April 20, 2011 - [Minimum Flow and Ramping Rate Deviation Notice \(April 18, 2011\)](#), Chelan PUD email notification
- July 08, 2010 - [2009 Annual Flow Report](#), acknowledgement of receipt from FERC

- January 14, 2010 - [Minimum Flow Deviation \(October 24 - 26, 2009\)](#), response from FERC
- November 25, 2009 - [Minimum Flow Deviation Report \(October 24-26, 2009\)](#), submittal to FERC
- October 28, 2009 - [Minimum Flow Deviation Notice \(October 24-26, 2009\)](#), notification to FERC

## Article 405(a) Mthly and Quarterly Flow/Temp Reports

- January 12, 2018 - [2017 Hourly and Daily Average Flow Report - 4th Quarter](#)
- October 31, 2017 - [2017 Hourly and Daily Average Flow Report -3rd Quarter](#)
- October 31, 2017 - [2017 Hourly and Daily Average Temperature Report - 3rd Quarter and September](#)
- September 29, 2017 - [2017 Hourly and Daily Average Temperature Report - August](#)
- August 30, 2017 - [2017 Hourly and Daily Average Temperature Report - July](#)
- July 31, 2017 - [2017 Hourly and Daily Average Temperature Report - 2nd Quarter](#)
- July 25, 2017 - [2017 Hourly and Daily Average Flow Report - 2nd Quarter](#)
- May 08, 2017 - [2017 UPDATED Hourly and Daily Average Temperature Report - 1st Quarter](#)
- April 27, 2017 - [2016 Hourly and Daily Average Temperature Report - 4th Quarter](#)
- April 27, 2017 - [2017 Hourly and Daily Average Flow Report - 1st Quarter](#)
- April 27, 2017 - [2017 Hourly and Daily Average Temperature Report - 1st Quarter](#)
- January 31, 2017 - [2016 Hourly and Daily Average Flow Report - 4th Quarter](#)
- January 31, 2017 - [2016 Hourly and Daily Average Temperature Report \(Low Level Outlet\) - 4th Quarter](#)
- October 14, 2016 - [2016 Hourly and Daily Average Temperature Report - 3rd Quarter](#)
- October 13, 2016 - [2016 Hourly and Daily Average Flow Report - 3rd Quarter](#)
- September 09, 2016 - [2016 Hourly and Daily Average Flow Report - August](#)
- September 06, 2016 - [2016 UPDATED Hourly and Daily Average Temperature Report - 1st Quarter, 2nd Quarter and July](#)
- August 30, 2016 - [2016 Hourly and Daily Average Flow Report - July](#)
- August 29, 2016 - [2016 Hourly and Daily Average Temperature Report - July-August](#)
- August 16, 2016 - [2016 Hourly and Daily Average Temperature Report - 1st Quarter Update and 2nd Quarter](#)
- August 15, 2016 - [2016 Hourly and Daily Average Flow Report - 2nd Quarter](#)
- April 28, 2016 - [2016 Hourly and Daily Average Temperature Report - 1st Quarter](#)
- April 27, 2016 - [2016 Hourly and Daily Average Flow Report - 1st Quarter](#)
- April 07, 2016 - [2015 Hourly and Daily Average Temperature Report - 4th Quarter](#)
- January 29, 2016 - [2015 Hourly and Daily Average Flow Report - 4th Quarter](#)
- October 30, 2015 - [2015 Hourly and Daily Average Flow Report - 3rd Quarter](#)
- October 30, 2015 - [2015 Hourly and Daily Average Temperature Report - 3rd Quarter](#)
- September 30, 2015 - [2015 Hourly and Daily Average Temperature Report -July-August](#)
- August 21, 2015 - [2015 Hourly and Daily Average Temperature Report - July](#)
- July 31, 2015 - [2015 Hourly and Daily Average Flow Report - 2nd Quarter](#)
- July 31, 2015 - [2015 Hourly and Daily Average Temperature Report - 2nd Quarter](#)
- April 30, 2015 - [2015 Hourly and Daily Average Flow Report - 1st Quarter](#)
- April 30, 2015 - [2015 Hourly and Daily Average Temperature Report - 1st Quarter](#)
- February 26, 2015 - [2014 Hourly and Daily Average Temperature Report - 4th Quarter](#)
- January 30, 2015 - [2014 Hourly and Daily Average Flow Report - 4th Quarter](#)
- October 31, 2014 - [2014 Chelan River Daily and Hourly Average Temperature Report - 3rd Quarter](#)
- October 31, 2014 - [2014 Hourly and Daily Average Flow Report - 3rd Quarter](#)
- September 04, 2014 - [2014 Chelan River Daily Average Temperature Report - 2nd Quarter](#)
- September 04, 2014 - [2014 Chelan River Daily Average Temperature Report - July](#)
- September 04, 2014 - [2014 Chelan River Hourly Temperature Report - 2nd Quarter](#)
- September 04, 2014 - [2014 Chelan River Hourly Temperature Report - July](#)
- July 24, 2014 - [2014 Daily Average Flow Report - 2nd Quarter](#)
- July 24, 2014 - [2014 Hourly Flow Report - 2nd Quarter](#)
- April 29, 2014 - [2014 Chelan River Daily Temperature Report - 1st Quarter](#)

- April 29, 2014 - [2014 Chelan River Hourly Temperature Report - 1st Quarter](#)
- April 29, 2014 - [2014 Daily Average Flow Report - 1st Quarter](#)
- April 29, 2014 - [2014 Hourly Flow Report - 1st Quarter](#)
- November 01, 2013 - [2013 Chelan River Daily Temperature Report - 3rd Quarter](#)
- November 01, 2013 - [2013 Chelan River Hourly Temperature Report - 3rd Quarter](#)
- November 01, 2013 - [2013 Daily Flow Report - 3rd Quarter](#)
- November 01, 2013 - [2013 Hourly Flow Report - 3rd Quarter](#)
- July 25, 2013 - [2013 Chelan River Daily Temperature Report - 2nd Quarter](#)
- July 25, 2013 - [2013 Chelan River Hourly Temperature Report - 2nd Quarter](#)
- July 25, 2013 - [2013 Daily Flow Report - 2nd Quarter](#)
- May 20, 2013 - [Chelan River Water Temperature Excel Database](#)
- May 01, 2013 - [2013 Chelan River Daily Temperature Report - 1st Quarter](#)
- May 01, 2013 - [2013 Chelan River Hourly Temperature Report - 1st Quarter](#)
- May 01, 2013 - [2013 Daily Flow Report - 1st Quarter](#)
- May 01, 2013 - [2013 Hourly Flow Report - 1st Quarter](#)
- December 31, 2012 - [2012 Chelan River Daily Temperature Report - 4th Quarter](#)
- December 31, 2012 - [2012 Chelan River Hourly Temperature Report - 4th Quarter](#)
- December 31, 2012 - [2012 Daily Flow Report - 4th Quarter](#)
- December 31, 2012 - [2012 Hourly Flow Report - 4th Quarter](#)
- September 28, 2012 - [2012 Chelan River Daily Temperature Report - 3rd Quarter](#)
- September 28, 2012 - [2012 Chelan River Hourly Temperature Report - 3rd Quarter](#)
- September 28, 2012 - [2012 Daily Flow Report - 3rd Quarter](#)
- September 28, 2012 - [2012 Hourly Flow Report - 3rd Quarter](#)
- June 29, 2012 - [2012 Chelan River Daily Temperature Report - 2nd Quarter](#)
- June 29, 2012 - [2012 Chelan River Hourly Temperature Report - 2nd Quarter](#)
- June 29, 2012 - [2012 Daily Flow Report - 2nd Quarter](#)
- June 29, 2012 - [2012 Hourly Flow Report - 2nd Quarter](#)
- March 30, 2012 - [2012 Chelan River Daily Temperature Report - 1st Quarter](#)
- March 30, 2012 - [2012 Chelan River Hourly Temperature Report - 1st Quarter](#)
- March 30, 2012 - [2012 Daily Flow Report - 1st Quarter](#)
- March 30, 2012 - [2012 Hourly Flow Report - 1st Quarter](#)
- February 15, 2012 - [2011 Chelan River Daily and Hourly Temperature Report - 2011 September, 3rd Quarter, and 4th Quarter](#)
- February 01, 2012 - [2011 4th Quarter Hourly and Daily Flow Report](#)
- October 31, 2011 - [2011 3rd Quarter Daily Flow Report](#)
- October 31, 2011 - [2011 3rd Quarter Hourly Flow Report](#)
- September 30, 2011 - [2011 Chelan River Daily Temperature Report - August](#)
- September 30, 2011 - [2011 Chelan River Hourly Temperature Report - August](#)
- July 31, 2011 - [2011 Chelan River Daily Temperature Report - July](#)
- July 31, 2011 - [2011 Chelan River Hourly Temperature Report - July](#)
- June 30, 2011 - [2011 2nd Quarter Daily Flow Report](#)
- June 30, 2011 - [2011 2nd Quarter Hourly Flow Report](#)
- June 30, 2011 - [2011 Chelan River Daily Temperature Report - 2nd Quarter](#)
- June 30, 2011 - [2011 Chelan River Hourly Temperature Report - 2nd Quarter](#)
- April 22, 2011 - [2011 1st Quarter Daily Flow Report](#)
- April 22, 2011 - [2011 1st Quarter Hourly Flow Report](#)
- April 22, 2011 - [2011 Chelan River Daily Temperature Report - 1st Quarter](#)
- April 22, 2011 - [2011 Chelan River Hourly Temperature Report - 1st Quarter](#)
- January 31, 2011 - [2010 4th Quarter Daily Flow Report](#)
- January 31, 2011 - [2010 4th Quarter Hourly Flow Report](#)
- October 29, 2010 - [2010 3rd Quarter Daily Flow Report](#)
- October 29, 2010 - [2010 3rd Quarter Hourly Flow Report](#)

- October 29, 2010 - [2010 Chelan River Daily Temperature Report - 3rd Quarter](#)
- October 29, 2010 - [2010 Chelan River Daily Temperature Report - September](#)
- October 29, 2010 - [2010 Chelan River Hourly Temperature Report - 3rd Quarter](#)
- October 29, 2010 - [2010 Chelan River Hourly Temperature Report - September](#)
- September 30, 2010 - [2010 Chelan River Daily Temperature Report - August](#)
- September 30, 2010 - [2010 Chelan River Hourly Temperature Report - August](#)
- August 31, 2010 - [2010 Chelan River Daily Temperature Report - July](#)
- August 31, 2010 - [2010 Chelan River Hourly Temperature Report - July](#)
- July 30, 2010 - [2010 Chelan River Daily Temperature Report-2nd Quarter](#)
- July 30, 2010 - [2010 Chelan River Hourly Temperature Report-2nd Quarter](#)
- July 29, 2010 - [2010 2nd Quarter Daily Flow Report](#)
- July 29, 2010 - [2010 2nd Quarter Hourly Flow Report](#)
- April 28, 2010 - [2010 1st Quarter Daily Flow Report](#)
- April 28, 2010 - [2010 1st Quarter Hourly Flow Report](#)
- March 31, 2010 - [2010 Chelan River Daily Temperature Report-1st Quarter](#)
- March 31, 2010 - [2010 Chelan River Hourly Temperature Report-1st Quarter](#)
- January 29, 2010 - [2009 4th Quarter Daily Flow Report](#)
- January 29, 2010 - [2009 4th Quarter Hourly Flow Report](#)
- December 31, 2009 - [2009 Chelan River Daily Temperature Report-4th Quarter](#)
- December 31, 2009 - [2009 Chelan River Hourly Temperature Report-4th Quarter](#)
- October 30, 2009 - [2009 3rd Quarter Daily Flow Report](#)
- October 30, 2009 - [2009 3rd Quarter Hourly Flow Report](#)
- July 31, 2009 - [2009 2nd Quarterly Daily Flow Report](#)
- July 31, 2009 - [2009 2nd Quarterly Hourly Flow Report](#)
- March 31, 2009 - [2009 1st Quarterly Daily Flow Report](#)
- March 31, 2009 - [2009 1st Quarterly Hourly Flow Report](#)
- January 30, 2009 - [2008 4th Quarterly Daily Flow Report](#)
- January 30, 2009 - [2008 4th Quarterly Hourly Flow Report](#)
- September 30, 2008 - [2008 3rd Quarterly Daily Flow Report](#)
- September 30, 2008 - [2008 3rd Quarterly Hourly Report](#)
- June 30, 2008 - [2008 2nd Quarterly Daily Flow Report](#)
- June 30, 2008 - [2008 2nd Quarterly Hourly Flow Report](#)
- May 02, 2008 - [2008 1st Quarterly Daily Flow Report](#)
- February 28, 2008 - [2007 Annual Flow Report Hourly Data](#)
- June 06, 2005 - [Water Temperature Profile Study Results](#)
- July 23, 2004 - [Water Temperature Profile Study Plan](#)

## Article 405(b) - Annual Lake Level Report

- February 28, 2017 - [2016 Annual Lake Level Report](#), submittal to FERC
- February 29, 2016 - [2015 Annual Lake Level Report](#), submittal to FERC
- February 27, 2015 - [2014 Annual Lake Level Report](#), submittal to FERC
- February 11, 2014 - [2013 Annual Lake Level Report](#), submittal to FERC
- February 28, 2013 - [2012 Annual Lake Level Report](#), submittal to FERC
- February 28, 2012 - [2011 Annual Lake Level Report](#), submittal to FERC
- September 29, 2011 - [Lake Level Target Deviation \(May 1, 2011 and June 1, 2011\)](#), response from FERC
- June 29, 2011 - [Lake Level Target Deviation Report \(June 1, 2011\)](#), submittal to FERC
- June 02, 2011 - [Lake Level Target Deviation Notice \(June 1, 2011\)](#), notification to FERC
- May 31, 2011 - [Lake Level Target Deviation Report \(May 1, 2011\)](#), submittal to FERC
- May 02, 2011 - [Lake Level Target Deviation Notice \(May 1, 2011\)](#), notification to FERC
- April 21, 2011 - [2010 Annual Lake Level Report](#), acknowledgement of receipt from FERC

- February 28, 2011 - [2010 Annual Lake Level Report](#), submittal to FERC
- July 08, 2010 - [2009 Annual Lake Level Report](#), acknowledgement of receipt from FERC
- February 25, 2010 - [2009 Annual Lake Level Report](#), submittal to FERC
- March 26, 2009 - [2008 Annual Lake Level Report](#), acknowledgement of receipt from FERC
- February 27, 2009 - [2008 Annual Lake Level Report](#), submittal to FERC
- November 27, 2007 - [2007 Annual Lake Level Report](#), acknowledgement of receipt from FERC
- November 06, 2007 - [2007 Annual Lake Level Report](#), submittal to FERC

## Article 406 - Wildlife Habitat Plan

- April 29, 2016 - [2016 Wildlife Work Plan and 2015 Wildlife Activity Report](#), submittal to FERC
- April 30, 2015 - [2015 Wildlife Work Plan and 2014 Wildlife Activity Report](#), submittal to FERC
- April 30, 2014 - [2014 Wildlife Work Plan and the 2013 Wildlife Activity Report](#), submittal to FERC
- September 18, 2013 - [2013-2017 Wildlife Work Plan and the 2008-2012 Wildlife Habitat Summary Report](#), approval from FERC
- April 10, 2013 - [2013-2017 Wildlife Work Plan and the 2008-2012 Wildlife Habitat Summary Report](#), submittal to FERC
- April 24, 2012 - [2012 Wildlife Work Plan and 2011 Wildlife Activity Report](#), submittal to FERC
- August 29, 2011 - [Lake Chelan Mule Deer and Big Horn Sheep Winter Range Habitat](#), Cascadia Conservation District
- April 29, 2011 - [2011 Wildlife Work Plan and 2010 Wildlife Activity Report](#), submittal to FERC
- June 08, 2010 - [2010 Work Plan and 2009 Wildlife Activity Report](#), acknowledgement of receipt from FERC
- April 30, 2010 - [2010 Wildlife Work Plan and 2009 Wildlife Activity Report](#), submittal to FERC
- October 02, 2009 - [2009 Work Plan and 2008 Wildlife Activity Report](#), acknowledgement of receipt from FERC
- April 27, 2009 - [2009 Work Plan and 2008 Wildlife Activity Report](#), submittal to FERC
- April 10, 2008 - [Wildlife Habitat Plan](#), modifying and approval from FERC
- November 06, 2007 - [Wildlife Habitat Plan](#), submittal to FERC

## Article 406(a) - Annual Wildlife Surveys

- April 29, 2016 - [2015-2016 Winter Wildlife Survey Report](#), submittal to FERC
- April 30, 2015 - [2014-2015 Winter Wildlife Survey Report](#), submittal to FERC
- April 30, 2014 - [2013-2014 Winter Wildlife Survey Report](#), submittal to FERC
- April 30, 2013 - [2012-2013 Winter Wildlife Survey Report](#), submittal to FERC
- April 26, 2012 - [2011-2012 Winter Wildlife Survey Report](#), submittal to FERC
- April 29, 2011 - [2010-2011 Winter Wildlife Survey Report](#), submittal to FERC
- April 30, 2010 - [2009-2010 Winter Wildlife Survey](#), submittal to FERC
- April 30, 2009 - [2008-2009 Winter Wildlife Survey](#), submittal to FERC
- December 31, 2008 - [2007-2008 Winter Wildlife Survey Report](#), submittal to FERC

## Article 407 - Recreation Resources Management Plan

- May 02, 2017 - [Second Revised Hydropower Development Recreation Report-Form 80](#), submittal to FERC
- November 21, 2016 - [2009-2014 Revised Hydropower Development Recreation Report-Form 80](#), submittal to FERC
- April 01, 2015 - [2009-2014 Hydropower Development Recreation Report-Form 80](#), submittal to FERC
- February 05, 2009 - [2002-2008 Hydropower Development Recreation Report-Form 80](#), submittal to FERC
- April 14, 2008 - [Recreation Resources Management and Implementation Plan](#), approval from FERC
- November 06, 2007 - [Recreation Resources Management and Implementation Plan](#), submittal to FERC

## Article 407 - Reach 1 Access Trail

- November 08, 2010 - [Reach 1 Trail Extension As-built](#), submittal to FERC
- August 14, 2009 - [Reach 1 Access Trail Final Construction Report](#), acknowledgement of receipt from FERC
- February 27, 2009 - [Final Construction Report and As-built](#), submittal to FERC
- August 21, 2008 - [Reach 1 Trail](#), authorization to begin construction granted from FERC
- June 02, 2008 - [Reach 1 Access Trail Contract Plans](#), request for approval of contract plans sent to FERC
- November 06, 2007 - [Reach 1 Access Trail](#), drawing

## Article 407 - Riverwalk Loop Trail Extension

- May 04, 2009 - [Riverwalk Loop Trail Extension Contract Plans and Specifications](#), acknowledgement of receipt from FERC
- January 29, 2009 - [Riverwalk Loop Trail Extension Contract Plans and Specifications](#), submittal to FERC
- September 02, 2008 - [Riverwalk Loop Trail Extension](#), order granting time extension for construction from FERC
- June 02, 2008 - [Riverwalk Loop Trail Extension](#), request for specifications and revised construction schedule submitted to FERC
- November 06, 2007 - [Riverwalk Loop Trail Extension](#), drawing

## Article 407 - Whitewater Boating

- May 20, 2015 - [2012-2014 Whitewater Monitoring Study](#), order accepting and amending Recreation Resources Management Plan from FERC
- April 29, 2015 - [2012-2014 Whitewater Monitoring Study](#), submittal to FERC
- July 16, 2012 - [Recreation Resources Management and Implementation Plan Amendment](#), approval from FERC
- May 01, 2012 - [2009-2011 Whitewater Monitoring Study](#), submittal to FERC
- July 27, 2011 - [2011 Whitewater Boating Monitoring Study Revised Schedule](#), submittal to FERC
- January 31, 2011 - [2010 Whitewater Monitoring Study](#), approval from FERC
- January 21, 2011 - [2010 Whitewater Monitoring Study](#), submittal to FERC
- November 15, 2010 - [2010 Whitewater Boating Monitoring Study](#), approval of revised schedule from FERC
- July 07, 2010 - [2010 Whitewater Boating Monitoring Study](#), submittal of revised schedule to FERC
- March 03, 2010 - [2009 Whitewater Boating on the Chelan River Monitoring Study](#), approval from FERC
- January 11, 2010 - [2009 Whitewater Boating on the Chelan River Monitoring Study](#), submittal to FERC
- July 07, 2009 - [2009 Whitewater Boating Monitoring Study Revised Schedule](#), submittal to FERC
- September 02, 2008 - [Whitewater Boating](#), order granting time extension from FERC
- June 02, 2008 - [Whitewater Boating](#), submittal of revised schedule to FERC
- September 18, 2007 - [Chelan River Whitewater Boating Monitoring Study Plan](#)

## Article 408 - Threatened and Endangered Species Protection Plan

- January 23, 2018 - [Order amending minimum instream flow table footnotes](#), approval from FERC
- December 15, 2017 - [Request to correct footnotes in order amending minimum pumped spawning flow](#), submittal to FERC
- December 7, 2017 - [Order amending minimum pumped spawning flow and related license requirements](#), approval from FERC

- November 29, 2017 – [Request to amend the Chelan River habitat channel minimum pumped spawning flow requirement](#), submittal to FERC
- April 27, 2017 - [2017 Biological Objectives Status Report](#), submittal to FERC
- October 05, 2015 - [2015 Biological Objectives Status Report](#), approval from FERC
- April 29, 2015 - [2015 Biological Objectives Status Report](#), submittal to FERC
- August 21, 2014 - [2013 Biological Objectives Status Report](#), approval from FERC
- April 30, 2013 - [2013 Biological Objectives Status Report](#), submittal to FERC
- May 19, 2010 - [Biological Objectives Status Reports](#), approval of Revised Schedule from FERC
- March 09, 2010 - [Biological Objectives Status Reports](#), submittal of Revised Schedule to FERC
- March 20, 2008 – [Order Granting Extension of Time under Article 408 and Washington Department of Ecology 401 Water Quality Certification Condition III.A.\(ii\)](#)
- February 12, 2008 – [Request for Time Extension – Minimum Flows in Chelan River and Reach 4 Stream Channel Improvements](#)
- November 28, 2007 - [Threatened and Endangered Species Protection Plan](#), approval from FERC
- May 04, 2007 - [Threatened and Endangered Species Protection Plan](#), submittal to FERC

## Article 408(a)(b) - Chelan River Projects-Low Level Outlet, Pump Station, and Reach 4/Tailrace Habitat Enhancement

- March 30, 2010 - [Chelan River Project Final Report](#), acknowledgement of receipt from FERC
- January 28, 2010 - [Chelan River Project Final Report](#), submittal to FERC
- September 15, 2009 - [Chelan River Project 14th Monthly Report](#), acknowledgement of receipt from FERC
- August 14, 2009 - [Chelan River Project 12th and 13th Monthly Reports](#), acknowledgement of receipt from FERC
- August 14, 2009 - [Chelan River Project 14th Monthly Report](#), submittal to FERC
- July 15, 2009 - [Chelan River Project 13th Monthly Report](#), submittal to FERC
- June 17, 2009 - [Chelan River Project 11th Monthly Report](#), acknowledgement of receipt from FERC
- June 12, 2009 - [Chelan River Project 12th Monthly Report](#), submittal to FERC
- May 14, 2009 - [Chelan River Project 11th Monthly Report](#), submittal to FERC
- April 14, 2009 - [Chelan River Project 10th Monthly Report](#), submittal to FERC
- April 10, 2009 - [Chelan River Project 9th Monthly Report](#), acknowledgement of receipt from FERC
- April 09, 2009 - [Chelan River Project 8th Monthly Report](#), acknowledgement of receipt from FERC
- March 13, 2009 - [Chelan River Project 9th Monthly Report](#), submittal to FERC
- February 13, 2009 - [Chelan River Project 8th Monthly Report](#), submittal to FERC
- January 30, 2009 - [Chelan River Project 7th Monthly Report](#), acknowledgement of receipt from FERC
- January 26, 2009 - [Chelan River Project 6th Monthly Report](#), acknowledgement of receipt from FERC
- January 14, 2009 - [Chelan River Project 7th Monthly Report](#), submittal to FERC
- December 15, 2008 - [Chelan River Project Monthly Report](#), submittal to FERC
- November 14, 2008 - [Chelan River Project Monthly Report](#), submittal to FERC
- November 05, 2008 - [Tailrace - Spawning Habitat](#)
- October 15, 2008 - [Chelan River Project Monthly Report](#), submittal to FERC
- September 12, 2008 - [Chelan River Project Monthly Report](#), submittal to FERC
- August 15, 2008 - [Chelan River Project Monthly Report](#), submittal to FERC
- May 28, 2008 - [Storm Water Pollution Prevention Plan \(SWPPP\) and Erosion Soil Control Plan \(ESCP\)](#), approval from Dept of Ecology
- May 27, 2008 - [Storm Water Pollution Prevention Plan \(SWPPP\) and Erosion Soil Control Plan \(ESCP\)](#), submittal to Dept of Ecology
- May 22, 2008 - [Water Quality Protection Plan](#)
- March 20, 2008 - [Chelan River Projects](#), time extension granted from FERC
- February 12, 2008 - [Chelan River Projects](#), time extension request to FERC
- January 01, 2008 - [Reach 4 - 100% Design Report](#)

- November 30, 2007 - [90% Design Drawings](#), submittal to FERC
- September 28, 2007 - [Reach 4 - 90% Design Drawings](#)
- August 15, 2007 - [Pump Station - TEE Screen](#), submittal drawings to FERC
- July 30, 2007 - [Pump Station - 60% Design Site Construction Specifications](#)
- July 30, 2007 - [Reach 4 - 60% Design Drawings](#)
- May 04, 2007 - [Pump Station - Findings Report](#)
- May 04, 2007 - [Pump Station - Procurement Drawings](#)
- May 04, 2007 - [Pump Station - Procurement Specifications](#)
- May 04, 2007 - [Pump Station - Technical Specifications](#)
- May 04, 2007 - [Reach 4 - 30% Design](#)
- May 04, 2007 - [Reach 4 - 30% Report](#)
- May 01, 2007 - [Reach 4 - Chelan River Riparian Planting](#)
- December 30, 2003 - [Reach 4 - Chelan River Spill Exceedence 1974-2003](#)

## Article 408(g) - Annual Implementation and Monitoring Report

- January 31, 2017 - [2016 Annual Implementation and Monitoring Report](#), submittal to FERC
- January 29, 2016 - [2015 Annual Implementation and Monitoring Report](#), submittal to FERC
- January 30, 2015 - [2014 Annual Implementation and Monitoring Report](#), submittal to FERC
- January 22, 2014 - [2013 Annual Implementation and Monitoring Report](#), submittal to FERC
- January 31, 2013 - [2012 Annual Implementation and Monitoring Report](#), submittal to FERC
- January 31, 2012 - [2011 Annual Implementation and Monitoring Report](#), submittal to FERC
- March 04, 2011 - [2010 Annual Implementation and Monitoring Report](#), acknowledgement of receipt from FERC
- January 21, 2011 - [2010 Annual Implementation and Monitoring Report](#), submittal to FERC
- July 08, 2010 - [2009 Annual Implementation and Monitoring Report](#), acknowledgement of receipt from FERC
- January 25, 2010 - [2009 Annual Implementation and Monitoring Report](#), submittal to FERC
- February 24, 2009 - [2008 Annual Implementation and Monitoring Report](#), acknowledgement of receipt from FERC
- January 29, 2009 - [2008 Annual Implementation and Monitoring Report](#), submittal to FERC
- February 27, 2008 - [2007 Annual Implementation and Monitoring Report](#), acknowledgement of receipt from FERC
- January 31, 2008 - [2007 Annual Implementation and Monitoring Report](#), submittal to FERC

## Article 410 - Programmatic Agreement & Historic Properties Management Plan

- December 06, 2017 - [2017 Annual Cultural Activities Report](#), submittal to FERC
- December 06, 2017 - [5-year Revised Historic Properties Management Plan](#), submittal to FERC
- December 02, 2016 - [2016 Annual Cultural Activities Report](#), submittal to FERC
- December 03, 2015 - [2015 Annual Cultural Activities Report](#), submittal to FERC
- December 02, 2014 - [2014 Annual Cultural Activities Report](#), submittal to FERC
- December 06, 2013 - [2013 Annual Cultural Activities Report](#), submittal to FERC
- November 23, 2012 - [2012 Annual Cultural Activities Report](#), submittal to FERC
- December 02, 2011 - [2011 Annual Cultural Activities Report](#), submittal to FERC
- January 13, 2011 - [2010 Annual Cultural Activities Report](#), approval from FERC
- December 06, 2010 - [2010 Annual Cultural Activities Report](#), submittal to FERC
- December 09, 2009 - [2009 Annual Cultural Activities Report](#), approval from FERC
- December 03, 2009 - [2009 Annual Cultural Activities Report](#), submittal to FERC

- January 27, 2009 - [2007 and 2008 Annual Cultural Activities Reports](#), acknowledgement of receipt from FERC
- December 05, 2008 - [2008 Annual Report of Cultural Activities](#), submittal letter to FERC
- December 05, 2007 - [2007 Annual Report of Cultural Activities](#), submittal letter to FERC

## Article 410 - Area of Potential Effect

- November 16, 2017 - [2017 Archaeological Monitoring Report](#), prepared by AINW
- October 16, 2017 - [2016 Archaeological Monitoring Report](#), prepared by AINW
- March 23, 2016 - [2015 Archaeological Monitoring Report](#), prepared by Cultural Resource Consultants
- December 01, 2011 - [2011 Archaeological Monitoring Report](#), prepared by Cultural Resource Consultants
- May 31, 2010 - [2010 Archaeological Monitoring Report](#), prepared by Cultural Resource Consultants
- April 08, 2010 - [2009 Archaeological Monitoring Report](#), prepared by Cultural Resource Consultants
- September 23, 2008 - [2008 Archaeological Monitoring Survey](#), prepared by Cultural Resource Consultants
- May 29, 2008 - [2008 Preliminary Testing Recommendations](#), prepared by Cultural Resource Consultants
- May 27, 2008 - [2008 Archaeological Monitoring Summary](#), prepared by Cultural Resource Consultants
- March 01, 2008 - [Archaeological Sites and Resources Monitoring Plan](#), prepared by Cultural Resources Consultants

## Article 410 - Education Program

- March 29, 2010 - [Cultural Resources Interpretive and Education Program](#), approval from FERC
- October 30, 2009 - [Cultural Resources Interpretive and Education Program](#), submittal to FERC

## Article 410 - Traditional Cultural Properties Management Plan

- May 02, 2013 - [Errata Notice-Order Approving Revised Traditional Properties Management Plan](#), FERC's correction of filing date
- April 25, 2013 - [Traditional Cultural Properties Management Plan, Revised](#), approval from FERC
- October 24, 2012 - [Traditional Cultural Properties Management Plan, Revised](#), submittal to FERC
- December 08, 2011 - [Traditional Cultural Properties Management Plan](#), approval from FERC
- October 11, 2011 - [Traditional Cultural Properties Management Plan](#), submittal to FERC
- May 10, 2011 - [Traditional Cultural Properties Management Plan](#), third request for extension of time granted by FERC
- November 08, 2010 - [Traditional Cultural Properties Management Plan](#), request for third extension of time submittal to FERC
- October 02, 2008 - [Traditional Cultural Properties Management Plan](#), second request for extension of time granted by FERC
- September 15, 2008 - [Traditional Cultural Properties Management Plan](#), request for second extension of time submittal to FERC
- September 14, 2007 - [Traditional Cultural Properties Management Plan](#), time extension granted by FERC
- August 01, 2007 - [Traditional Cultural Properties Management Plan](#), time extension submittal to FERC

## Appendix A - Settlement Agreement Articles

### Article 1(a)(1) - Erosion Control Implementation Plan (USFS)

- December 14, 2007 - [Erosion Control Implementation Plan](#), approval from FERC

- November 06, 2007 - [Erosion Control Implementation Plan and Erosion Monitoring and Maintenance Plan](#), submittal to FERC

## Article 1(a)(2) - Site Specific Erosion Control Plans (USFS)

- November 16, 2017 - [Site Specific Erosion Control Plan \(Sites 5a,5b,8a,8b,10a,10b and 12\)](#), modifying and approval from FERC
- August 30, 2017 - [Site Specific Erosion Control Plan \(5a,5b,8a,8b,10a,10b and 12\)](#), submittal to FERC
- April 23, 2015 - [Erosion Sites 1, 2 and 14-17](#), order granting extension of time
- February 04, 2015 - [Erosion Sites 1, 2 and 14-17](#), notification of revised schedule
- August 27, 2013 - [Erosion Sites 1, 2 and 14-17](#), approval from FERC
- June 14, 2013 - [Erosion Sites 1, 2 and 14-17](#), submittal to FERC
- February 04, 2011 - [Erosion Sites 24, 25, 26, 27](#), order granting a revised schedule from FERC
- December 17, 2010 - [Erosion Sites 24, 25, 26, 27](#), notification of revised schedule
- March 29, 2010 - [Site Specific Erosion Control Plan \(Sites 24, 25, 26, and 27\)](#), approval from FERC
- March 12, 2010 - [Erosion Control Report-Corral and Prince Creek \(Sites 11 and 55\)](#)
- November 18, 2009 - [Site Specific Erosion Control Plan \(Sites 24, 25, 26, and 27\)](#), submittal to FERC
- April 22, 2009 - [Erosion Control Treatment- Deer Point Campground \(Site 58\)](#)
- April 08, 2009 - [1st Quarter Report - Mitchelle Creek Campground \(Site 59\)](#), draft report
- November 06, 2007 - [Site Specific Erosion Control Plan \(Sites 11, 55, 58, and 59\)](#), submittal to FERC

## Article 1(a)(3) - Erosion Monitoring and Maintenance (USFS)

- April 13, 2017 - [Monitoring and Maintenance Erosion Control Report \(Sites 24, 26, and 27\)](#)
- April 25, 2016 - [Monitoring and Maintenance Erosion Control Report \(Sites 11, 55, 58, and 59\)](#)
- May 08, 2014 - ["Track-changes" and "Clean" Version of the USDA Forest Service Erosion Control Monitoring and Maintenance Plan](#), submittal to FERC
- April 04, 2014 - [Supplemental Consultation Information for Proposed Revisions](#), submittal to FERC
- February 25, 2014 - [Proposed Revisions to Section 3.1, Long-term Monitoring of Erosion](#), submittal to FERC

## Article 2 - Erosion Control Plan (NPS)

- July 31, 2015 - [Erosion Control Plan Progress](#)
- March 30, 2015 - [Recreation Stabilization Project](#)

## Article 5 - Survey Monument Replacement Plan

- December 09, 2013 - [Survey Monuments](#), U.S. Department of Agriculture Forest Service

## Article 6(a) - Food Web Model

- February 01, 2010 - [Predation Impacts of Lake Trout and Chinook Salmon in Lake Chelan](#), Washington Cooperative Fish and Wildlife Research Unit
- May 16, 2007 - [Lake Chelan Food Web Model Presentation](#), Washington Cooperative Fish and Wildlife Research Unit

## Article 6(b) - Fish Monitoring and Evaluation

- July 12, 2013 - [2000 and 2010 Stehekin River Kokanee Expanded Spawning Surveys](#), National Park Service
- June 07, 2013 - [Largemouth bass caught off Purple Point Dock at Stehekin](#), documentation of bass in the Lucerne Basin of Lake Chelan
- January 01, 2013 - [2012 Lake Chelan Kokanee Spawning Ground Surveys](#), Chelan PUD
- June 25, 2012 - [2009-2011 Lower Stehekin River Cutthroat and Rainbow Trout Spawning Surveys](#), National Park Service
- April 26, 2012 - [Monitoring and Evaluation](#), summary of all activities
- January 02, 2012 - [2011 Lake Chelan Kokanee Spawning Ground Surveys](#), Chelan PUD
- December 31, 2010 - [2010 Lake Chelan Kokanee Spawning Ground Surveys](#), Chelan PUD
- November 29, 2010 - [2009 Lower Stehekin River Cutthroat and Rainbow Trout Spawning Surveys](#), National Park Service
- December 31, 2009 - [2009 Lake Chelan Kokanee Spawning Ground Surveys](#), Chelan PUD
- December 01, 2009 - [2009 Lake Chelan Cutthroat Trout Spawning Ground Survey Report](#), US Department of Agriculture-Forest Service
- December 31, 2008 - [2008 Lake Chelan Kokanee Spawning Ground Surveys](#), Chelan PUD
- December 18, 2008 - [Lake Chelan Kokanee Management Plan](#), Washington Department of Fish and Wildlife
- September 01, 2008 - [Stehekin River Kokanee Photographs](#), Washington State Department of Fish and Wildlife

## Article 10(c) - Area of Potential Effect

- February 09, 2009 - [Scroll above to Article 410 to view all reports](#)

## Article 10(f) - Traditional Cultural Properties

- February 09, 2009 - [Scroll above to Article 410 to view all reports](#)

## Article 10(j) - Education Program

- February 09, 2009 - [Scroll above to Article 410 to view all reports](#)

## Article 11 - Recreation Resources Management Plan

- July 31, 2015 - [Erosion Control Plan Progress](#)
- March 30, 2015 - [Recreation Stabilization Project](#)

## Article 11(h) - Whitewater Boating

- February 09, 2009 - [See Article 407 to view all reports](#)

## Article 11(j) - Reach 1 Access Trail

- February 09, 2009 - [See Article 407 to view all reports](#)

## Article 11(k) - Riverwalk Loop Trail Extension

- February 09, 2009 - [See Article 407 to view all reports](#)

## Appendix D - 401 Water Quality Certification

### Condition IV.E - Biological Objectives Status Reports

- April 27, 2017 - [2017 Biological Objectives Status Report](#), submittal to FERC
- October 05, 2015 - [2015 Biological Objectives Status Report](#), approval from FERC
- April 29, 2015 - [2015 Biological Objectives Status Report](#), submittal to FERC
- August 21, 2014 - [2013 Biological Objectives Status Report](#), approval from FERC
- April 30, 2013 - [2013 Biological Objectives Status Report](#), submittal to FERC
- May 19, 2010 - [Biological Objectives Status Reports](#), approval of Revised Schedule from FERC
- March 09, 2010 - [Biological Objectives Status Reports](#), submittal of Revised Schedule to FERC

### Condition V.B. - Quality Assurance Project Plan (Included as Appendix A of Article 405 - OCMP)

- June 01, 2016 - [Chelan River Water Temperature Modeling Study Quality Assurance Project Plan Report](#), submittal to FERC
- December 03, 2015 - [Chelan River Water Temperature Modeling Study Report](#), request for time extension
- June 05, 2015 - [Chelan River Water Temperature Modeling Study Report](#), FERC Order issuing extension of time
- May 01, 2015 - [Chelan River Water Temperature Modeling Study Report](#), request for time extension
- April 29, 2015 - [Revised Quality Assurance Project Plan for the Chelan River Water Temperature Modeling Study](#), submittal to FERC
- April 15, 2015 - [Revised Water Quality Monitoring Quality Assurance Project Plan Version 2](#), submittal to FERC
- September 04, 2014 - [Chelan River Water Temperature Modeling Quality Assurance Project Plan](#), approval from FERC
- April 11, 2014 - [Chelan River Water Temperature Modeling Quality Assurance Project Plan](#), submittal to FERC
- November 30, 2007 - [Quality Assurance Project Plan](#), order modifying and approval from FERC
- May 04, 2007 - [Quality Assurance Project Plan](#), submittal to FERC

## Appendix E - National Marine Fisheries Service Conditions

### Section U - Implementation Monitoring

- November 17, 2010 - [Chelan River Implementation Monitoring Report](#), acknowledgement of receipt from FERC (second)
- September 16, 2010 - [Chelan River Implementation Monitoring Report](#), acknowledgement of receipt from FERC
- August 12, 2010 - [Chelan River Implementation Monitoring Report](#), submittal to FERC and National Marine Fisheries Service
- July 08, 2010 - [Implementation Monitoring Report Revised Schedule](#), acknowledgement of receipt from FERC
- May 03, 2010 - [Implementation Monitoring Report Revised Schedule](#), submittal to FERC and National Marine Fisheries Service

## Appendix F – ESA Documents

- September 28, 2015 - [U.S. Fish and Wildlife Service. 2015. Recovery plan for the coterminous United States population of bull trout \(\*Salvelinus confluentus\*\). Portland, Oregon. xii + 179 pages.](#)
- September, 2015 – [Oregon Fish and Wildlife Office of the U.S. Fish and Wildlife Service, Mic-Columbia Recovery Unit Implementation Plan for Bull Trout.](#)
- January 20, 2012 - [What Happened to Bull Trout in Lake Chelan? An Examination of the Historical Evidence.](#) Mark C. Nelson. U.S. Fish and Wildlife Service, Mid-Columbia River Fishery Resource Office. Leavenworth, WA.
- October 14, 2005 – [National Marine Fisheries Service Biological Opinion for Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation: Issuance of a new license to operate the Lake Chelan Hydroelectric Project \(FERC No. 637\), Chelan County, Washington. NMFS Consultation No. 2002/01303.](#)
- October 10, 2003 – Notice of Availability of [Final Environmental Assessment for Hydropower License, Lake Chelan Hydroelectric Project, FERC Project No. 637.](#)
- December 2, 2003 – [Clarification of Preferred Alternative and Request for Concurrence with Endangered Species Determinations](#)
- December 24, 2003 – [Response to Clarification of Preferred Alternative and Request for Concurrence with Endangered Species Act Determination, Lake Chelan Hydroelectric Project \(FERC No. 637\).](#) FWS Reference 04-0115. HUC: 1702000903
- November 29, 2002 – [Letter requesting concurrence on “not likely to adversely affect” determination for threatened and endangered species under Section 7 of the Endangered Species Act on the licensing of the Lake Chelan Hydroelectric Project \(FERC No. 637\).](#)