

## **EXHIBIT C – CONSTRUCTION SCHEDULE**

---

### **C.1 CONSTRUCTION SCHEDULE**

A preliminary construction schedule as shown in Figure C-1 has been developed for the Enloe Hydroelectric Project to show the sequencing of principal activities through the engineering design and construction process.

The schedule assumes that the FERC license application is accepted in early 2009 and that compliance with the National Environmental Policy Act (NEPA) is completed in about one year (by spring 2010). Based on these assumptions, the four-year schedule shows a traditional design-bid-build approach. However, depending on Project financing needs and conditions in construction markets, the District may choose to construct the Project under a design-build approach, which would somewhat condense the design and construction processes.

The construction schedule shows the planned phasing of engineering design and construction activities relative to the seasonal weather and river conditions at the Enloe site. Engineering design would take about 10 months and would include supplementary investigations to assist in final engineering design. Preparation of bid documents, solicitation of bids from equipment vendors and construction contractors, and negotiation of contracts is estimated to take an additional six months.

Procurement, manufacture, and delivery of the two-unit water-to-wire turbine/generator package is expected to take 12 months, with shorter periods required for smaller packages such as gates, hoists, penstock cans, transformers, switchgear etc. These would be sequenced to suit construction plans.

Construction of power facilities is planned to take about 18 months. Road access improvements, installation of a temporary cofferdam, and construction of the training wall would be carried out prior to a three month shutdown during the first winter. Most of the site excavation and concrete construction would be conducted during the following construction season, with installation of electrical and mechanical equipment occurring in fall and through the second winter. When the plant is substantially complete it would be tested and commissioned and would be scheduled to commence operations in early spring.

Installation of the crest gates would be carried out during the subsequent fall when river flows are low at which time the new powerplant would be used to draw down the reservoir to an elevation just below the crest of the spillway. During this time, a temporary siphon would be installed on the spillway crest to maintain downstream flow in the event of an unplanned plant outage



## **C.2 COMMERCIAL OPERATION DATE**

For planning purposes, the proposed date for commercial operation is approximately April 15, 2013.

## **C.3 EXISTING FACILITIES**

No portion of the proposed Enloe Hydroelectric Project consists of previously constructed, unlicensed water power structures or facilities. Another project at the Enloe Dam previously operated under a license granted by the Federal Power Commission (FPC), ceased operations in 1958. A brief chronology of the Project's history follows.

The FPC issued an order licensing Project No. 2062 on June 26, 1956. The Enloe Hydroelectric Project previously operated under a Department of Interior Power Permit issued in 1918 to Okanogan Valley Power Company, which was transferred to Washington Water Power in 1929 and to Public Utility District No. 1 of Okanogan County (the District) in 1945 (FPC Order Issuing License Project No. 2062, June 26, 1956).

## **HISTORY OF PROJECT DEVELOPMENT AND OWNERSHIP**

A detailed description of the hydroelectric development at the Enloe Hydroelectric Project site and of the ownership of facilities prior to the District is provided in the Historical American Engineering Record (HAER; see Appendix E.4.1).

## **EARLY PROJECTS**

The Enloe Hydroelectric Project is located on the Similkameen River about 3.5 miles northwest of the City of Oroville, in north-central Washington State, near the Canadian border. The history of hydropower development at this site, just upstream of Similkameen Falls on the lower Similkameen River, spans the past century.

According to the HAER (Appendix E.4.1), the earliest known power production on the Similkameen River occurred when an elderly German settler named Kruger placed a small waterwheel on a shaft and lowered it into the Similkameen River (Vissia 1974). The exact location of the waterwheel and powerhouse has been lost to time. This first powerhouse with its small generator furnished electricity for the mining town of Golden, located 6 miles to the south.

The first hydroelectric powerplant, a run-of-river project, was built at Similkameen Falls by the Similkameen Power Company, organized by J.M. Hagerty in 1902. Hagerty secured land and water rights at the site and spent the next three years developing the project until his death in 1905. Hagerty started construction on a wooden crib dam above the Similkameen Falls to divert water to the powerhouse below the falls. The wooden dam and powerhouse were completed in 1906, about a year after his death.

The plant supplied power and light to the towns of Oroville and Nighthawk, as well as local irrigation. The dam had contracts with the Owasco and Ivanhoe mines, where electric power was to be used in driving a 4,000-foot tunnel (Hallauer 1979). The Ruby and Caaba mine was also supplied with power, as was the Wannacut Lake mining camp of Golden.

The plant was leased to J.L. Harper and his associates, of Republic, Washington, in June, 1910. Operating under the name of North Washington Power Company, the consortium signed a ten-year lease obligating the Company to install a power line from Oroville to service Republic mines and mills. In October of the same year the Company announced plans to add 950hp to the Hagerty powerhouse (*Oroville Weekly Gazette* 2 September 1910:1). It appears that the North Washington Power Company failed to accomplish either of its envisioned plans as in 1913 executors of the Hagerty estate moved to cancel the lease for failure to perform and listed the property for sale (*Oroville Weekly Gazette* 14 March 1913:1).

In 1915, the Okanogan Water Company, a subsidiary of the Washington Water Power Company of Spokane, contested the water rights of the Similkameen Power Company. The West Okanogan Valley Irrigation District opposed the claims of both power companies, seeking the opportunity to develop power in connection with its irrigation system (*Oroville Weekly Gazette* 29 October 1915:1). Bo Sweeney, Assistant Secretary of the Department of the Interior, awarded the title of rightful claimant to the water power in the Similkameen River to the Similkameen Power Company.

## **ENLOE ERA**

Eugene Enloe incorporated the Okanogan Valley Power Company (OVPC) under the laws of the State of Washington in 1913. In 1916, the OVPC bought the complete holdings of the Similkameen Power Company, including the powerhouse and all related machinery, and the power lines and substations that serviced the mines. Construction of the arch-gravity dam appears to have begun in 1919 and was completed in the summer of 1920, as evidenced by the inscription stamped on the west abutment of the dam. The Project itself, however, was not completed for three more years, in 1923 (FPC Order Issuing License Project No. 2062, June 26, 1956). The Project served the mining community of Nighthawk upstream, and the crossroads town of Oroville downstream.

In July of 1922 Enloe Dam drew the attention of large power companies. Washington Water Power (WWP) had already extended a power line into Grant County early in 1922 (*Oroville Weekly Gazette* 21 July 1922:1). That year WWP approached Eugene Enloe, expressing interest in acquiring the facility. On January 1, 1923, Enloe sold the property to Washington Water Power. WWP then installed a second penstock from the dam and a second generating unit in the powerhouse (*Oroville Weekly Gazette* 11 May 1923:1). The Company also constructed cottages (since removed) near the east abutment of the dam to house operators of the facility.

WWP continued to operate Enloe Hydroelectric Project until 1945, when Public Utility District No. 1 of Okanogan County acquired the property. The District acquired the hydropower project on May 11, 1945 (FPC Order Issuing License Project No. 2062, June 26, 1956), and has owned it since. The District ceased operation of the power generators on 29 July 1958 when the extension of Bonneville Power Administration's high-voltage transmission line into the Okanogan Valley provided a less expensive source of power. Operation of Enloe Dam became unprofitable, and the facilities were abandoned. Operation was discontinued because the generating equipment had become obsolete and repair or modernization of the power facilities was not economically feasible. One of the penstocks, which had largely collapsed, was sold for salvage.

## **HISTORICAL AND REMAINING PROJECT FACILITIES**

A detailed description of the original Enloe Hydroelectric Project facilities is provided in the HAER (Appendix E.4.1). Initially a 1,600 kW unit was installed, followed by the addition of a second 1,600 kW unit in 1924.

The Project as licensed in 1956 was described as follows (FPC Order Issuing License Project No. 2062, June 26, 1956):

*“Principal structures consisting of: a concrete arch dam approximately 54 feet high and 340 feet long forming a reservoir with area of about 85 acres at spillway level and useful storage capacity of 212 acre-feet with a 2.5 foot drawdown; two woodstave pipe lines approximately 700 feet long; a powerhouse containing two 2,500-horsepower turbines and two 1,600 kilowatt generators; transformers; switching equipment; a 33-kilovolt transmission line from the Oroville power plant to Tonasket substation; a step-up substation at the Oroville plant; and appurtenant facilities.”*

The original water conveyance structures, surge tanks, and powerhouse remain on the site, but are no longer functional. One of the two woodstave pipelines still remains in place, running from the dam about 800 feet downstream to two large woodstave and steel surge tanks that regulated hydraulic transients on the penstocks that fed water to the turbines and generators in the powerhouse. The powerhouse itself is in poor condition: it has extensively deteriorated and has been vandalized. The original turbines are deteriorated but remain in place; however, most of the copper and small electrical equipment has been removed from the Project site. A suspension bridge which provided foot-access across the river to the powerhouse also has been removed, as has the railroad on the west side of the river, which provided freight access to the powerhouse. However, single lane vehicle access is available along the old railroad grade.

Enloe Dam itself remains a viable structure. As described in Exhibit A, the dam is a 54-foot high, 315-foot long concrete gravity arch structure with a broad central overflow spillway that is 276 feet long. Enloe Dam impounds a small reservoir approximately 2 miles long and varies from about 120 feet wide to 440 feet wide. Recent soundings

indicate an average depth of 8.4 feet relative to the existing spillway crest elevation of 1044.3 feet. It is estimated that the original approximately 1,600 acre-feet reservoir has been reduced to about 507 acre-feet of water storage capacity (with water at the existing spillway crest height) by the accumulation of sediment.