

## **Appendix B**

### **Draft Exhibit A Project Description**



**Application for New License**  
**Major Project – Existing Dam**

**Exhibit A**  
**Project Description**  
**Security Level: Public**

Narrows Hydroelectric Project  
FERC Project No. 1403



Prepared by:  
Yuba County Water Agency  
1220 F Street  
Marysville, CA 95901  
[www.ycwa.com](http://www.ycwa.com)

Draft – 1/28/2021



**Table of Contents**

<b>Section No.</b>	<b>Description</b>	<b>Page No.</b>
1.0	Introduction.....	A-1
2.0	Project Location .....	A-2
3.0	Existing Project Facilities, Features and Boundary .....	A-5
4.0	YCWA’s Proposed Changes to Existing Project Facilities, Features and Boundary .....	A-6
5.0	References Cited .....	A-6

**List of Figures**

<b>Figure No.</b>	<b>Description</b>	<b>Page No.</b>
2.0-1.	Yuba River watershed in relation to the Feather River and other tributaries to the Sacramento River.....	A-3
2.0-2.	YCWA’s Narrows Hydroelectric Project and surrounding non-Project facilities and features. ....	A-4

**List of Tables**

<b>Table No.</b>	<b>Description</b>	<b>Page No.</b>
3.0-1.	Lands of the United States enclosed within the existing FERC Project Boundary and managing federal agency.....	A-6

**List of Attachments**

None.

Page Left Blank

## EXHIBIT A

# PROJECT DESCRIPTION

---

## 1.0 Introduction

The Yuba County Water Agency (YCWA or Licensee) has prepared this Exhibit A, Project Description, as part of its Application for a New License Major Project – Existing Dam – (FLA) from the Federal Energy Regulatory Commission (FERC or Commission) for the Narrows Hydroelectric Project (Project), FERC Project Number 1403. This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Licenses, Permits, Exemptions and Determination of Project Costs), Subpart F and, as applicable, Part 16 (traditional process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Section 4.51(b), which describes the contents of Exhibit A, Project Description. This section will also serve to satisfy the requirements of 18 C.F.R. Section 5.6(d)(2)(iii). This Exhibit A describes, in detail, all existing and YCWA-proposed Project facilities. As a reference, 18 C.F.R. Section 4.51(b) states:

Exhibit A is a description of the Project. This exhibit need not include information on project works maintained and operated by the U.S. Army Corps of Engineers, the Bureau of Reclamation, or any other department or agency of the United States, except for any project works that are proposed to be altered or modified. If the project includes more than one dam with associated facilities, each dam and the associated component parts must be described together as a discrete development. The description for each development must contain:

- (1) The physical composition, dimensions, and general configuration of any dams, spillways, penstocks, powerhouses, tailraces, or other structures, whether existing or proposed, to be included as part of the project;
- (2) The normal maximum surface area and normal maximum surface elevation (mean sea level), gross storage capacity, and usable storage capacity of any impoundments to be included as part of the project;
- (3) The number, type, and rated capacity of any turbines or generators, whether existing or proposed, to be included as part of the project;
- (4) The number, length, voltage, and interconnections of any primary transmission lines, whether existing or proposed, to be included as part of the project (see 16 U.S.C. 796(11));
- (5) The specifications of any additional mechanical, electrical, and transmission equipment appurtenant to the project; and
- (6) All lands of the United States that are enclosed within the project boundary described under paragraph (h) of this section (Exhibit G), identified and tabulated by legal subdivisions of a public land survey of the affected area or, in the absence of a public land survey, by the best available legal description. The tabulation must show the total acreage of the lands of the United States within the project boundary.

Besides introductory material, this exhibit includes four sections. The Project's location is described in Section 2.0. Section 3.0 provides details of the existing Project facilities, features, and Project Boundary. Section 4.0 describes YCWA's proposed changes to existing Project facilities and features, and Section 5.0 provides a bibliography of any references in this exhibit.

All elevation data in this exhibit are in United States Department of Commerce, National Oceanic and Atmospheric Administration, National Geodetic Survey Vertical Datum of 1929

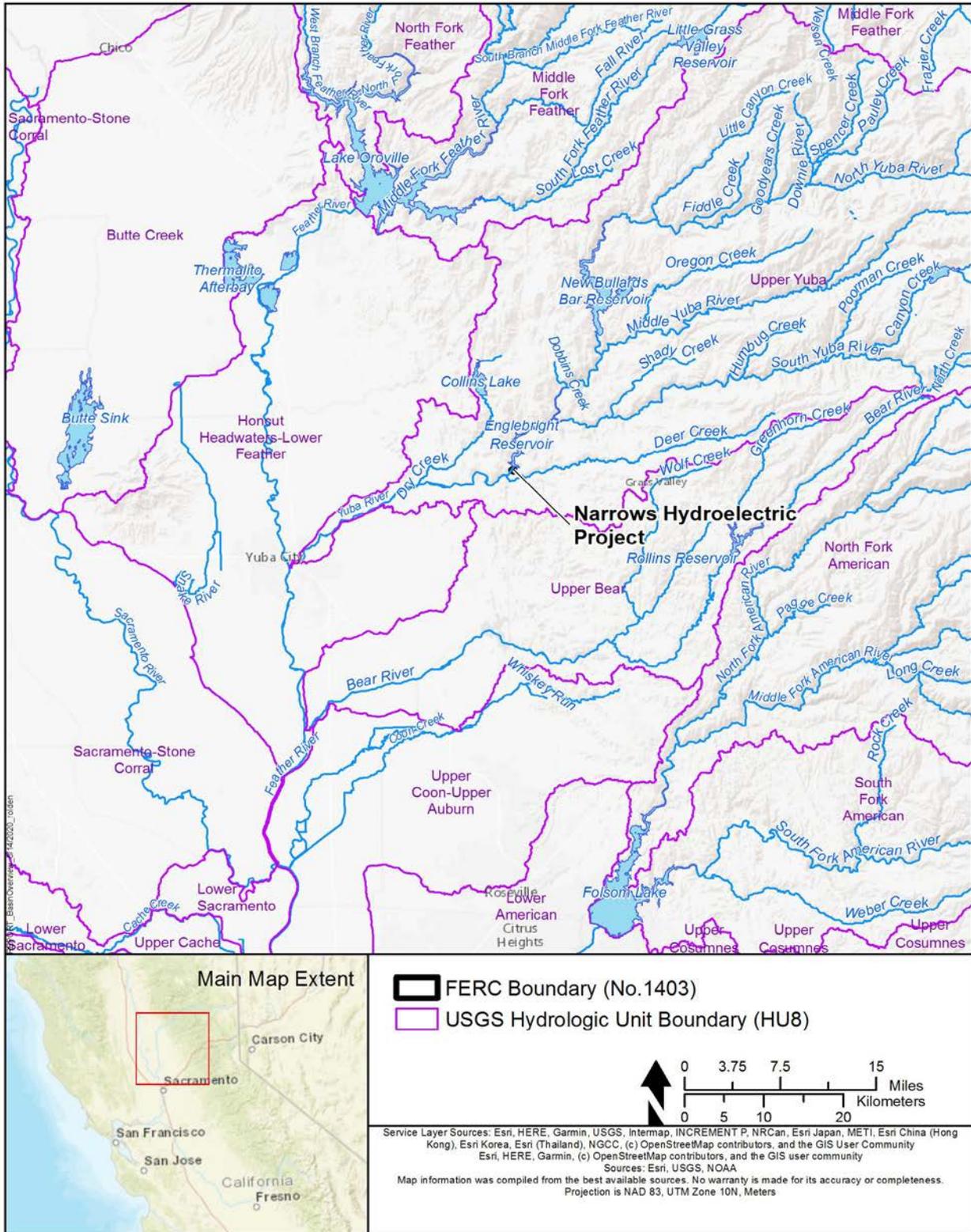
(NGVD 29), unless otherwise stated.

## **2.0 Project Location**

The Project is located on the mainstem of the Yuba River in northern California in Nevada County, in the western foothills of the Sierra Nevada. Project facilities, which range in elevation from 300 feet (ft) to 849 ft, are located on the south slope (bank) of the river approximately 0.2 mile downstream of the non-Project Englebright Dam<sup>1</sup>, a federally-owned dam administered by the United States Department of Defense, Army Corps of Engineers, and YCWA's Narrows 2 Powerhouse and Full Bypass, which are located on the north slope (bank) of the river at the base of Englebright Dam. Narrows 2 Powerhouse and Full Bypass are part of YCWA's Yuba River Development Project (YRDP), FERC Project No. 2246. From the Narrows 1 Powerhouse, the Yuba River flows approximately 24.1 miles to its confluence with the Feather River, which is part of the Sacramento River Basin and drains into the Sacramento River and subsequently into the San Francisco Bay. The Yuba River has a drainage area of approximately 1,108 square miles at Englebright Dam and 1,339 square miles at its confluence with Feather River. Figure 2.0-1 illustrates the regional location of the Project. Figure 2.0-2 shows existing Project facilities, features and Project Boundary and nearby surrounding non-Project facilities and features.

---

<sup>1</sup> Englebright Dam, which is a high variable radius concrete arch dam approximately 1,142 ft wide and 260 ft high that forms Englebright Reservoir, was constructed by the California Debris Commission in 1941. When the California Debris Commission was decommissioned in 1986, administration of Englebright Dam and Reservoir passed to the USACE. The primary purpose of the dam is to trap and contain sediment derived from extensive historic hydraulic mining operations in the Yuba River watershed. Englebright Reservoir is about 9 mi long and has a shoreline length and surface area of about 24 miles and 815 ac, respectively, at its normal maximum water surface elevation of 527 ft at the spillway crest invert elevation. Englebright Reservoir when first constructed had a gross storage capacity of 70,000 acre-feet (ac-ft); however, due to sediment capture, the gross storage capacity today is estimated to be approximately 50,000 ac-ft (Childs et al. 2003). The dam and its associated facilities, including the USACE's tunnel do not include hydropower facilities and, as federal facilities, are not under FERC's jurisdiction.



**Figure 2.0-1. Yuba River watershed in relation to the Feather River and other tributaries to the Sacramento River.**

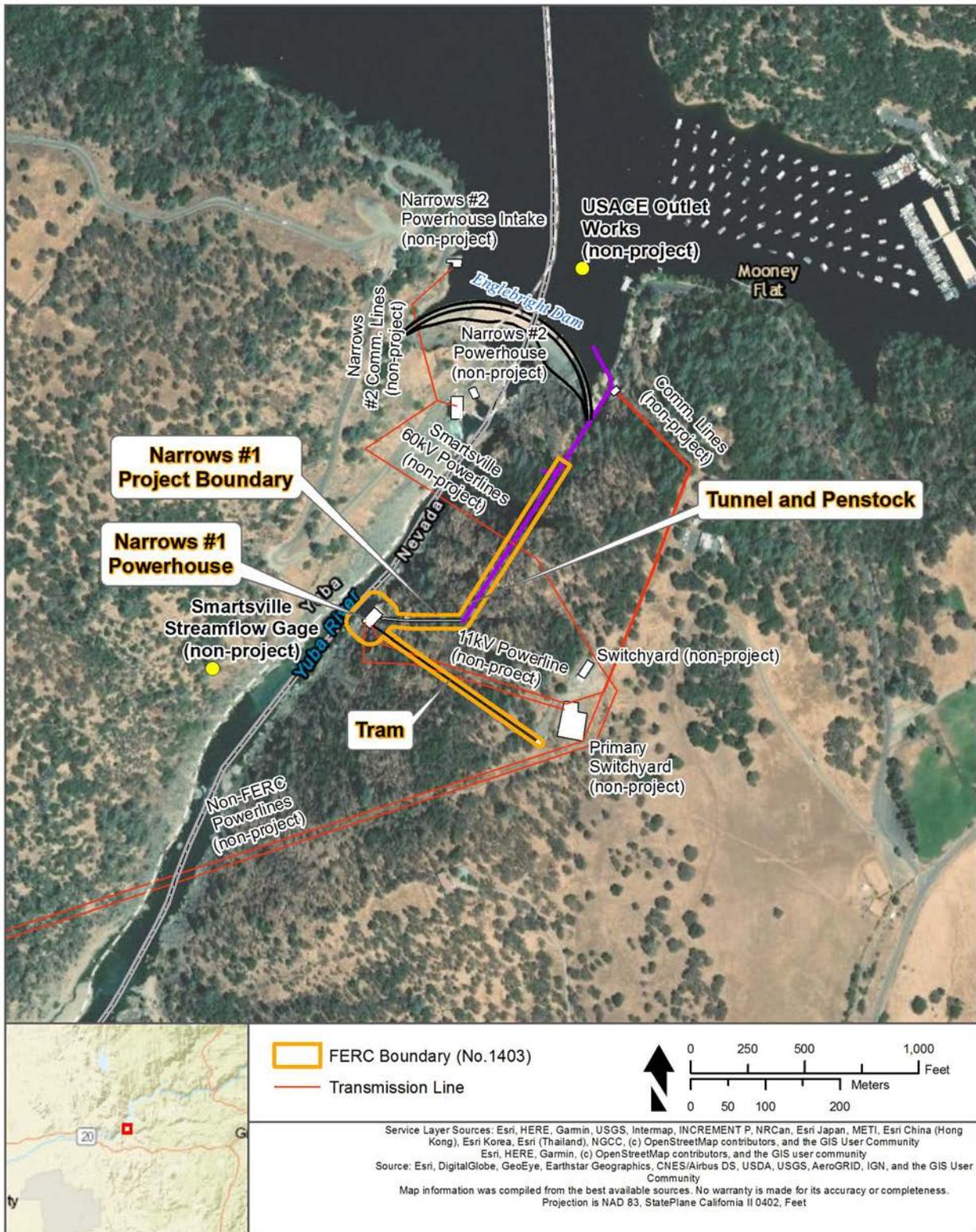


Figure 2.0-2. YCWA’s Narrows Hydroelectric Project and surrounding non-Project facilities and features.

### **3.0 Existing Project Facilities, Features and Boundary**

The existing Project consists of one development - Narrows – that, in total, includes: one tunnel, one penstock, one powerhouse and one powerhouse access tram. The Project does not include any dams or reservoirs, open water conveyance facilities, switchyards, transmission lines, roads, streamflow gages, recreation facilities, or active borrow or spoil areas. Existing Project facilities include:

- Narrows Tunnel - a 1,077-ft-long tunnel that begins at a USACE tunnel and connects to the Narrows Penstock. The first 1,000 ft of the Project tunnel is irregularly shaped and gunite-lined, with an average height of 11 ft 9 inches (in.) and an average width of 11 ft 6 in. The next 77 ft of the tunnel consists of an 8-ft diameter, gunite-lined circular section. The Project includes an adit portal located on the southeastern wall of the Yuba River canyon, which connects to the Project tunnel near the upstream end. The Project does not include a control gate at the upstream end of the tunnel.
- Narrows Penstock - a 266-ft long steel pipe that connects the Narrows Tunnel to the Narrows 1 Powerhouse. The penstock exits the tunnel part way up the southeastern wall of the Yuba River canyon at an elevation of 436 ft. The penstock is exposed for 165 ft between the upper and lower anchor blocks, where it is inclined down the slope at an angle of 55 degrees. The steel pipe has welded longitudinal seams and riveted circumferential butt joints. The penstock pipe plate thickness varies from 7/16 in. to 1/2 in. The first 260 feet are 8 ft inside diameter, and the last 6 ft taper from 8 ft to 7.6 ft inside diameter. Most of the penstock pipe is above ground, supported on the hillside by two anchors and three piers. A standpipe for pressure release is attached to the upper end of the penstock and extends further up the slope above the penstock. The surge structure is a 227-ft-long, 24-in. steel standpipe.
- Narrows 1 Powerhouse - a reinforced concrete structure, 82 ft 6 in. by 43 ft 8 in. and a total height of approximately 92 ft. It contains a main floor, basement, and sub-basement. The powerhouse was constructed in 1941-1942 and began commercial operation on December 29, 1942. The turbine within the powerhouse consists of a single vertical “I.P. Morris” Francis turbine designed for 13,500 horsepower at 235 ft effective head and is capable of passing up to 730 cubic feet per second (cfs) at 180 ft of maximum static head of 240 ft. The minimum static head is 163 ft. The turbine is equipped with a Pelton Water Wheel Company 100 percent relief valve with a 60-in. inlet and a 48-in. outlet. A 90-in. butterfly valve is located in the penstock at the turbine inlet. Control of the unit is accomplished with a Pelton hydraulic controller, which is a combination hydraulic cylinder and motor-driven jack screw functioning in place of a servomotor. Penstock pressure is used in the hydraulic cylinder to operate the turbine wicket gates. The hydraulic cylinder is used instead of a governor. The generator is a 3-phase, 60 Hertz, 11,000 volt, 300 revolutions per minute (rpm) 12,000 kilovolt-amperes (kVA), 0.85 power factor vertical Westinghouse Electric and Manufacturing Company unit. The generator is directly connected to the turbine and to the 250-volt, 100 kVA direct current exciter. The exciter field is energized from the 125-volt storage battery and charging set. The generator has Class “D” insulation throughout. The field has a built-in full

amortisseur winding. The generator is provided with a closed system of air cooling and bearings are water cooled. Additional generator protection is provided for overload, overvoltage, overspeed, and temperature. Once water has been utilized by the turbine to generate electricity it exits the powerhouse and discharges directly into the Yuba River. A 48-in. bypass pipe with a 48-in. butterfly valve and a 48-in. by 36-in. “Larner Johnson” needle valve is located on the penstock side of the penstock butterfly valve for the purpose of bypassing water to the Yuba River when the unit is shut down. Maximum hydraulic capacity through the bypass is 550 cfs. YCWA reports flow through the powerhouse via the United States Geologic Survey Gage 11417970, Narrows No. 1 Powerhouse at Englebright Dam, Ca.

- **Powerhouse Access Tram** - a car running on a steel track from elevation 849 ft to the main generator floor elevation of 332 ft. The tramcar is cable hoisted from an electrically operated drum located at the top of the tramway. When not in use, the tramcar is stored in a wood-framed structure containing the hoist and electronics for the hoist controls. The structure has plan dimensions of approximately 20 ft by 32 ft. The foundation of the hoist, motors, and tram house is constructed of reinforced concrete.

The FERC Project Boundary consists of all lands necessary for YCWA’s safe operations and maintenance of the Project. The existing FERC Project Boundary includes 2.92-acres (ac): 2.37 ac, which includes all lands on which aboveground Project facilities and features are located, and 0.55 ac of USACE lands, which are above Narrows Tunnel (i.e., no surface facilities on federal lands). The boundary includes 30 ft on either side of centerline along the Narrows Tunnel and Narrows Penstock (i.e., a 60 ft corridor), 15 ft on either side of the centerline of the Powerhouse Access Tram (i.e., a 30 ft corridor), and 65 ft from the Narrows 1 Powerhouse outside wall. Table 3.0-1 identifies by Public Land Survey System each section within the existing FERC Project Boundary that is federal lands.

**Table 3.0-1. Lands of the United States enclosed within the existing FERC Project Boundary and managing federal agency.**

Administered by	Township	Range	Section	Acres
USACE	16N	6E	14	0.55
<b>Total</b>				<b>0.55</b>

Source: Yuba County Geographic Information System Parcel Base, obtained August 2013, modified per the United States Department of Agriculture, Forest Service’s request.

## **4.0 YCWA’s Proposed Changes to Existing Project Facilities, Features and Boundary**

At this time, YCWA does not propose any changes to existing Project facilities and features or the FERC Boundary. YCWA reserves its right to propose changes as the relicensing proceeds.

## **5.0 References Cited**

None.