RECLAMATION
*Managing Water in the West*

# Final Environmental Assessment – Lewiston Power Plant Replacement Trinity County, California

**Central Valley Project, CA**
**Mid-Pacific Region**

**U.S. Department of the Interior**
**Bureau of Reclamation**

**September 2011**

**FINAL**

# ENVIRONMENTAL ASSESSMENT

# LEWISTON POWERPLANT REPLACEMENT
# TRINITY COUNTY, CALIFORNIA

**U.S. Department of the Interior**
**Bureau of Reclamation**
**Mid-Pacific Region**
**Northern California Area Office**
**Redding, California**

**September 2011**

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AAQS | Ambient Air Quality Standards |
| AHPA | Archaeological and Historic Preservation Act |
| APE | area of potential effects |
| AWAs | anti-washout admixtures |
| BLM | Bureau of Land Management |
| BMPs | Best Management Practices |
| Cal-OSHA | California Occupational Safety and Health Administration |
| CDFG | California Department of Fish and Game |
| CFR | Code of Federal Regulations |
| cfs | cubic feet (or foot) per second |
| CSC | California Species of Concern |
| CVP | Central Valley Project |
| CVPIA | Central Valley Project Improvement Act |
| dB | decibel scale |
| DO | dissolved oxygen |
| DOI | Department of the Interior |
| DPS | Distinct Population Segment |
| EA | Environmental Assessment |
| ESA | Endangered Species Act |
| EIS | Environmental Impact Statement |
| ESU | Evolutionary Significant Unit |
| FC | Federal Candidate |
| FD | Federal Delisted |
| FE | Federal Endangered |
| FP | fully protected |
| FSS | USFS Sensitive |
| FT | Federal Threatened |
| FONSI | Finding of no significant impact |
| fps | foot/feet per second |
| GWh | gigawatt-hour(s) |
| kV | kilovolt(s) |
| kW | kilowatt(s) |
| kWh | kilowatt-hour(s) |
| LPPA | Lease of Power Privilege Agreement |
| mg/l | milligram per liter |
| MW | megawatt(s) |
| NCAB | North Coast Air Basin |
| NCRWQCB | North Coast Regional Water Quality Control Board |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NOAA | National Oceanic and Atmospheric Administration |
| NRCS | Natural Resources Conservation Service |
| NRHP | National Register of Historic Places |
| O&M | operation & maintenance |

| | |
|---|---|
| OCAP | operating criteria and procedures |
| PM10 | particulate matter less than 10 microns in aerodynamic diameter |
| ROD | Record of Decision |
| SC | Federal Species of Concern |
| SE | State Endangered |
| SFP | State fully protected |
| SHPO | State Historic Preservation Office |
| SPCCP | Spill Prevention, Containment and Countermeasure Plan |
| Sunrise | Sunrise Engineering, Inc. |
| SWPPP | Stormwater Pollution Prevention Plan |
| TRD | Trinity River Division |
| TRRP | Trinity River Restoration Program |
| TPUD | Trinity Public Utilities District |
| USACE | U.S. Army Corps of Engineers |
| USBR | U.S. Bureau of Reclamation |
| USDA | U.S. Department of Agriculture |
| USFS | U.S. Forest Service |
| USFWS | U.S. Fish and Wildlife Service |
| WBWG | Western Bat Working Group |

# CHAPTER 1 – INTRODUCTION AND NEED FOR PROPOSED ACTION

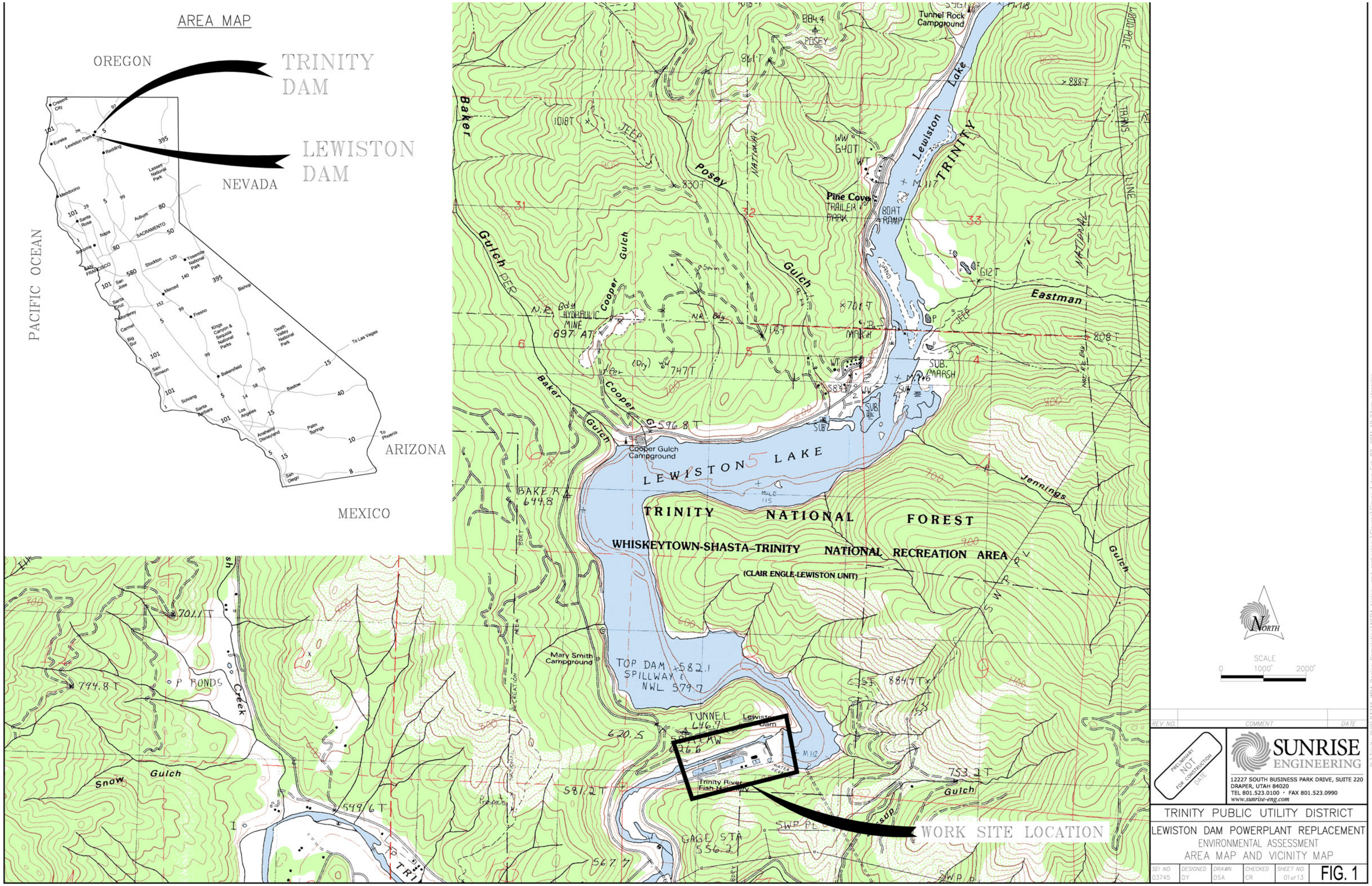
## 1.1 Introduction

This Environmental Assessment (EA) has been prepared to analyze the effects on the human environment of the proposed Lewiston Dam powerplant replacement project proposed by the Trinity Public Utilities District (TPUD), the project Proponent. The Proponent has proposed to replace an existing 350-kilowatt (kW) hydroelectric powerplant at the Lewiston Dam on the Trinity River in Trinity County, California with a 2.2-megawatt (MW) powperplant. The proposed project is located in the geographic locale of Section 8, Township 33 North, Range 8 West, Mt. Diablo Meridian Baseline, as shown in **Figure 1**. The proposed action would consist of demolition of the existing 350-kW powerhouse, construction of a new powerhouse at the same location as the existing plant with an installed capacity of approximately 2.2 MW, installation of a new siphon penstock and new intake structure through the left abutment of the dam and reconfiguration of the tailrace. The project area is comprised of public land and facilities administered by the U.S. Department of the Interior (DOI) Bureau of Reclamation (USBR).

The EA assists the USBR in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any "significant" impacts could result from the analyzed actions. "Significance" is defined by the NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of "Finding of No Significant Impact" (FONSI).

## 1.2 Background

The Lewiston Dam was constructed by the USBR from 1960 to 1963 and is located on the Trinity River, the longest tributary of the Klamath River in northern California. Funds for the project were authorized by the Emergency Relief Appropriation Act of 1935. The Lewiston Dam is part of the Trinity River Division (TRD), which is a division of the Central Valley Project (CVP) in the northern Sacramento Valley. The primary purpose of the division is to reroute water from the upper Trinity River watershed to the Sacramento River drainage downstream of Shasta Dam. The division provides water to the Sacramento River basin by diverting water at the Lewiston Dam into the Clear Creek Tunnel, and into Whiskeytown Lake on Clear Creek. A total installed capacity of 154 MW of hydroelectric power generation is produced in the process.


AREA MAP
OREGON
TRINITY DAM
LEWISTON DAM
NEVADA
PACIFIC OCEAN
ARIZONA
MEXICO
LEWISTON LAKE
TRINITY NATIONAL FOREST
WHISKEYTOWN-SHASTA-TRINITY NATIONAL RECREATION AREA
(CLAIR ENGLE-LEWISTON UNIT)
Cooper Gulch Campground
Mary Smith Campground
Tunnel Rock Campground
Pine Cove TRAILER PARK
TOP DAM 582.1
SPILLWAY 582.1
NWL 579.7
Trinity River Fish Hatchery
WORK SITE LOCATION
NORTH
SCALE
0 1000' 2000'
SUNRISE ENGINEERING
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DRAPER, UTAH 84020
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LEWISTON DAM POWERPLANT REPLACEMENT
ENVIRONMENTAL ASSESSMENT
AREA MAP AND VICINITY MAP
FIG. 1

According to the Record of Decision (ROD) for the Trinity River Restoration Program (TRRP) (DOI, 2000), historically, hundreds of thousands of salmon and steelhead would enter the Klamath estuary and migrate upstream during several months of the year. After traveling through the lower 44 miles of the Klamath River, many of these fish would turn south at the confluence of the Trinity River and continue their journey to the middle and upper Trinity River and its tributaries. Adult salmon and steelhead would spawn in November through May in the clean gravel of the mainstream Trinity and several of its tributaries. Millions of young salmonids would then emerge from the gravel between January and June and rear in the diversity of habitats in the river. The young of some species would begin their downstream migration to the Pacific Ocean within just a few months. Others remained in the river for a year or more before beginning their downstream migration. All of these fish would grow as they moved downstream through the Trinity River, lower Klamath River and Klamath estuary, undergoing physiological changes in preparation for life in the ocean. Suitable habitat and water quality are critical for the young salmon and steelhead during every stage of their outmigration in order for them to grow and become physically able to tolerate the transition to ocean life. After several years in the ocean, fish return to the Klamath River as adults and once again begin the upstream migration to the Trinity River to spawn in their natal stream. However, the once bountiful runs of salmon and steelhead in the Trinity River experienced significant declines following the construction and operation of the TRD in the early 1960s. The TRD not only eliminated 109 miles of important salmonid habitat above Lewiston, California, but also exported to the Sacramento River as much as 90% of the upper watershed yield at Lewiston, California. As a mitigation measure, the Trinity River Fish Hatchery was constructed, as part of the TRD. The fish hatchery is located immediately downstream of the Lewiston Reservoir. With a capacity of about 40 million eggs, the hatchery mitigates the loss of upstream salmon spawning areas rendered inaccessible by the Lewiston Dam and other structures located upstream (i.e., Trinity Dam).

The Lewiston Dam is a zoned earth-fill structure 91 feet high, 25 feet wide at the crest, and 754 feet long. Located at the right abutment is a spillway controlled by two 30-foot by 27.5-foot radial gates with a combined discharge capacity of 30,000 cubic feet per second (cfs). The dam forms a 14,600 acre-foot reservoir and builds a static head of 66 feet.

The existing 350-kW Lewiston Powerplant at the toe of the dam has been operated in conjunction with the spillway gates to maintain the mandated flow in the Trinity River downstream of the dam. The Francis turbine at the plant is normally set at maximum output with the spillway gates adjusted to regulate the river flow. The facility provides power to the adjacent Trinity River Fish Hatchery. Energy in excess of the hatchery loads has been sold to Pacific Gas and Electric. The existing conventional powerhouse is aboveground. The rated hydraulic head is 60 feet and the current flow used for power generation is 100 cfs. Water is diverted to the turbine in the powerhouse through a 322-foot long penstock connected to a 12-foot wide by 12-foot long by 14-foot high intake structure with trash racks located at the bottom of the reservoir. The penstock consists of two sections: (a) 179 feet of 4-foot diameter concrete upper section and (b) 143 feet of 4-foot diameter steel penstock lower section. The two sections are connected through a 22.75-foot high and 10-foot diameter cylindrical gate chamber. The steel penstock section is housed in an 8-foot horseshoe-shaped tunnel from the gate chamber to the toe of the dam. The penstock is bifurcated at the lower end to a bypass facility with a discharge capacity of 325 cfs and to the 350-kW turbine in the powerhouse. The 350-kW powerplant was designed and constructed to use 100 cfs for power generation based on the original minimum flow released from the reservoir into the Trinity River. The water used to generate power through the turbine discharges to a tailrace where the hatchery fish ladder discharges to the Trinity River, as shown in **Illustration 1**. The fish ladder is operated between Labor Day weekend and March 15 of the following year.


**Illustration 1. Location of Fish Ladder, Tailrace and Spillway**

Due to environmental impacts and concerns associated with the original minimum flows released from the Lewiston Reservoir into the Trinity River, studies were conducted and the minimum flow released from the Lewiston Reservoir was increased pursuant to the TRRP ROD (DOI, 2000). Five potential annual flow regimes were developed at the dam: extremely wet, wet, normal, dry and critically dry. In all five flow regimes, the minimum discharge is 300 cfs and occurs during winter months. A maximum flow of 11,000 cfs is expected to occur in late-May under the extremely wet flow regime. Only 100 cfs of the daily discharge has been utilized for power generation at the existing 350-kW powerplant, generating electricity of approximately 3,335,000 kW-hours (kWh) annually. The remaining flow has to be discharged into the river downstream of the powerplant through the existing penstock and bypass facility near the turbine and/or the spillway. The increased minimum flow from the Lewiston Reservoir allows for more power generation if the turbine-generator unit and penstock are increased in size.

In 2009, the USBR and the TPUD signed a Lease of Power Privilege Agreement (LPPA) for the Lewiston Hydroelectric Project. Under the LPPA, the TPUD could replace the existing powerplant with a design approved by the USBR.

## 1.3 Purpose of and Need for the Proposed Action

The purpose of the proposed project is to generate more hydropower from part or all of the available reservoir discharge presently bypassing the turbine or passing through the spillway.

The feasibility to economically generate more electricity at the Lewiston Dam site was supported by the Available Generation Capacity Study completed by the USBR in 2001, and further confirmed by the Feasibility Evaluation completed by Sunrise Engineering (Sunrise) in November 2009 and the Final Value Planning report by the USBR in June 2010. Evaluations by Sunrise indicate that the existing powerplant can be replaced with a new powerplant having an installed capacity of 2.2 MW (two 1.1-MW Francis units) with an annual power generation of approximately 13,000,000 kWh for the best economic benefit.

The proposed project would decrease the number of required days annually that the spillway is utilized by bypassing more of the available reservoir discharge through the turbine for additional hydropower generation.

## 1.4 Authorizing Actions, Permits and Licenses

Implementation of the proposed action would require a number of authorizations or permits from federal and state agencies as follows:

- Authorization from the USBR would be needed to construct and maintain the project on federal facilities.
- A permit may be needed from the U.S. Army Corps of Engineers (USACE) in compliance with Section 404 of the Clean Water Act.
- Water quality certification or waiver would be needed from the California North Coast Regional Water Quality Control Board (NCRWQCB) pursuant to Section 401 of the Clean Water Act.
- Federal and state Endangered Species Act (ESA) compliance

## 1.5 Relationship to Other Projects

Construction and operation of the proposed project would have to be in compliance with the regulated release from the Lewiston Reservoir and the operation of the Trinity River Fish Hatchery. This is addressed in more detail in later sections.

# CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

## 2.1 Introduction

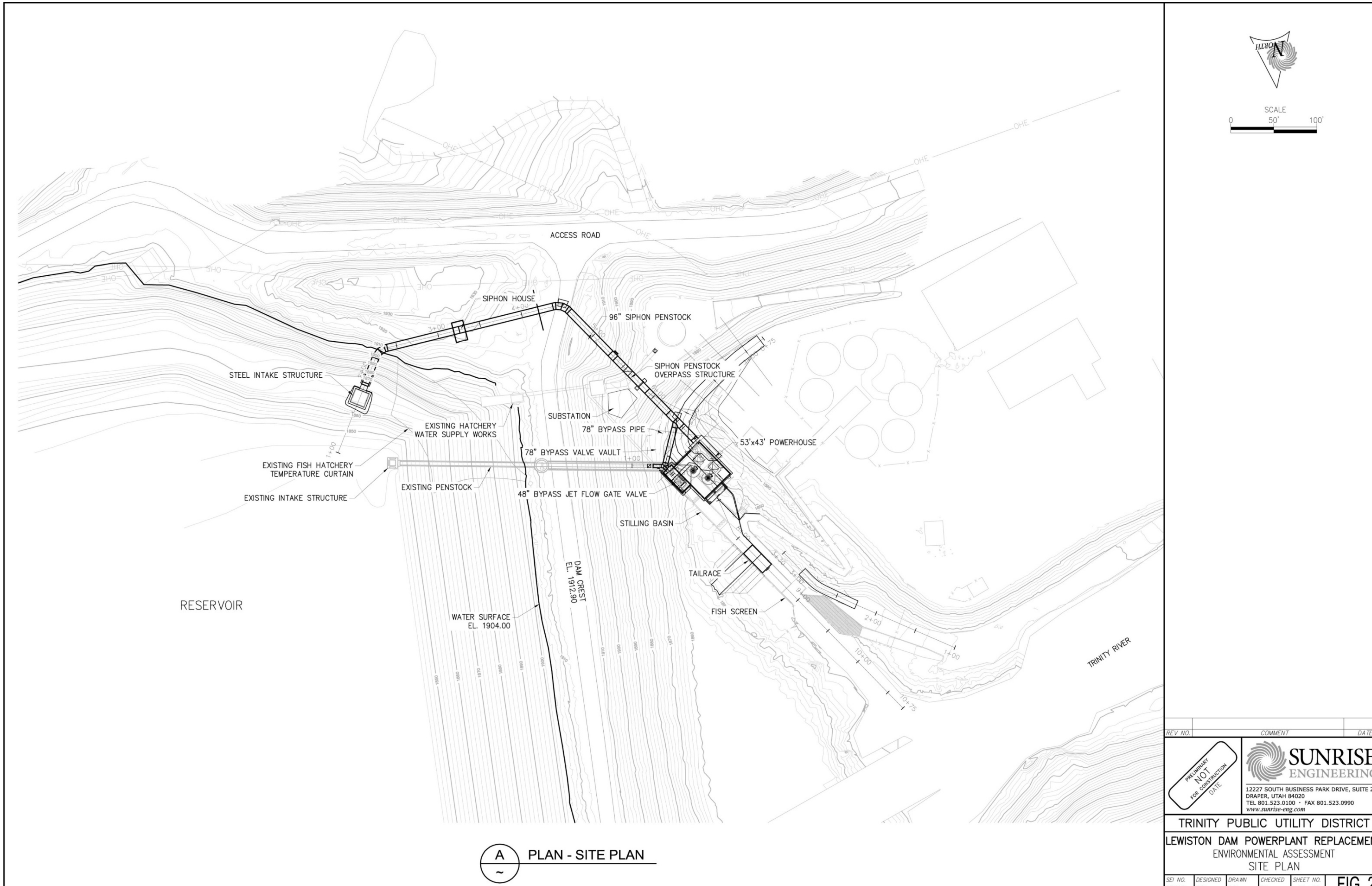
This chapter focuses on the proposed action and a no action alternative. The no action alternative is considered and analyzed to provide a baseline for comparison of the impacts of the proposed action. Other action alternatives were also considered, but were eliminated from detailed analysis. Brief discussions are provided to explain why they are not considered further. These represent a range of reasonable alternatives to meet the objective for the action.

## 2.2 Proposed Action

The proposed action would consist of demolishing the existing powerplant and constructing a new powerplant with an installed capacity of 2.2 MW (two 1.1-MW Francis units). The new powerplant would be at the same location as the existing plant and on land previously disturbed or affected during construction of the Lewiston Dam and powerplant in the 1960s, as shown in **Figure 2**.

The west side of the existing tailrace would be re-configured to be hydraulically conducive to the new draft tube location. The bypass valve would be placed at the same location as the existing plant to use the existing stilling basin. The tailrace reconfiguration would include widening of the tailrace floor and reconstruction of the west wall which ties into the fish ladder. The new dual-level powerhouse would have a similar configuration to the existing powerhouse. There would be a spiral case on the lower level and the generators would be installed near the high water level on the upper floor. The turbines would be installed in the lower level. The governors and other controls would be more compact than the existing unit and would be located on the upper floor with the generators. The powerhouse would be approximately 43 feet by 53 feet in horizontal dimension, as shown in **Figure 3**. The structural depth from the generator floor to the bottom of the draft tube would be approximately 26 feet, as shown in **Figure 4**. The west wall of the powerhouse would be constructed to act as a retaining wall to maintain the level of the fish hatchery on the west side. The underflow structure/fish screen would be modified to provide increased capacity for the higher bypass flows.

Upstream of the powerhouse, a penstock bifurcation would be installed to provide a bypass line for the powerhouse flow. The bifurcation would lead to a valve house on the same level as the spiral case that would house a motor controlled jet flow gate. This gate would discharge bypass flow during periods in which the generators are not operating. The bypass would discharge into the tailrace just under the tailwater level. A backup water supply connection to the hatchery from the new penstock would be installed. The exact location has not been determined.


NORTH
SCALE
0
50'
100'
ACCESS ROAD
SIPHON HOUSE
96" SIPHON PENSTOCK
STEEL INTAKE STRUCTURE
SIPHON PENSTOCK
OVERPASS STRUCTURE
SUBSTATION
78" BYPASS PIPE
EXISTING HATCHERY
WATER SUPPLY WORKS
53'x43' POWERHOUSE
78" BYPASS VALVE VAULT
EXISTING FISH HATCHERY
TEMPERATURE CURTAIN
EXISTING PENSTOCK
EXISTING INTAKE STRUCTURE
48" BYPASS JET FLOW GATE VALVE
STILLING BASIN
TAILRACE
DAM CREST
EL. 1912.90
RESERVOIR
WATER SURFACE
EL. 1904.00
FISH SCREEN
TRINITY RIVER
A PLAN - SITE PLAN
REV NO.
COMMENT
DATE
PRELIMINARY
NOT
FOR CONSTRUCTION
DATE
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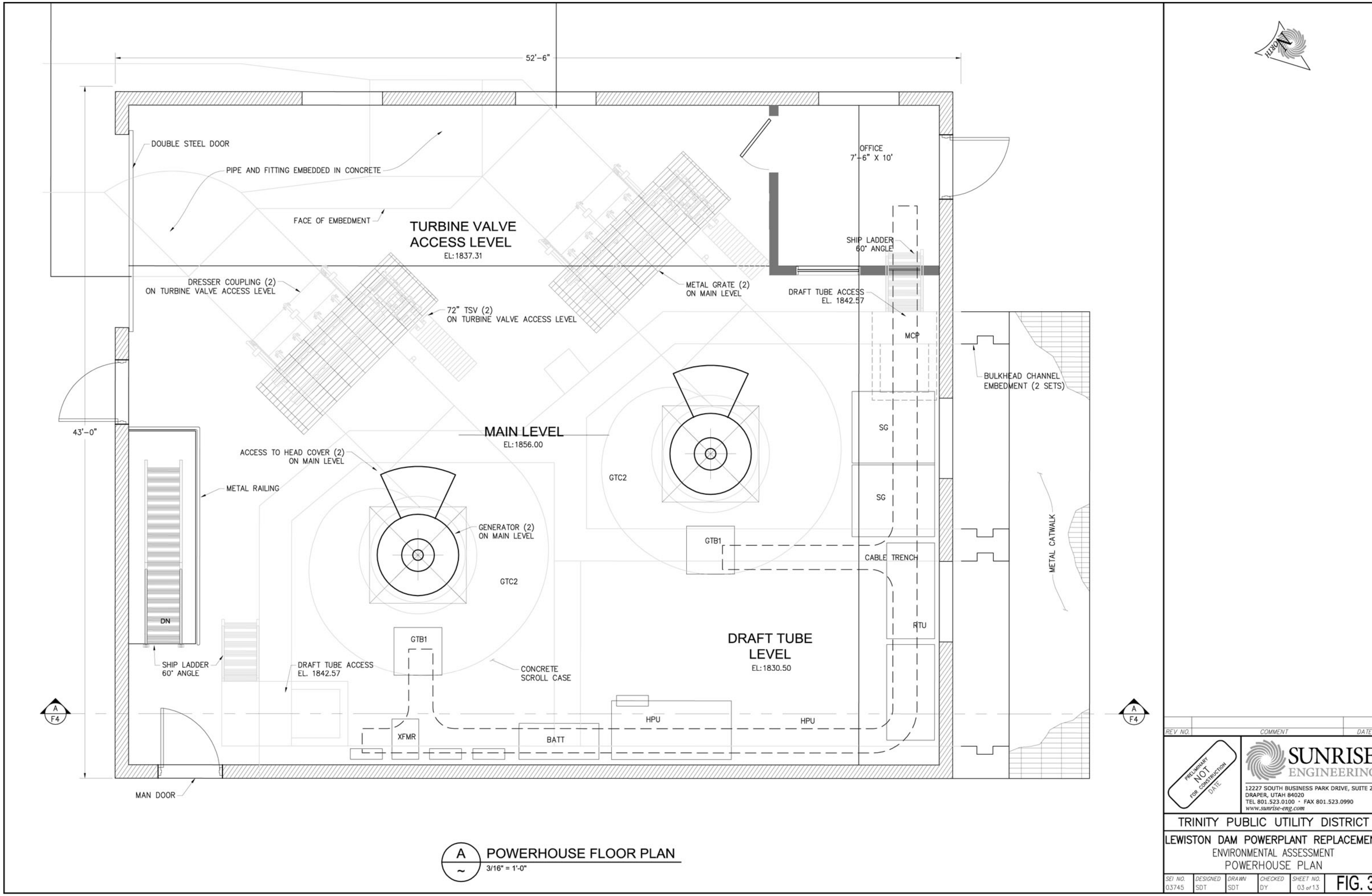
LEWISTON DAM POWERPLANT REPLACEMENT
ENVIRONMENTAL ASSESSMENT
SITE PLAN
SEI NO. 03745
DESIGNED DSA
DRAWN DSA
CHECKED DY
SHEET NO. 02 of 13
FIG. 2


52'-6"
43'-0"
DOUBLE STEEL DOOR
PIPE AND FITTING EMBEDDED IN CONCRETE
FACE OF EMBEDMENT
TURBINE VALVE ACCESS LEVEL
EL: 1837.31
OFFICE
7'-6" X 10'
SHIP LADDER
60° ANGLE
DRESSER COUPLING (2)
ON TURBINE VALVE ACCESS LEVEL
METAL GRATE (2)
ON MAIN LEVEL
DRAFT TUBE ACCESS
EL. 1842.57
72" TSV (2)
ON TURBINE VALVE ACCESS LEVEL
MCP
BULKHEAD CHANNEL
EMBEDMENT (2 SETS)
MAIN LEVEL
EL: 1856.00
ACCESS TO HEAD COVER (2)
ON MAIN LEVEL
METAL RAILING
GTC2
SG
SG
GENERATOR (2)
ON MAIN LEVEL
GTB1
CABLE TRENCH
METAL CATWALK
GTC2
DN
RTU
DRAFT TUBE LEVEL
EL: 1830.50
GTB1
SHIP LADDER
60° ANGLE
DRAFT TUBE ACCESS
EL. 1842.57
CONCRETE
SCROLL CASE
A
F4
HPU
HPU
XFMR
BATT
A
F4
MAN DOOR
A POWERHOUSE FLOOR PLAN
3/16" = 1'-0"
NORTH
REV NO.
COMMENT
DATE
PRELIMINARY NOT FOR CONSTRUCTION DATE
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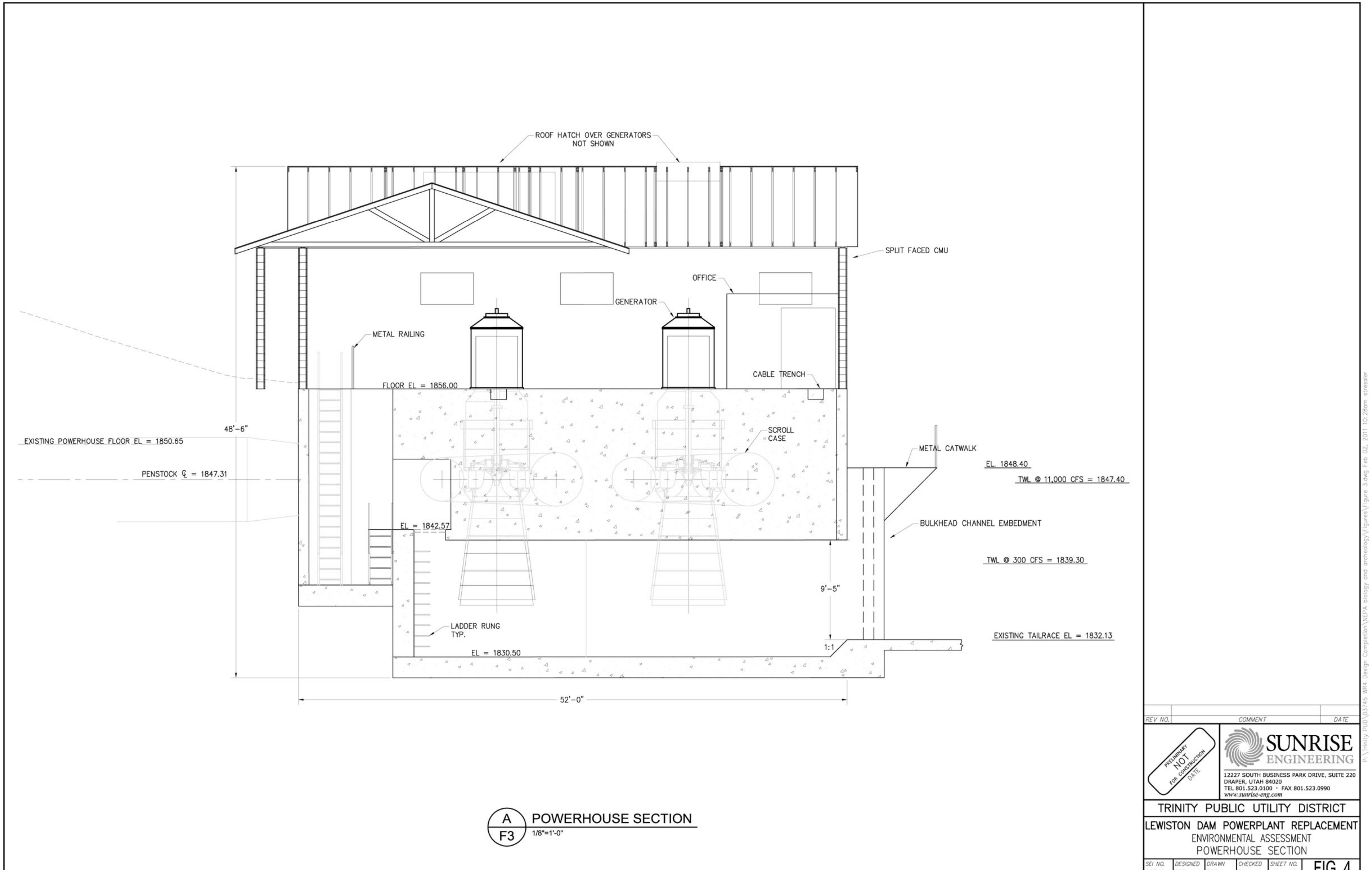
POWERHOUSE PLAN
SEI NO. 03745
DESIGNED SDT
DRAWN SDT
CHECKED DY
SHEET NO. 03 of 13
FIG. 3


ROOF HATCH OVER GENERATORS NOT SHOWN
SPLIT FACED CMU
OFFICE
GENERATOR
METAL RAILING
CABLE TRENCH
FLOOR EL = 1856.00
SCROLL CASE
48'-6"
EXISTING POWERHOUSE FLOOR EL = 1850.65
PENSTOCK ℄ = 1847.31
METAL CATWALK
EL. 1848.40
TWL @ 11,000 CFS = 1847.40
BULKHEAD CHANNEL EMBEDMENT
EL = 1842.57
TWL @ 300 CFS = 1839.30
9'-5"
LADDER RUNG TYP.
EXISTING TAILRACE EL = 1832.13
1:1
EL = 1830.50
52'-0"
A
F3
POWERHOUSE SECTION
1/8"=1'-0"
REV NO.
COMMENT
DATE
PRELIMINARY NOT FOR CONSTRUCTION DATE
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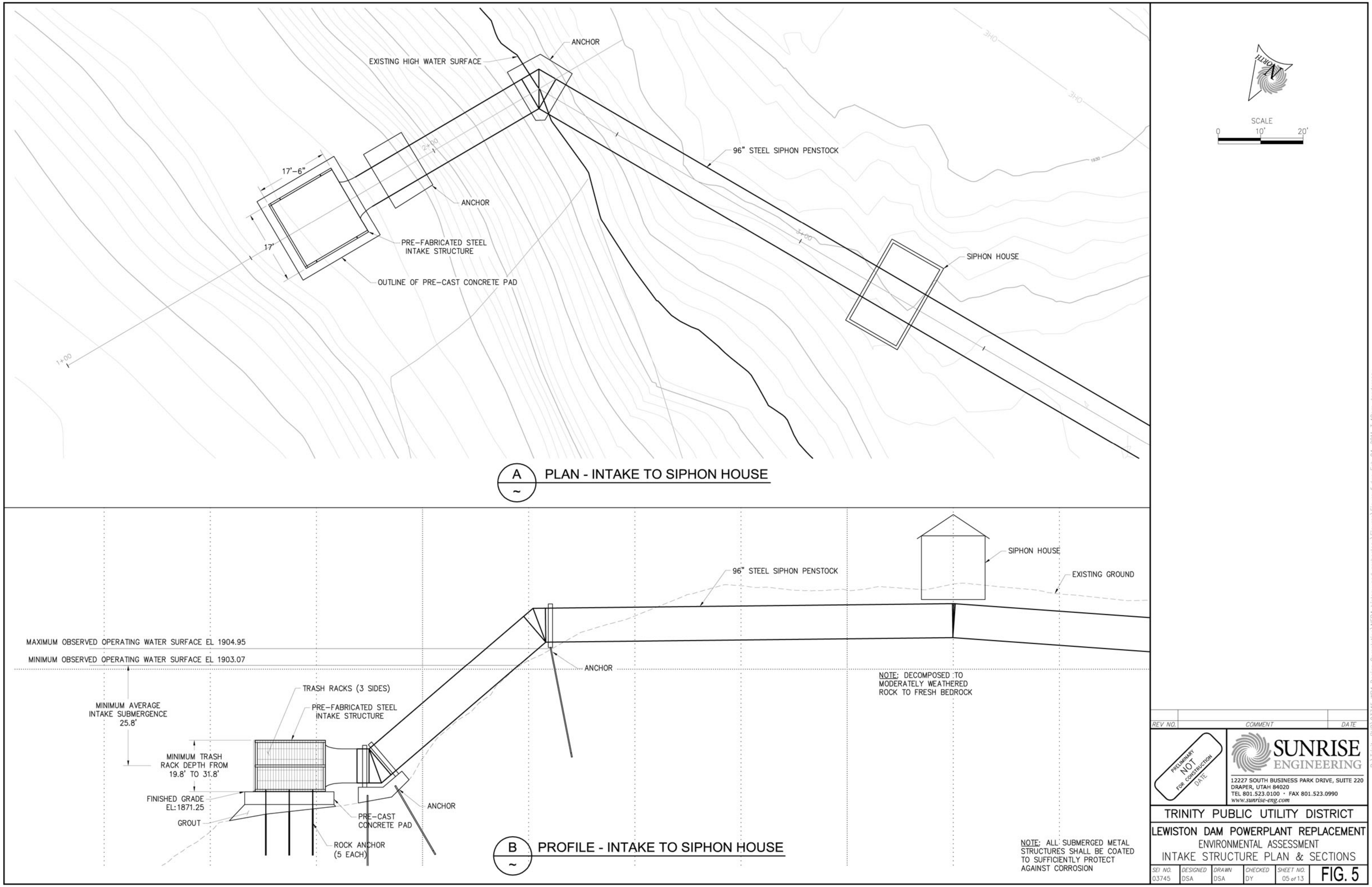
ENVIRONMENTAL ASSESSMENT
POWERHOUSE SECTION
SEI NO. 03745
DESIGNED SDT
DRAWN SDT
CHECKED DY
SHEET NO. 04 of 13
FIG. 4

A new intake structure would be constructed on the south bank of the reservoir just upstream of the left dam abutment and outside the hatchery intake temperature curtain as shown in **Figure 2**. The steel frame structure would be 17.5 feet long, 17 feet wide and 12 feet high with trash racks on three sides. The dimension of the intake structure was selected based on the flow approach velocity of 1.0 foot per second (fps). The intake structure would be installed on an existing bench approximately 38 feet below the average lake level. Prior to installation of the intake structure, the location of the pad would be cleared of any mud, silt or debris to expose the underlying bedrock. The pre-cast concrete pad would be lowered by a crane and anchored to the bedrock floor of the bench, leveled, and then concrete would be pumped to fill the voids between the pre-cast pad and the bedrock floor. In underwater concrete, anti-washout admixtures (AWAs) would be used to increase cohesiveness of the concrete to prevent excessive washing out of cement components. AWAs can be made from various organic and inorganic materials. Two commonly used materials are cellulose and gum, which act primarily by increasing the viscosity and the water retention of the cement paste. For underwater concrete, water reducing admixtures are usually necessary as well. The environmental advantages of using AWAs are: (1) there would be minimal environmental impact associated with cement washout and (2) there would be no need for constructing a cofferdam and dewatering during underwater construction. Once the pad is in place, the bottom of the intake structure would be anchored to the concrete pad. The bottom of the structure would be at an elevation of 1,871.25 feet and the top 1,883.25 feet with a minimum average submergence of 25.8 feet when compared to the minimum operating water surface elevation of 1,903.07 feet, as shown in **Figure 5**. The new steel penstock, 96 inches in diameter and approximately 460 feet in length, would connect to the back of the intake structure. As shown in **Figure 5**, the steel penstock would run through a siphon house on the left abutment. The purpose of the siphon house on the left abutment would be to avoid any potential health and safety risks associated with the Lewiston Dam, and facilitate startup and maintain proper penstock operations under negative pressures ranging from 10.55 feet (relative to the maximum operating level of 1,904.95 feet) to 12.43 feet (relative to the minimum operating level of 1,903.07 feet). The penstock would be buried 3 to 7 feet below existing ground surface with the exception that a 65-foot aboveground segment would overpass the fish hatchery water supply works (refer to **Figures 2 and 6**).

Because of the increased capacity of the new powerplant, a larger capacity substation would replace the existing substation. The location of the new substation is shown in **Figure 2**. The existing 12-kV power transmission line has enough capacity for the new powerplant and would continue to be used for the proposed project.

The proposed action would minimize friction loss through the new larger penstock. The 96-inch diameter was chosen based on a preliminary cost-benefit analysis. The rated flow would be 480 cfs. With the increased diameter of the new penstock, the maximum hydraulic loss would be 4.5 feet at full capacity. The minimum net hydraulic head would be 57.6 feet. The annual power generation would be approximately 13 GWh.

Construction of the proposed project would disturb an estimated area of 0.65 acre. Excavation would result in the removal of an estimated 5,000 cubic yards of soil and rock. Excavated soil and rock would be stockpiled in the project staging areas initially. Some of the excavated soil and rock would be used for backfilling the penstock trench, powerhouse and tailrace excavation, and site grading, and the remainder would be properly disposed of.


ANCHOR
EXISTING HIGH WATER SURFACE
17'-6"
17'
ANCHOR
PRE-FABRICATED STEEL INTAKE STRUCTURE
OUTLINE OF PRE-CAST CONCRETE PAD
96" STEEL SIPHON PENSTOCK
SIPHON HOUSE
SCALE
0 10' 20'
A PLAN - INTAKE TO SIPHON HOUSE
SIPHON HOUSE
96" STEEL SIPHON PENSTOCK
EXISTING GROUND
MAXIMUM OBSERVED OPERATING WATER SURFACE EL 1904.95
MINIMUM OBSERVED OPERATING WATER SURFACE EL 1903.07
ANCHOR
NOTE: DECOMPOSED TO MODERATELY WEATHERED ROCK TO FRESH BEDROCK
TRASH RACKS (3 SIDES)
PRE-FABRICATED STEEL INTAKE STRUCTURE
MINIMUM AVERAGE INTAKE SUBMERGENCE 25.8'
MINIMUM TRASH RACK DEPTH FROM 19.8' TO 31.8'
FINISHED GRADE EL:1871.25
GROUT
PRE-CAST CONCRETE PAD
ANCHOR
ROCK ANCHOR (5 EACH)
B PROFILE - INTAKE TO SIPHON HOUSE
NOTE: ALL SUBMERGED METAL STRUCTURES SHALL BE COATED TO SUFFICIENTLY PROTECT AGAINST CORROSION
REV NO. COMMENT DATE
PRELIMINARY NOT FOR CONSTRUCTION DATE
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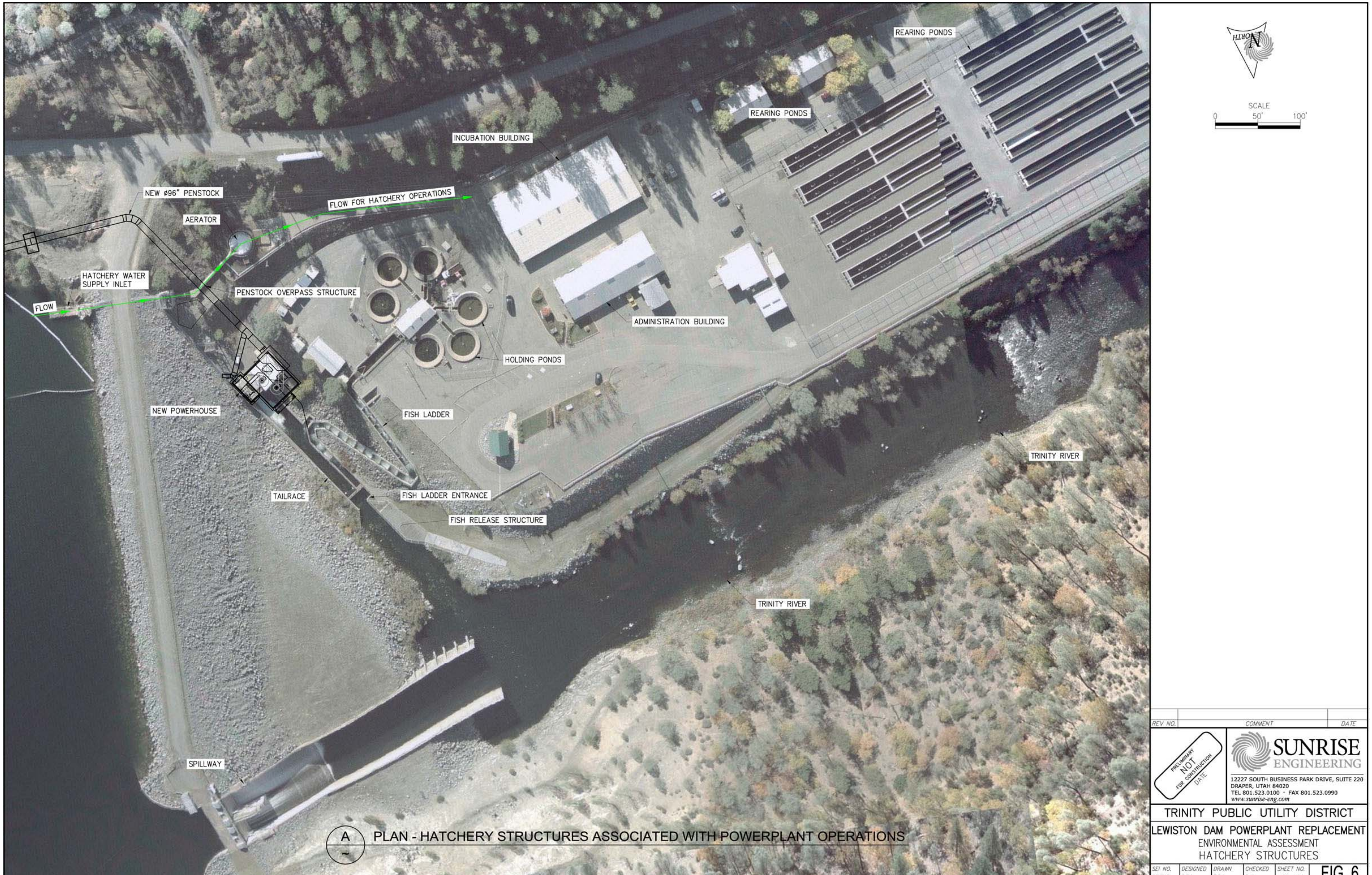
INTAKE STRUCTURE PLAN & SECTIONS
SEI NO. 03745 DESIGNED DSA DRAWN DSA CHECKED DY SHEET NO. 05 of 13
FIG. 5



REARING PONDS
REARING PONDS
INCUBATION BUILDING
NEW ø96" PENSTOCK
FLOW FOR HATCHERY OPERATIONS
AERATOR
HATCHERY WATER SUPPLY INLET
FLOW
PENSTOCK OVERPASS STRUCTURE
ADMINISTRATION BUILDING
HOLDING PONDS
NEW POWERHOUSE
FISH LADDER
TRINITY RIVER
TAILRACE
FISH LADDER ENTRANCE
FISH RELEASE STRUCTURE
TRINITY RIVER
SPILLWAY
A PLAN - HATCHERY STRUCTURES ASSOCIATED WITH POWERPLANT OPERATIONS
NORTH
SCALE
0 50' 100'
REV NO. COMMENT DATE
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ENVIRONMENTAL ASSESSMENT
HATCHERY STRUCTURES
SEI NO. 03745
DESIGNED DSA
DRAWN DSA
CHECKED DY
SHEET NO. 06 of 14
FIG. 6

**Figure 7** is a demolition plan that shows certain existing structures would be removed. The construction debris from demolition of the existing powerhouse and other structures would first be stockpiled in the project staging areas and later trucked to a certified landfill closest to the site for disposal.

The 350-kW turbine-generator unit and associated appurtenances in the existing powerhouse would be collected for the USBR's disposal or reuse. USBR would provide a truck at the time of demolition to remove the turbine-generator unit and associated appurtenances from the site.

### *2.2.1 Staging Area and Access Road*

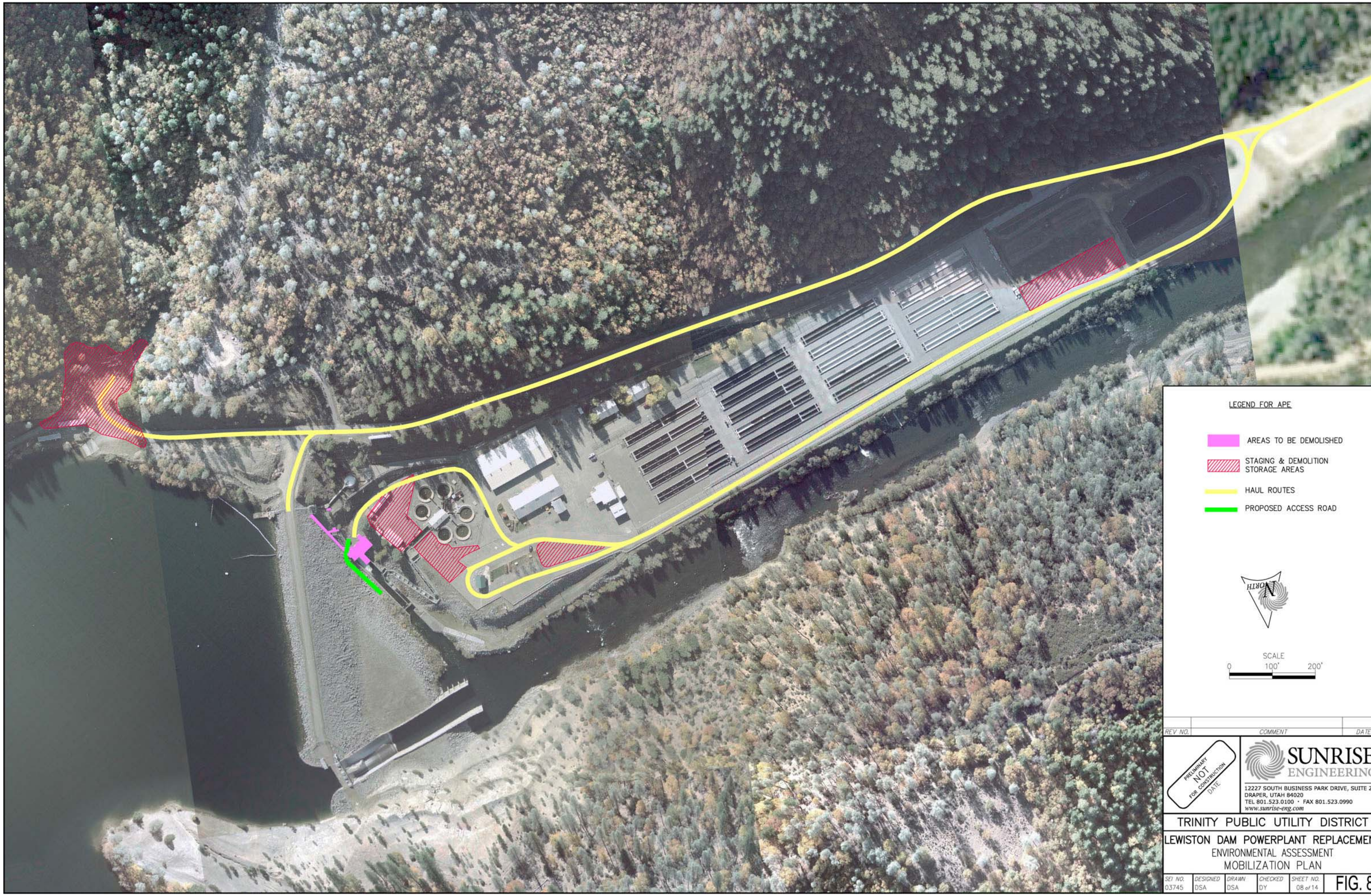
Multiple staging areas are proposed and would be located adjacent to the existing powerhouse, near the hatchery parking lot, at the west end of the hatchery and adjacent to the access road to the dam in the left abutment, as shown in **Figure 8**. The staging areas cover a combined area of approximately 2.0 acres. Trucks hauling equipment and construction materials to the largest staging area along the left abutment would drive east along the main road past the area, back into the area to stockpile materials, then continue west down the main road. There would be enough room for trucks to turn around in the staging areas without causing additional surface disturbance.

Access from Lewiston would be by means of Trinity Dam Boulevard, Deadwood Road and Hatchery Road. Hatchery Road branches into two just before it reaches the hatchery with one branch leading to the existing powerplant and proposed staging areas where part of the proposed project construction would occur and the other to the dam, a proposed staging area and the other construction zone for the intake structure and siphon penstock. A small 10- to 12-foot wide road would be constructed of fill material along the dam embankment to access the east side of the existing powerhouse and tailrace area (see **Figure 8**). The road would be a reconstruction of a road that was built previously to conduct drilling along the embankment and at the toe of the dam. Once construction activities are complete, the area impacted by the road would be reclaimed if deemed necessary by the USBR. Any additional road improvements would not be required for site access during construction and operation of the new generator facility. After construction is complete, road repair may be required.

### *2.2.2 Project Construction*

Construction activities would entail using large cranes, pickup trucks, flat bed trucks, dump trucks, cement trucks, excavators and bulldozers. Controlled blasting may be required for rock excavation in the areas for the powerhouse, tailrace and the penstock at the left abutment. A cofferdam would be installed just upstream of the underflow structure/fish screen to facilitate the powerhouse and tailrace construction (see **Illustration 2**). The exact location of the cofferdam will be decided as the final design is completed. Unwatering would be required for construction of the powerhouse and tailrace.


CONCRETE PIPE AND STRUCTURES TO BE PROTECTED
48" STEEL FISH HATCHERY PIPE TO BE PROTECTED
EXISTING CONDUITS ON GROUND TO BE REMOVED
UGE
TREE TO BE REMOVED
BUILDINGS TO BE REMOVED
METAL STAIRWAY TO BE REMOVED
PENSTOCK TO BE REMOVED TO THE SECOND FLANGED JOINT INSIDE TUNNEL.
POWERHOUSE TO BE REMOVED (SEE NOTE 3)
WEST TAILRACE AREA TO BE REMOVED
FISH LADDER TO BE PROTECTED
EAST TAILRACE AREA TO BE PROTECTED
TAIL RACE TO BE PROTECTED
A PLAN - DEMOLITION PLAN
NORTH
N
SCALE
0 10' 20'
DEMOLITION GENERAL NOTES
1. CARE SHALL BE EXERCISED DURING DEMOLITION TO ASSURE THAT ADJACENT FACILITIES OR STRUCTURES, WHICH ARE TO REMAIN, ARE NOT DISTURBED. ANY DAMAGE TO SUCH EXISTING FACILITIES OR STRUCTURES RESULTING FROM CARELESSNESS OR NEGLIGENCE ON THE CONTRACTOR'S PART SHALL BE SATISFACTORILY RESTORED TO NEW CONDITION AT THE CONTRACTOR'S EXPENSE.
2. ALL MATERIALS THAT ARE NOT SALVAGED BY TPUD OR USBR SHALL BE DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL LAWS, AND WILL NOT BE PERMITTED IN THE BACKFILL, EXCEPT AS SPECIFICALLY AUTHORIZED BY THE ENGINEER AND IN ACCORDANCE WITH LOCAL CODES.
3. DURING DEMOLITION OF THE EXISTING FACILITIES, THE CONTRACTOR SHALL TURN OVER TO THE USBR (AT THE SITE) THE MAJOR COMPONENTS OF THE EXISTING POWER HOUSE TO INCLUDE, BUT NOT BE LIMITED TO THE ARMATURE WINDING, TURBINE, AND SCROLL CAGE, IN ORDER THAT THEIR SALVAGE VALUE BE RETAINED BY USBR.
4. ALL SALVAGE ITEMS SHALL BE MOVED TO THE DEMOLITION STORAGE AREAS VIA THE HAUL ROUTE SHOWN ON PLAN VIEW B ON FIGURE 7.
5. THE LOCATION OF EXISTING FEATURES AND UTILITIES HAS BEEN SHOWN TO THE BEST OF THE ENGINEERS ABILITY. THE CONTRACTOR SHALL HAVE THE ULTIMATE RESPONSIBILTY TO IDENTIFY, SAFELY DISCONNECT, AND REMOVE OR PROTECT EXISTING FEATURES AND UTILITIES.
LEGEND
AREAS TO BE DEMOLISHED
REV NO.
COMMENT
DATE
PRELIMINARY NOT FOR CONSTRUCTION DATE
SUNRISE ENGINEERING
12227 SOUTH BUSINESS PARK DRIVE, SUITE 220
DRAPER, UTAH 84020
TEL 801.523.0100 · FAX 801.523.0990
www.sunrise-eng.com
TRINITY PUBLIC UTILITY DISTRICT
LEWISTON DAM POWERPLANT REPLACEMENT
ENVIRONMENTAL ASSESSMENT
DEMOLITION PLAN
SEI NO. 03745
DESIGNED DSA
DRAWN DSA
CHECKED DY
SHEET NO. 07 of 14
FIG. 7


LEGEND FOR APE
AREAS TO BE DEMOLISHED
STAGING & DEMOLITION STORAGE AREAS
HAUL ROUTES
PROPOSED ACCESS ROAD
NORTH
SCALE
0
100'
200'
REV NO.
COMMENT
DATE
PRELIMINARY NOT FOR CONSTRUCTION DATE
SUNRISE ENGINEERING
12227 SOUTH BUSINESS PARK DRIVE, SUITE 220
DRAPER, UTAH 84020
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ENVIRONMENTAL ASSESSMENT
MOBILIZATION PLAN
SEI NO. 03745
DESIGNED DSA
DRAWN DSA
CHECKED DY
SHEET NO. 08 of 14
FIG. 8

Specification of construction procedures has not been completed at this stage of the project. However, a conventional construction process of approximately 14-month duration is anticipated for the proposed project. A general contractor would complete the work. Standard operating procedures approved by the USBR would be used to ensure compliance with all construction standards, and Best Management Practices (BMPs) would be employed (see Section 2.2.6). Construction inspection would be conducted by representatives from the USBR and the TPUD to ensure quality construction and environmental compliance. Construction would be implemented so as not to impede or modify operational releases from and operational water level of the Lewiston Reservoir, and access to and operation of the Trinity River Fish Hatchery. **Illustration 3** shows the proposed construction schedule for the project.

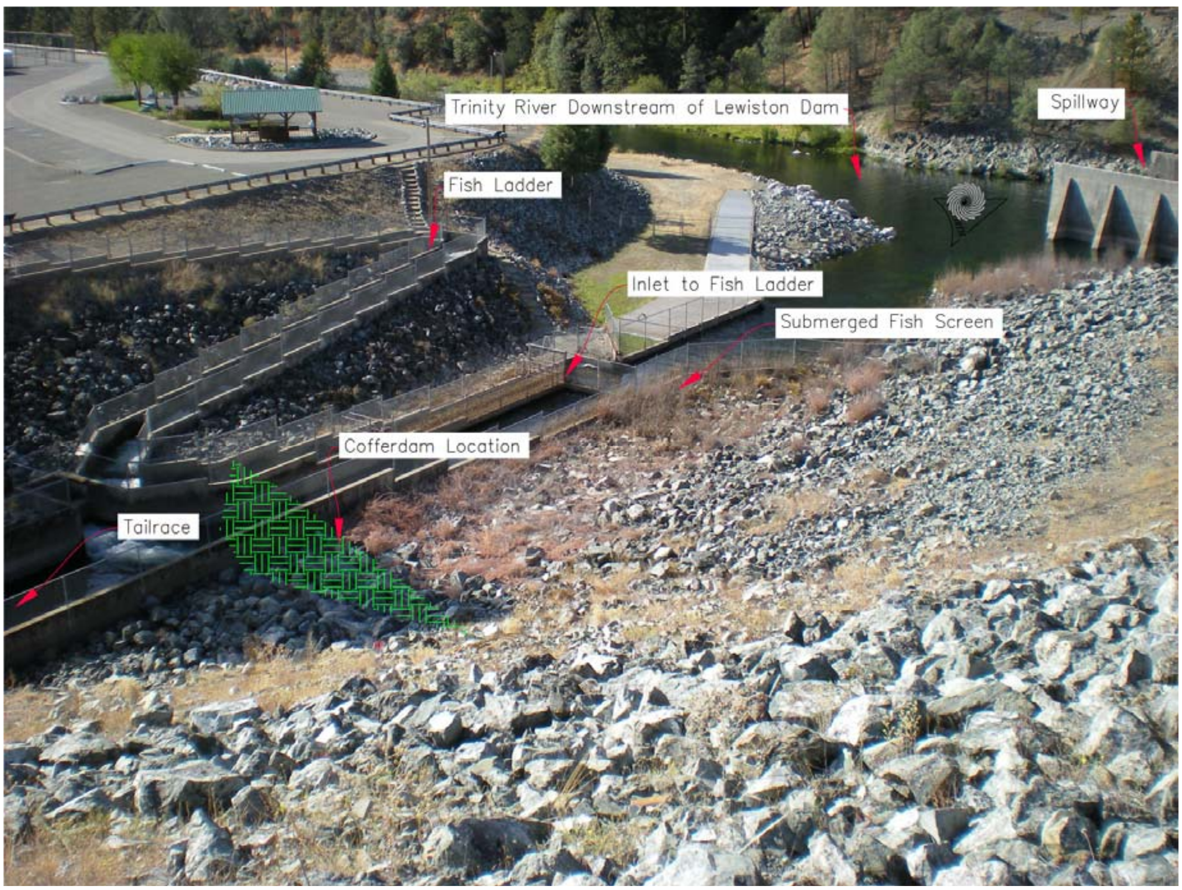



**Illustration 2. Approximate Cofferdam Location Relative to Other Structures**

The following briefly discusses interconnected and sometimes concurrent construction activities as outlined in **Illustration 3**:

1. **Preconstruction Activities**: Preconstruction activities would include the following:

- completion of NEPA, National Historic Preservation Act (NHPA) and ESA review processes
- major equipment procurement (this activity would extend into the construction phase)
- final design of the project and
- contractor selection

| Act ID | Description | Orig Dur | Rem Dur | Early Start | Early Finish |
|---|---|---|---|---|---|
| 1.0 | Preconstruction Activities | 210d | 210d | 01OCT10 | 22JUL11 |
| 1.1 | NEPA Review | 165d | 165d | 01OCT10 | 19MAY11 |
| 1.2 | Major Equipment Procurement | 295d | 295d | 20MAY11 | 09JUL12 |
| 1.2.1 | Manufacturer Selection and Contract | 20d | 20d | 20MAY11 | 16JUN11 |
| 1.2.2 | Manufacuture and Delivery | 280d | 280d | 17JUN11 | 16JUL12 |
| 1.3 | Final Design (from 30% to 100%) and Permitting | 200d | 200d | 01OCT10 | 08JUL11 |
| 1.4 | Contractor Selection | 20d | 20d | 11JUL11 | 05AUG11 |
| 2.0 | Construction Activities | 310d | 310d | 08AUG11 | 15OCT12 |
| 2.01 | Preconstruction Coordination and Meeting | 5d | 5d | 08AUG11 | 12AUG11 |
| 2.02 | Construction Equipment Mobilization to Site | 10d | 10d | 15AUG11 | 26AUG11 |
| 2.03 | Intermittent Construction Material Delivery | 220d | 220d | 29AUG11 | 29JUN12 |
| 2.04 | Site Preparation, Demolition and Disposal | 45d | 45d | 29AUG11 | 28OCT11 |
| 2.04.1 | Access Road (East of Powerhouse) Construction | 10d | 10d | 29AUG11 | 09SEP11 |
| 2.04.2 | Shoring for Embankment (East of Powerhouse) | 10d | 10d | 12SEP11 | 23SEP11 |
| 2.04.3 | Cofferdam Construction | 5d | 5d | 12SEP11 | 16SEP11 |
| 2.04.4 | Demolition and Disposal | 20d | 20d | 26SEP11 | 21OCT11 |
| 2.04.5 | Site Grading | 5d | 5d | 24OCT11 | 28OCT11 |
| 2.05 | Powerhouse/Tailrace Foundation Excavation | 40d | 40d | 24OCT11 | 16DEC11 |
| 2.06 | Penstock Trenching and Installation | 160d | 160d | 31OCT11 | 08JUN12 |
| 2.07 | Intake/Siphon House Construction | 75d | 75d | 11JUN12 | 24SEP12 |
| 2.08 | Powerhouse and Tailrace Construction | 180d | 180d | 19DEC11 | 27AUG12 |
| 2.09 | Electric and Controls | 75d | 75d | 17JUL12 | 29OCT12 |
| 2.10 | Removal of Cofferdam | 5d | 5d | 28AUG12 | 03SEP12 |
| 2.11 | Demobilization (Intermittent) | 90d | 90d | 11JUN12 | 15OCT12 |
| 3.0 | Testing and Startup | 40d | 40d | 30OCT12 | 24DEC12 |
| 4.0 | Facility Turnover to USBR | 3d | 3d | 26DEC12 | 28DEC12 |
| Act ID | Description | Orig Dur | Rem Dur | Early Start | Early Finish |

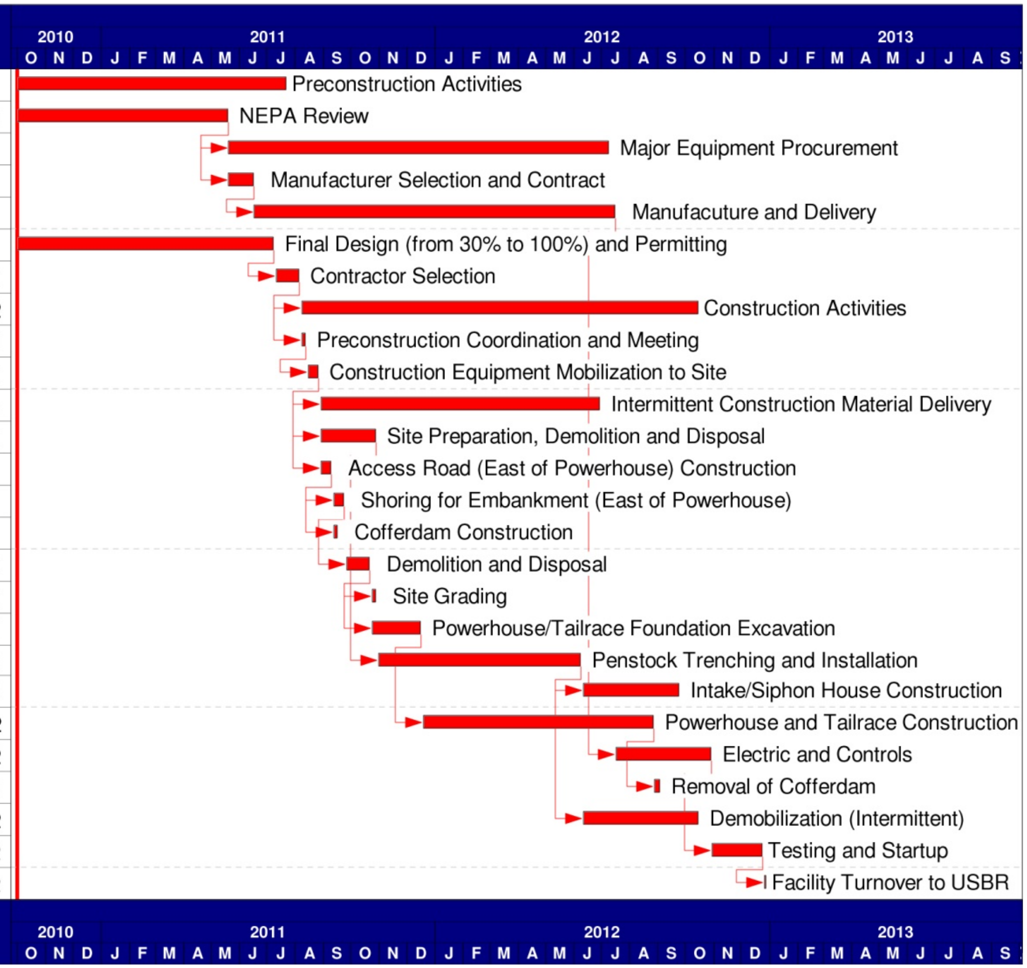



**Illustration 3. Project Schedule**

Manufacturers would be selected for major equipment (e.g., turbines, generators, crane, transformers) and the project design would be complete in early July 2011. The construction contractor would be selected in early August 2011.

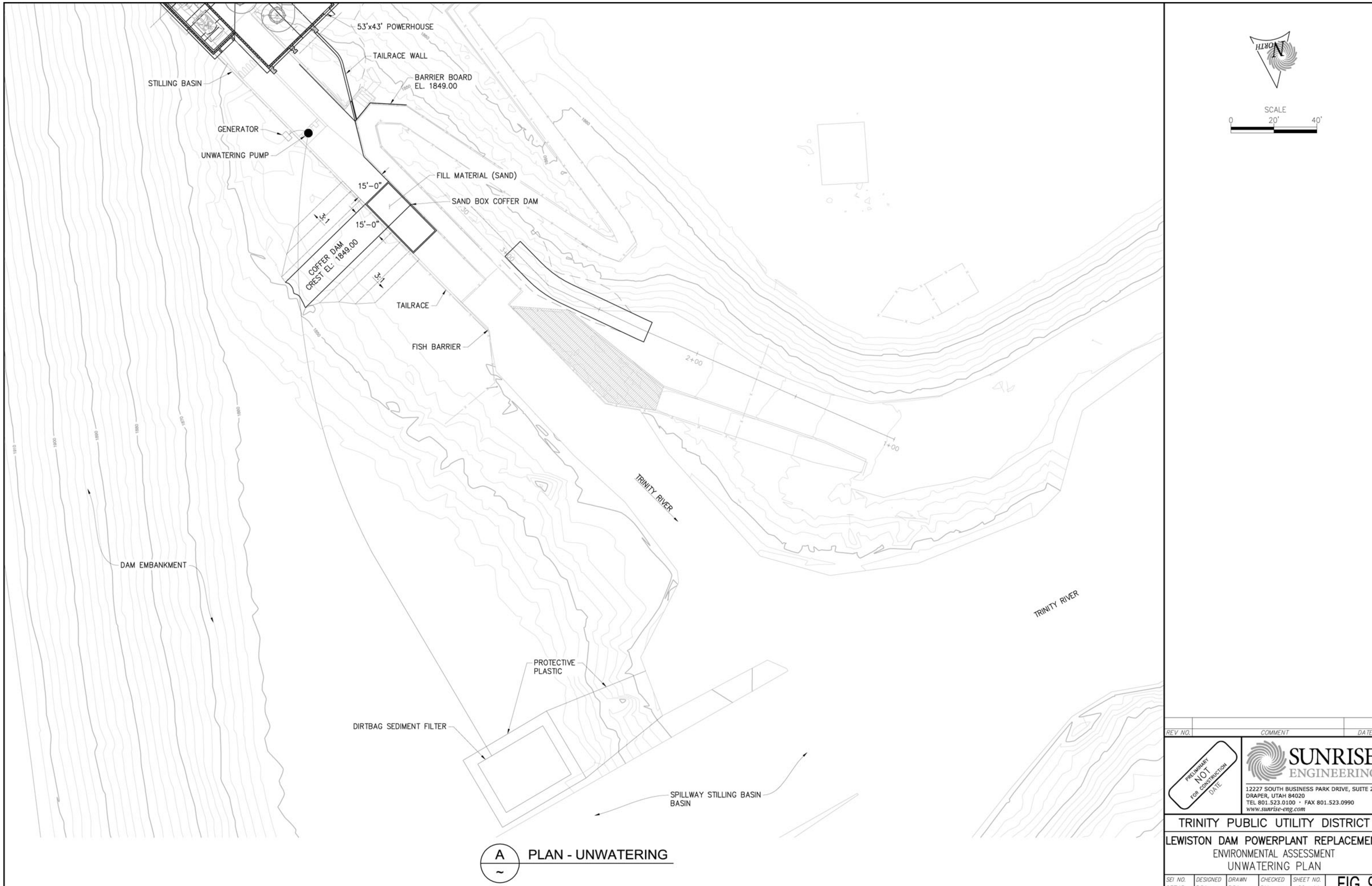
2. **Construction Activities**: Construction activities would include the following:

- preconstruction coordination/meeting
- mobilization
- site preparation, demolition/debris disposal
- excavation of powerhouse/tailrace foundation
- penstock trenching and installation
- intake structure installation
- powerhouse and tailrace construction
- electric and control
- demobilization (intermittent)

A preconstruction meeting with representatives from the USBR, the TPUD and the contractor would be held to ensure compliance with all construction standards. This meeting is expected to occur in early to middle August 2011.

Following the preconstruction meeting, mobilization would start. The contractor would first transport construction equipment to the site within weeks and then continue to transport construction materials to the site on an "as-needed" basis using the existing site access roads through most part of the construction phase. Construction materials would be stored in the staging areas with care not to cause any storm water pollution issues.

Site preparation and demolition activities would follow construction equipment mobilization. An access road to the east side of the powerhouse and tailrace areas would be constructed first. Then shoring of the dam embankment on the east side of the powerhouse as well as shoring of the east stilling basin wall would take place prior to demolition. A cofferdam would be constructed upstream of the fish ladder in mid-September 2011 prior to demolition of the existing powerhouse. The cofferdam would consist of a 1-foot freeboard bolted to the fish ladder walls to stop high water from skirting around the cofferdam, a sand box in the tailrace and an adjacent barrier on the dam slope (see **Figure 9**). The cofferdam crest elevation would be 1,849.00 feet, 1.60 feet above the tail water elevation of 1,847.40 feet at the maximum regulated reservoir discharge of 11,000 cfs. Construction of the cofferdam would require importing fill material of approximately 400 cubic yards and approximately 1,000 square feet of plywood. The cofferdam would be removed when all work in the tailrace area and powerhouse area has been constructed by mid-September 2012. Demolition work is expected to occur between late September and late October 2011. Asbestos screening of the buildings to be demolished would be performed prior to commencing demolition work. Should any asbestos-containing-materials (ACMs) be identified, they would be removed for disposal by certified personnel. Nonhazardous demolition debris would be stockpiled in designated staging areas near the existing powerhouse and would then be trucked to the nearest landfill for disposal during or upon completion of demolition work. After demolition work is complete, the site would be graded as designed and unsuitable soils would be removed from the construction



53'x43' POWERHOUSE
TAILRACE WALL
BARRIER BOARD
EL. 1849.00
STILLING BASIN
GENERATOR
UNWATERING PUMP
FILL MATERIAL (SAND)
15'-0"
SAND BOX COFFER DAM
15'-0"
COFFER DAM
CREST EL: 1849.00
TAILRACE
FISH BARRIER
TRINITY RIVER
DAM EMBANKMENT
TRINITY RIVER
PROTECTIVE
PLASTIC
DIRTBAG SEDIMENT FILTER
SPILLWAY STILLING BASIN
BASIN
A
PLAN - UNWATERING
NORTH
SCALE
0 20' 40'
REV NO. COMMENT DATE
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UNWATERING PLAN
SEI NO. 03745 DESIGNED DSA DRAWN DSA CHECKED DY SHEET NO. 09 of 14


FIG. 9

areas. Construction debris and unwanted soils would first be stockpiled in a project staging area as shown in **Figure 7**. No blasting would be required for site preparation and demolition. BMPs (Section 2.2.6) would be used to minimize soil erosion and sediment impacts.

After the existing powerhouse is demolished, excavation of the powerhouse and tailrace foundation would start. Controlled blasting and/or a hammer drill may be used for excavation of bedrock. BMPs (Section 2.2.6) would also be used to minimize impacts associated with soil erosion, sediment and noise.

Once the foundation excavation is complete, construction of the powerhouse and tailrace would begin. Unwatering would be required from the construction pit during construction of the powerhouse and tailrace. Water resulting from unwatering would be filtered through permeable water bladders (dirtbags) before discharge to the Trinity River.

Meanwhile, construction of other project components would proceed, starting with penstock trenching and installation, intake structure placement and construction of the siphon house. Controlled blasting and/or a hammer drill may be used for penstock trenching through bedrock. Placement of the intake structure would follow the procedures as described earlier in this section. BMPs (Section 2.2.6) would also be used to minimize soil erosion and sediment impacts. Electrical and controls would be the last major task that would be completed within the new powerhouse and substation. During the construction phase, the operation of the Lewiston Reservoir would not be modified. Water release from the Lewiston Dam to the Trinity River would continue through the existing penstock and/or spillway as usual.

Once construction work is done, construction equipment would be demobilized from the site. Some equipment may be demobilized earlier when not needed. Construction debris would be trucked to a landfill nearest to the site.

3. **Testing and Commissioning**: The new powerplant would be tested for commissioning for up to two months. During this period, the equipment would be tested and calibrated in the powerhouse for best operation conditions.
4. **Facility Turnover to USBR**: Once the proposed project is tested and is ready for normal operation, it would be turned over to the USBR as prescribed in the LPPA.

### *2.2.3 Temporary and Permanent Disturbance*

The total acreage of required disturbance is summarized in **Table 2-1**.

**Table 2-1. Summary of Project Disturbance**

| Project Component | Temporary Disturbance (Acre) | Permanent Disturbance (Acre) | Comments |
|---|---|---|---|
| Access Road | 0.05 | 0.00 | Temporary road would be reclaimed |
| Powerhouse | 0.12 | 0.03 | Existing powerhouse ground would be part of new one. |
| Tailrace | 0.15 | 0.00 | |
| Intake Structure | 0.01 | 0.01 | |
| Penstock | 0.28 | 0.00 | Penstock would be buried or overpassing other structure |
| Substation | 0.03 | 0.03 | |
| Siphon House | 0.01 | 0.01 | |
| **Total** | **0.65** | **0.08** | |

### *2.2.4 Operation*

After it is constructed and tested, the proposed powerplant would be turned over to the USBR for operation. The powerplant would use the controlled water release from the reservoir as much as possible through the new intake structure for power generation and then discharge the water back to the Trinity River downstream through the tailrace. If the released water is more than the capacity of the penstock plus the hatchery flows, the excess water would be discharged through the spillway to the Trinity River downstream. **Table 2-2** summarizes elevations of principal features during operation of the project.

The generated power would first meet the hatchery needs. Energy in excess of hatchery loads would be sold by wheeling the excess power through the existing 12-kV transmission line that has been used for the existing 350-kW plant connection to the grid.

**Table 2-2. Elevations of Principal Project Features**

| Principal Feature | Elevation (feet above Mean Sea Level) |
|---|---|
| Dam Crest | 1,912.90 |
| Spillway Crest | 1,877.40 |
| Maximum Observed Reservoir Operational Water Level | 1,904.90 |
| Minimum Observed Reservoir Operational Water Level | 1,903.07 |
| Intake Structure | Invert: 1871.33; Top: 1,883.25 |
| Tail Water Level @ 300 cfs | 1,839.30 |
| Tail Water Level @11,000 cfs | 1,847.40 |

### *2.2.5 Maintenance*

The new facility would require occasional facility shutdown for routine maintenance. Maintenance activities that could occur during the life of the powerplant may involve the replacement of worn parts of various equipment, even a major replacement of all or part of the turbines and generators. Access for routine and unexpected shutdown would be limited to existing roads and disturbed areas.

### 2.2.6 *Proponent Committed Environmental Protection Measures*

The Proponent (TPUD) is committed to implementation of the following environmental protection measures, including a number of BMPs that are intended to reduce short- and long-term impacts, as required components of the proposed action:

A. The proposed project would be constructed in strict compliance with the Plans and Specifications approved by the USBR.
B. An "Operations Plan" would be prepared as required by the LPPA. The plan would contain procedures for meeting emergencies.
C. Waste materials including trash, garbage, petroleum products, etc. would be collected and sent for prompt disposal at an appropriate waste disposal site. Accidental fuel/oil spills would be cleaned up immediately, removed from the project area for disposal at an appropriate site. Diesel and/gas fuels and other necessary chemicals for construction use would be stored in a bermed area so that any accidental spill can be contained.
D. Conventional erosion control procedures would be used as necessary to minimize erosion and siltation during construction and during the period to reestablish permanent vegetative cover on disturbed areas. These include use of silt fence, planting native grasses, trees or shrubs beneficial to wildlife or placement of riprap, erosion mats, bale dikes, mulch or excelsior blankets.
E. All project components would be designed and constructed in accordance with pertinent seismic codes and standards (e.g., the 2006 International Building Code).
F. Water from unwatering activities would be filtered using permeable water bladders (dirtbags) before discharge to the Trinity River.
G. Fugitive dust and vehicle emissions would be controlled according to the California Environmental Protection Agency requirements for construction projects.
H. Local ordinances would be followed as they relate to public safety and could include a notice of closure of use in the area during construction phases, barricades for open trenches, signing, etc.
I. Implementation of the proposed project would comply with all applicable federal and state laws, and local zoning and building ordinances during all phases of project construction.
J. Excavation activities for construction of the project, including the manner of supporting excavation and provision for access to excavations, would be in strict compliance with the current provisions for access to the excavations, as determined by regulations of the California Occupational Safety and Health Administration (Cal-OSHA).
K. If controlled blasting is necessary for rock excavation, all relevant Cal-OSHA requirements would be strictly followed. Moreover, the Proponent has committed to implementation of the following protection measures to minimize potential noise impacts from blasting:

    1. Use of blasting/vibration experts (minimum requirement: blasters with valid California licenses)
    2. Neighboring notification program
    3. Noise monitoring
    4. Initial small explosive charges to refine blasting procedures to ensure that the accumulated noise level would be below 100 decibel (dB) at a distance of 100 meters away from the blasting location
    5. Use of timed multiple charges and blast mats
    6. Use of a bubble curtain if necessary

7. Erection of a 10-foot high sound wall between the construction site and the fish hatchery if necessary
8. No blasting during the most sensitive period (January and February) and ending blasting 30 minutes before sunset during the winter months (November through March) to minimize potential impacts on bald eagles

L. Construction materials would be stored in designated staging areas with care to not cause storm water pollution and sediment issues.
M. Construction workers and inspectors would be required to wear hearing protection devices in accordance with Cal-OSHA regulations when necessary during the construction phase.
N. Every effort would be made to minimize impacts on the natural landscape, native plants and animal species. All unnecessary destruction or scarring of the natural surroundings in the vicinity of the work would be prevented. Movement of crews and equipment would be limited within the areas defined in the Plans and Specifications approved by the USBR.
O. The contractor shall be required to submit a Stormwater Pollution Prevention Plan (SWPPP) and a Spill Prevention, Containment and Countermeasure Plan (SPCCP) for the NCRWQCB review and approval prior to commencing on-site project construction activities.
P. The TPUD would obtain water quality certification or waiver from the NCRWQCB pursuant to Section 401 of the Clean Water Act and a Section 404 permit from the USACE for the proposed project before construction commences. Project design and stipulations contained in the water quality certification or waiver and the Section 404 permit would be strictly followed.
Q. If paleontological resources are discovered during the construction phase, all work in the vicinity of the discovery will immediately cease and USBR's Authorized Officer notified. Work will not resume in that portion of the project area until the discovery has been professionally evaluated and a "Notice to Proceed" issued by the USBR.
R. Should previously undetected archeological sites or human remains be discovered on USBR-administered public lands during project activities, all work in the vicinity of the discovery would immediately cease and USBR's Authorized Officer notified. Work would not resume in that portion of the project area until the discovery has been professionally evaluated, consultations with American Indian Tribes and the California State Historic Preservation Officer conducted, appropriate site treatments completed, and a "Notice to Proceed" issued by the URBR.
S. If possible, rock excavation would be performed using a rock vibration hammer or ripping equipment instead of blasting.
T. The U.S. Forest Service (USFS) and the U.S. Fish and Wildlife Service (USFWS) would be consulted for updated information on known goshawk and spotted owl nests in the project area prior to the onset of project construction.
U. The underwater work at the reservoir would be conducted during the summer months (June through August) before hatchery egg-taking operations begin and before the rainy season starts.
V. Dredged sediments from the reservoir during intake construction would be dumped to a truck for immediate disposal at the nearest landfill or properly stockpiled at the staging area to avoid soil erosion from wind and stormwater until disposal.
W. The California Department of Fish and Game (CDFG) and the USFWS would be consulted prior to commencing project construction regarding to ospreys, a California Species of Concern.

## 2.3 No-Action Alternative

The *Code of Federal Regulations* (CFR), at 40 CFR 1502.14, directs agencies to consider a "no action" alternative in environmental impact statements, but does not provide similar direction for EA level analysis. Analysis of a no action alternative establishes "*a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternative*" (40 CFR 1502.14). Therefore, the EA level analysis includes a study of a no action alternative to serve as a baseline for evaluating effects related to the proposed action.

Under the no action alternative, the existing facilities would continue operations under existing conditions. More available water resources would not be utilized for power generation. The existing powerplant would continue to be used to generate power.

## 2.4 Alternatives Subjected to Screening and Eliminated from Further Analysis

The technical team from Sunrise and the USBR screened six action alternatives and eliminated all from further consideration in their original form due to cost concerns and doubts regarding their effectiveness. The alternatives considered and eliminated were:

### *2.4.1 1-MW Plant with Existing Penstock*

Under this alternative, the existing penstock would continue to be used. The existing plant would be demolished and a new plant would be constructed at the same location housing a new turbine-generation unit with a capacity of 1 MW.

Under this alternative, the hydraulic loss would be 21.1 feet at full capacity. The optimal rated flow would be 289 cfs and the rated hydraulic head would be 43.7 feet. The annual power generation would be approximately 7,870,000 kWh under the normal flow regime.

This alternative was eliminated from further consideration because more available water resources can be economically utilized for power generation.

### *2.4.2 Upper Penstock Modification*

This alternative is similar to the 1-MW Plant alternative with the exception that the 179-foot long upper section of 4-foot diameter concrete penstock would be modified through coating or lining in an effort to lower the hydraulic loss through friction reduction. This alternative was eliminated from further consideration because it would not generate more power than the 1-MW Plant alternative but additional cost would result from coating or lining of the concrete section of the penstock.

### *2.4.3 Lower Penstock Modification*

This alternative is also similar to the 1-MW Plant alternative with the exception that the 143-foot long lower section of 4-foot diameter steel penstock would be replaced with a 7-foot diameter steel penstock in an effort to lower the hydraulic loss as a result of lower flow velocity in the new penstock section. The control valve would also be changed to accommodate the new penstock. Under this option, a small increase in power generation could be realized over the 1-MW plant with the existing penstock option.

This alternative was eliminated from further consideration because the existing steel penstock is not allowed to be altered unless the current operational plan of the Lewiston Dam is changed by the USBR, which may never happen.

### *2.4.4 Entire Penstock Modification*

This alternative is a combination of the Upper Penstock Modification and Lower Penstock Modification as described above. However, this option would not generate more electricity than the Lower Penstock Modification alternative and additional cost would be required. Therefore, this alternative was eliminated from further consideration.

### *2.4.5 2-MW Tunnel Penstock Alternatives*

Two 2-MW tunnel penstock alternatives were considered: Shoreline Tap and Lake Tap. These two penstock alternatives would have the same project components as the proposed action with the exception of the penstock and intake structure.

**Shoreline Tap Tunnel Penstock Alternative**: This 2-MW alternative would incorporate a tunneled penstock underneath the dam's left abutment to a suitable location on the southwest shoreline of the Lewiston Reservoir. The intake would be excavated into the shoreline to allow natural rock formation to serve as a cofferdam to the structure and tunnel terminus. The tunnel would be drilled and blasted into solid bedrock beneath the dam materials and existing utilities on the dam toe and would exit the hillside near the existing powerhouse. This alternative would provide an intake channel and structure located along the south shoreline of the reservoir, just east of the left abutment of the dam. The intake would be constructed in a prepared flat area just east of the dam access road at the left abutment so all construction work may be performed in the dry, thus avoiding the need for a cofferdam. Following the completion of the intake structure, an intake channel would be excavated to the reservoir. The depth of the intake channel would be the same as the intake structure. In order to permit the inspection and maintenance of the penstock, a bulkhead slot would be installed at the inlet to the penstock. The intake structure may be inspected by divers. Intake trash racks with automated rakes would be employed for exclusion of debris from the penstock. The penstock would be a combination of a tunnel and pipeline. The tunnel would be constructed from the intake structure through the bedrock materials in the left abutment to a tunnel portal at the toe of the dam. The alignment of the tunnel may slope at a constant grade to the portal just upstream of the powerhouse so that a vertical shaft and 90-degree elbow could be avoided. The pipeline would be constructed from the tunnel portal to the powerhouse. The pipeline material may be steel, precast reinforced concrete, or cast in place concrete.

**Lake Tap Tunnel Penstock Alternative**: This 2-MW alternative is a modified Shoreline Tap Tunnel Penstock Alternative. The intake structure would be located at the bottom of the reservoir adjacent to the existing intake structure. The intake structure may be constructed in the dry and placed at the tunnel entrance utilizing a crane and divers. Drawing water from the bottom of the reservoir would allow cooler water to be discharged downstream. The penstock would be a tunnel that would convey water from the intake structure to the powerhouse on the downstream end of the dam.

The two 2-MW tunnel penstock alternatives were eliminated from further consideration primarily because:

1. There is risk to the safety of the dam by loosening the rock mass and piping the embankment into the rock fractures potentially leading to dam failure.
2. There is risk to the safety of the dam from excess water pressure in the loosened rock mass at the foundation contact causing internal erosion potentially leading to dam failure.

### *2.4.6 2-MW Trench Penstock*

The trench penstock alternative would have the same project components as the proposed action with the exception of the penstock and intake structure.

The main components of this 2-MW alternative would consist of a concrete intake structure, a 700-foot-long 96-inch-diameter steel penstock installed within an excavated trench, and a new powerhouse. The intake structure would be located at the site of the existing boat ramp, approximately 350 feet southeast of the dam's left abutment. The alignment of the steel penstock would follow the existing access road upstream of the dam to the intersection of the dam access; then it would turn northwest heading towards the site of the existing powerhouse. The existing powerhouse would be replaced with a new larger powerhouse.

This alternative was eliminated from further consideration primarily because:

1. If fish hatchery structures are damaged during trenching operations, it may result in having to complete costly repairs or require reconstructing the fish hatchery. This would result in increased project costs and delay the schedule. In addition, this would impact the fishery below the dam and may result in substantial fines and penalties.
2. There is risk to the safety of the dam by loosening the rock formation and piping the embankment into the rock fractures potentially leading to dam failure.
3. There is risk to the safety of the dam from excess water pressure in the loosened rock mass at the foundation contact causing internal erosion potentially leading to dam failure.
4. Potential exists for reservoir water to flow along the trench to downstream of the dam. If this were to occur, it may pose a threat to the safety of the dam or undermine the foundation of the fish hatchery intake works.

# CHAPTER 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

## 3.1 Introduction

This chapter describes the environment potentially affected by the proposed action and no action alternative and the predicted impacts of the alternatives. These impacts are discussed under the following resource issues: geology, soil and geologic hazards, hydrology, water quality, upland and riparian vegetation, fisheries and wildlife, threatened and endangered species, noise, air quality, land use and recreation, and cultural resources. The present condition or characteristics of each resource is discussed first, followed by a discussion of the predicted impacts under the proposed action and no action alternative. This chapter also discusses cumulative effects, growth-inducing impacts and the environmental justice.

## 3.2 Affected Environment

### *3.2.1 Geology, Soil and Geologic Hazards*

The Trinity River basin occupies portions of two parallel but distinct geologic provinces: the Coast Range Province and the inland Klamath Mountains Province.

The Lewiston Dam site is in the Trinity Mountains, a part of the Klamath Mountains. These mountains are a series of old, complexly folded and faulted metasedimentary and metaigneous rocks intruded by granitic stocks and batholiths.

Before construction of the TRD, the USBR (1959) completed a preconstruction investigation at the Lewiston Dam site. Bedrock at the project site is the Copley greenstone of Devonian age which has been intruded by a hornblende diorite dike or sill. Its total thickness may be in the order of 6,000 feet. Except for minor weak sheared zones, the Copley greenstone is hard and brittle with some exceedingly hard, tough zones.

Drilling at the left abutment area during the dam preconstruction investigation indicates that depths to fresh rock ranged from 0 to 59 feet. The material above bedrock was predominantly silty gravel with local variations into sandy clay and well-graded gravel soil groups. The uppermost part of the soil is more clayey. In 2010, the USBR implemented a drilling program at the site for the proposed project. Boreholes were drilled at the proposed powerhouse and along the proposed penstock line. The drilling results indicate that the fresh greenstone bedrock is around 10 feet below grade in the proposed construction areas.

Trinity County is not unduly seismic. According to the USBR (2004), the vicinity of the Lewiston Dam is located in a region of low historical seismicity and few known Quaternary faults. The region may be subject to low to moderate levels of ground shaking from nearby or distant earthquakes. No local Quaternary faults have been identified, although little detailed mapping of Quaternary geologic features has been conducted in the area. Historic earthquake activity in the area has been very low. No areas of Trinity County are described or mapped as Fault-Rupture Hazard Zones under the Alquist-Priolo Earthquake Fault Zoning Act.

### *3.2.2 Hydrology*

When the U.S. Congress authorized construction of the TRD of the CVP in 1955, the expectation was the surplus water could be exported to the Central Valley without harm to the fish and wildlife resources of the Trinity River. The TRD began operations in 1963, diverting up to 90% of the Trinity River's average annual yield at Lewiston, California in the first several years. Access to 109 river miles of fish habitat and replenishment of coarse sediment from upstream river segments was permanently eliminated by the Lewiston and Trinity Dams. The dramatically reduced in-stream flows in the Trinity River resulted in substantial detrimental changes to the river, with associated noticeable declines in salmon and steelhead populations (USFWS and Hoopa Valley Tribe, 1999). In 1984, the U.S. Congress passed the Trinity River Basin Fish and Wildlife Management Act that established the goal to restore the basin's fish and wildlife populations to those that existed prior to construction of the TRD and directed the Secretary of the Interior to implement measures to restore fish and wildlife habitat in the Trinity River. The U.S. Congress passed the Central Valley Project Improvement Act (CVPIA) in 1992 that further addressed the need to restore the Trinity River and its resources. The U.S. Congress directed the completion of the flow study initiated by the Secretary of the Interior (Secretary Andrus) "*in a manner that insures the development of recommendations, based on the best available scientific data, regarding permanent in-stream fishery flow requirements and operating criteria and procedures (OCAP) of the TRD for the restoration and maintenance of the Trinity River fishery*". As a result of collective scientific effort in the flow study, annual water volumes and recommended daily flow for in-stream release to the Trinity River from Lewiston Dam were developed for different water conditions (extremely wet, wet, normal, dry and critically dry), as shown in **Figure 10**.

**Figure 10** indicates that the minimum discharge from the Lewiston Reservoir to the Trinity River, under the ROD (DOI, 2000), is 300 cfs, and the maximum discharge is 11,000 cfs under the extremely wet regime.

Based on historical records, **Table 3-1** summarizes the probability of each water regime occurring (USFWS and Hoopa Valley Tribe, 1999).

**Table 3-1 Water Year Class**

| Water Regime | Exceedance Probability | Occurrence Every 100 Years | Trinity Reservoir Inflow for Designation (Acre-Feet) |
|---|---|---|---|
| Critically dry | p>0.88 | 12 | <650,000 |
| Dry | 0.60<p<0.88 | 28 | 650,000-1,024,999 |
| Normal | 0.40<p<0.60 | 20 | 1,025,000-1,349,999 |
| Wet | 0.12<p<0.40 | 28 | 1,350,000-1,999,999 |
| Extremely wet | p<0.12 | 12 | ≥2,000,000 |

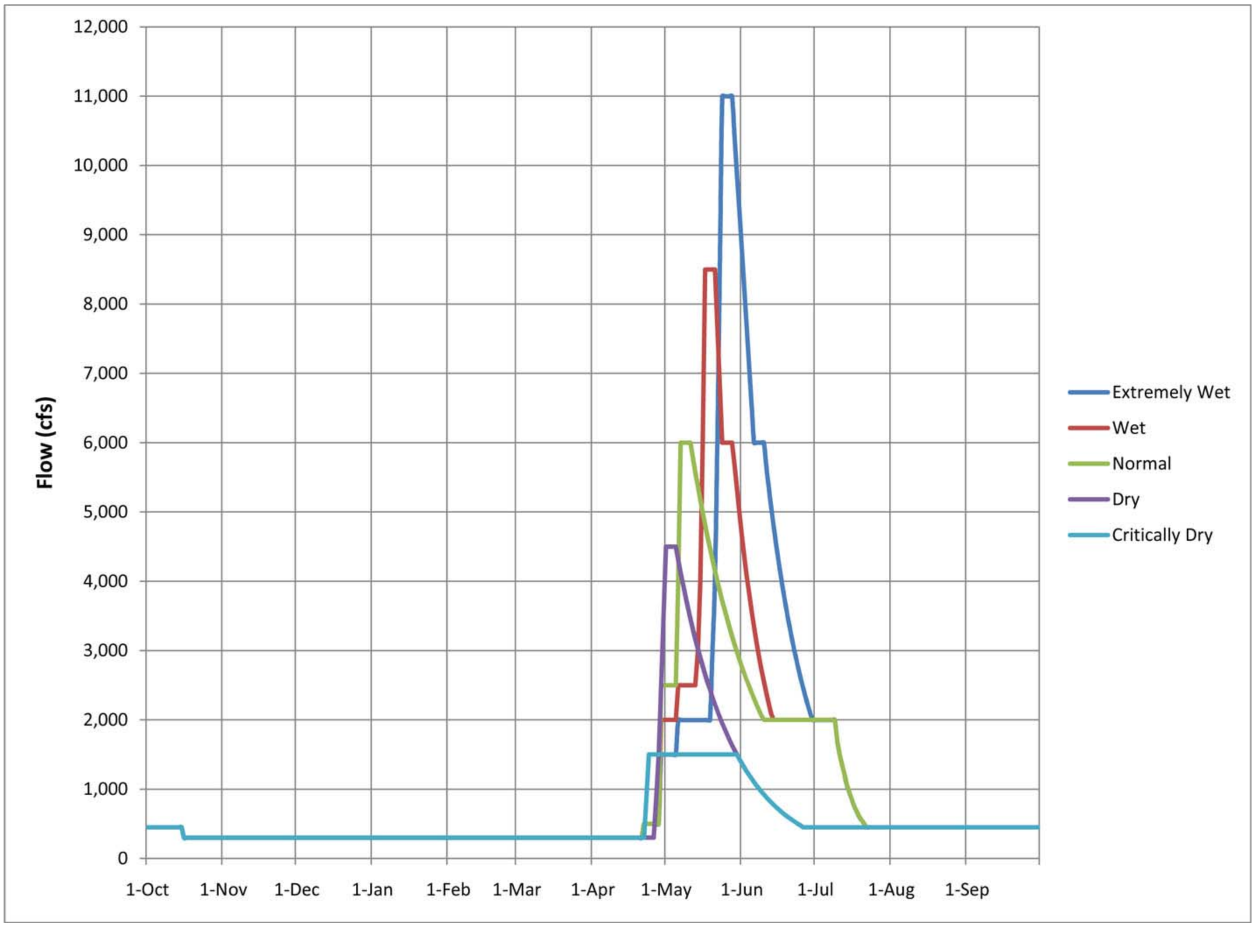


**Figure 10. Lewiston Reservoir Discharge to Trinity River under Water Supply Conditions**

### *3.2.3 Water Quality*

Trinity River water temperatures are influenced by Trinity and Lewiston Reservoir release temperatures, flow rates, channel geometry, regional meteorology, and tributary flows and temperatures. The effect of Trinity and Lewiston Reservoirs diminishes with distance downstream (USFWS and Hoopa Valley Tribe, 1999). Generally, the greater the release volumes from the dams, the less susceptible the river's temperature is to other factors.

According to the USFWS and Hoopa Valley Tribe (1999), water quality objectives regarding Trinity River temperatures, turbidity, and sediment were determined by the California NCRWQCB in conjunction with federal, state and local agencies. Temperature standards are effective from July 1 through December 31 for the upper reach between the Lewiston Dam and the North Fork Trinity River, as presented in **Table 3-2**. The objectives also stipulate that water released into the Trinity River may be no more than 5°F warmer than receiving water temperatures. Turbidity standards state that the turbidity shall not increase more than 20% above naturally occurring background levels. The NCRWQCB criteria for sediment, suspended material and settable material in the Trinity River Basin are to avoid nuisance and maintain beneficial uses in the River. Trinity River water quality is also explicitly protected by Water Right Orders 90-05 and 91-01. These orders state that exports from the TRD to the Central Valley for Sacramento River temperature control shall not harm Trinity River fisheries, as measured by compliance with specific temperature requirements in the

Trinity River.

**Table 3-2 NCRWQB Temperature Objectives for Trinity River**

| Temperature Not to Exceed | Time Period | River Reach |
|---|---|---|
| 60ºF (15.6ºC) | July 1 – September 14 | Lewiston Dam to Douglas Bridge |
| 56ºF (13.3ºC) | September 15 – October 1 | Lewiston Dam to Douglas Bridge |
| 56ºF (13.3ºC) | October 2 – December 31 | Lewiston Dam to confluence with North Fork |

**Figures 11 and 12** show water temperature variations with depth at Lewiston Reservoir in 1999 and 2000.

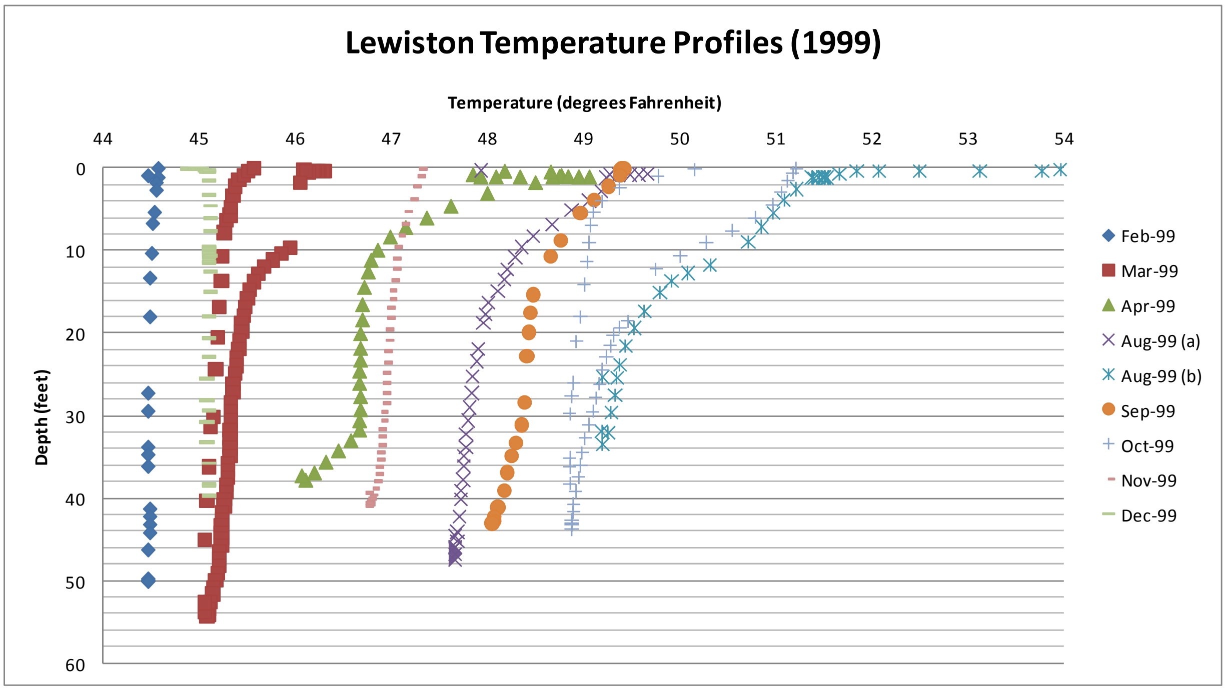


**Figure 11. Lewiston Reservoir Water Temperature Profile (1999)**

The NCRWQCB mandates that dissolved oxygen (DO) levels below Lewiston Dam must not drop below 7 mg/l and 50% of the monthly means must exceed 10 mg/l.

**Figure 13** shows the DO concentrations in the reservoir water measured in 2009 and 2010. **Figure 13** indicates that the DO concentration in the Lewiston Reservoir water is generally greater than 10 mg/l in shallow depths. The November 2009 measurement indicates that the DO concentration was below 10 mg/l at depth greater than 30 feet.

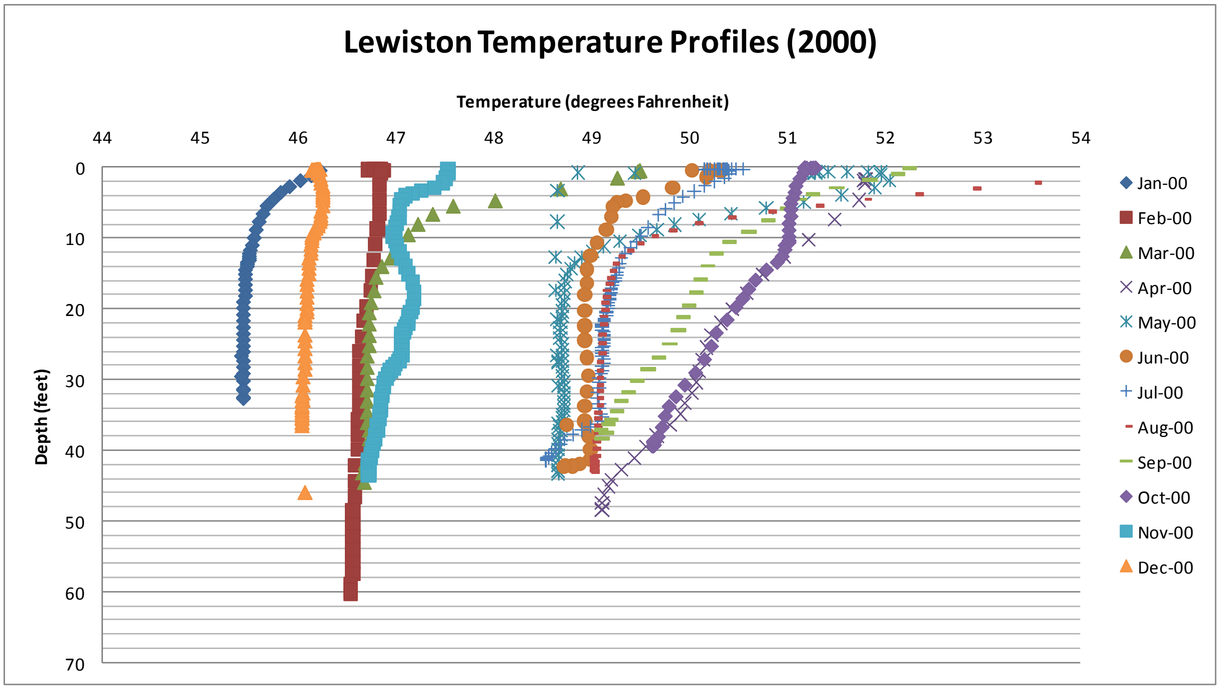


**Figure 12. Lewiston Reservoir Water Temperature Profile (2000)**

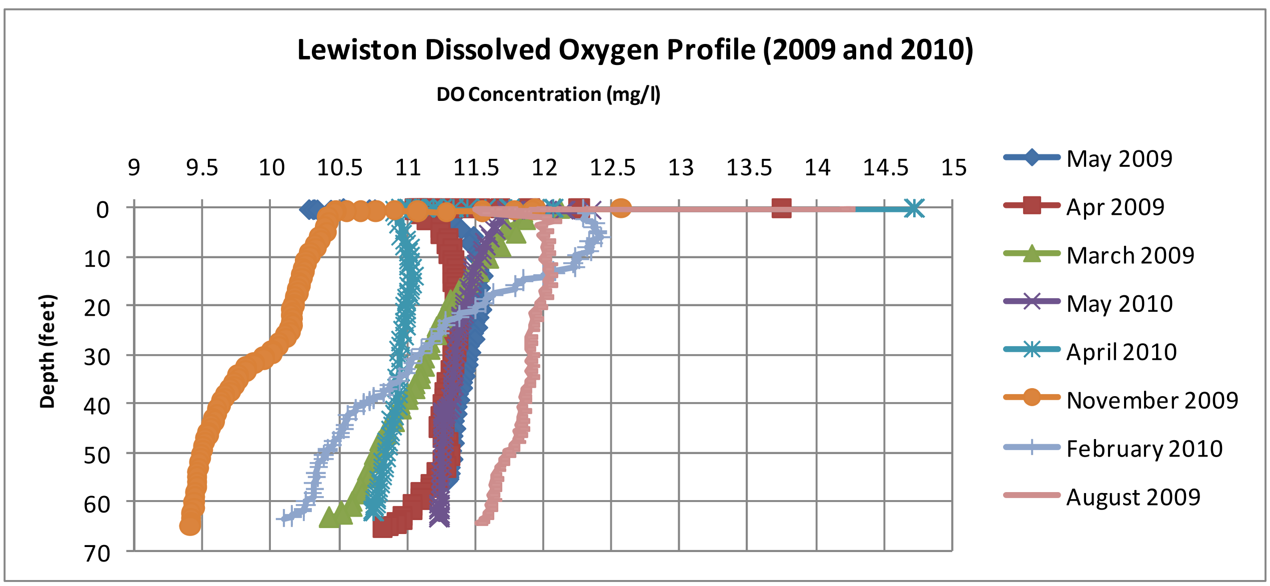


**Figure 13. Lewiston Reservoir Water DO Concentration Profile (2009 and 2010)**

### *3.2.4 Upland and Riparian Vegetation*

There is no upland or riparian vegetation at the proposed work site since the existing tailrace area was either covered with riprap or concrete structures when the tailrace was constructed. The proposed penstock would be constructed in dry areas where no upland or riparian vegetation is present. No riparian vegetation was identified in the proposed intake structure area during a site visit by the biologist on October 18, 2010 (see **Attachment A**).

### *3.2.5 Fisheries and Wildlife*

A Terrestrial and Wildlife Biologic Evaluation report (**Attachment A**) and a Fishery Resources Technical Report (**Attachment B**) provided detailed information about fishery and wildlife resources in the project area. Wildlife and fish species observed during a site visit conducted by Sustain Environmental Inc. biologists on October 18, 2010 are listed in Appendix B of **Attachment A** and are summarized **Table 3-3**.

**Table 3-3 Species Observed during Site Visit on October 18, 2010**

| **Species** | **Special-Status Designation** |
|---|---|
| **FISH** | |
| Rainbow trout, *Oncorhynchus mykiss* | |
| **BIRDS** | |
| Double crested cormorant, *Phalacrocorax auritus* | CDFG Watch List |
| Snowy egret , *Egretta thula* | |
| Great blue heron, *Ardea Herodias* | |
| White-fronted goose, *Anser albifrons* | |
| Mallard, *Anas platyrhynchos* | |
| Common merganser, *Mergus merganser* | |
| Turkey vulture, *Cathartes aura* | |
| Osprey, *Pandion haliaetus* | CDFG Watch List |
| Bald eagle, *Haliaeetus leucocephalus* | Federally Delisted, State Endangered, Fully Protected |
| Lesser yellowlegs, *Tringa flavipes* | |
| California gull, *Larus californicus* | |
| Belted Kingfisher, *Megaceryle alcyon* | |
| Red-shafted flicker, *Colaptes auratus cafer* | |
| Black phoebe, *Sayornis nigricans* | |
| Stellar's jay, *Cyanocitta stelleri* | |
| Common raven, *Corvus corax* | |
| Wrentit, *Chamaea fasciata* | |
| American dipper, *Cinclus mexicanus* | |
| Dark-eyed junco, *Junco hyemalis* | |
| **MAMMALS** | |
| Western Grey Squirrel, *Sciurus griseus* | |
| River otter, *Lontra Canadensis* | |
| Black bear (scat), *Ursus americanus* | |

The fishery resources in the project area and downstream of the Lewiston Dam include native anadromous fishes, resident native and non-native fishes, fishes that inhabit the Lewiston Reservoir and fishes from the hatchery at the toe of the dam.

Detailed fishery resource information in the project area can be found in **Attachment B** prepared by A.A. Rich and Associates, and in Section 3.2.6.

### *3.2.6 Threatened and Endangered Species*

The following is a summary of information contained in **Attachments A and B** about those species that are either federally listed, forest sensitive, or state listed species which could be potentially affected by the proposed project.

### ***3.2.6.1 Terrestrial Wildlife Species***

**Table 3-4** summarizes listed terrestrial wildlife species identified as potentially occurring in the Lewiston 7.5-minute Quadrangle (USFWS, 2010).

**Table 3-4 Listed Terrestrial Wildlife Species Identified as Potentially Occurring in Project Area**

| Species | Status | Critical Habitat Area | Habitat in Area |
|---|---|---|---|
| Bald eagle *Haliaeetus leucocephalus* | FD, SE, SFP | No | Yes, known nesting at Lewiston Reservoir; residents and migrants overwinter. |
| Northern spotted owl *Strix occidentalis caurina* | FT, SE, SFP | Yes | Yes, species documented in project area (T Quinn, USFS). |
| Western yellow-billed cuckoo *Coccyzus americanus* | FC, FSS, SE | No | No, no suitable habitat in project area |
| Fisher, West Coast DPS *Martes pennanti (pacifica)* | FC, FSS, CSC | No | Yes, species documented in project area (T Quinn, USFS). |
| FEDERAL: FE = Federal Endangered; FT = Federal Threatened; FP = Proposed Federal listing; FC = Candidate; FD = Federal Delisted; FSS = USFS Sensitive<br>STATE: SE = State Endangered; SFP = Fully Protected; CSC = Species of Concern | | | |

**Bald Eagle**

Bald eagles are a North American species that historically occurred throughout the contiguous United States and Alaska. After severely declining in the lower 48 States between the 1870s and the 1970s, bald eagles have rebounded and re-established breeding territories in each of the lower 48 states. The largest North American breeding populations are in Alaska and Canada, but there are also significant bald eagle populations in Florida, the Pacific Northwest, the Greater Yellowstone area, the Great Lakes states, and the Chesapeake Bay region (USFWS, 2007).

Bald eagle distribution varies seasonally. Eagles that nest in southern latitudes frequently move northward in late spring and early summer, often summering as far north as Canada. Most eagles that breed at northern latitudes migrate southward during winter, or to coastal areas where waters remain unfrozen. Migrants frequently concentrate in large numbers at sites where food is abundant and they often roost together communally. In some cases, concentration areas are used year-round as migrant birds overlap with resident breeders.

Bald eagles are associated with habitats along the edges of rivers and lakes, though nest locations may occur some distance from open water (Zeiner et al, 1990). Live and dead trees with large lateral limbs are important features for bald eagles. These trees contain branches near their tops that are strong enough to support nests or perching bald eagles (USFWS, 2010). Visual hunters, bald eagles locate prey from perches or while soaring. Primarily fish eaters, they will also eat waterfowl, small mammals, and carrion.

The nesting season for bald eagles extends from January to August 1. Courtship and nesting begin in late winter. Bald eagles usually lay 1 to 3 eggs, which are incubated by both adults for approximately 35 days. Eagle chicks will stay in the nest for about 12 weeks, but will stay at or near the nest for about another 6 weeks after fledging while they are still dependent upon the adults for food.

Bald eagles also use winter roosts as a place to gather and perch overnight. Winter roosts are especially important for bald eagles that have migrated from colder climates, providing a place to find shelter at night and during poor weather. Winter roosts are typically found in areas with larger trees that are sheltered from wind and are within a relatively close distance to foraging areas.

A variety of human activities can potentially interfere with bald eagles, affecting their ability to forage, nest, roost, breed, or raise young During the nest building period, eagles may inadequately construct or repair their nest, or may abandon the nest, both of which can lead to failed nesting attempts. During the incubation and hatching period, human activities may startle adults or cause them to flush from the nest. Startling can damage eggs or injure young when the adults abruptly leave the nest. Prolonged absences of adults from their nests can jeopardize eggs or young. Depending on weather conditions, eggs may overheat or cool and fail to hatch. Young nestlings rely on their parents to provide warmth or shade, and may die from hypothermia or heat stress if adults are forced away from the nest for an extended period of time. Eggs and juveniles are subject to greater predation risk while they are unattended. If human activities disrupt the adults' foraging and feeding schedule, the young may not develop healthy plumage, which can affect their ability to survive. Older nestlings may be startled by loud or intrusive human activities and prematurely jump from the nest before they are able to fly or care for themselves.

Human activities that cause any of these responses and lead to injury, a decrease in productivity, or nest abandonment could be considered disturbance under the Eagle Act, and therefore a violation (USFWS, 2007).

Wintering bald eagles may not be as sensitive to disturbance as breeding pairs, but are still vulnerable. They rely on established roost sites for shelter and because of their proximity to food sources. Human activities near or within communal roost sites may prevent eagles from feeding or taking shelter (USFWS, 2011).

The Shasta and Trinity Units of the Whiskeytown-Shasta-Trinity National Recreation Area support several pairs of resident eagles, 18 pairs at Shasta Lake, 10 pairs at Trinity Lake and 3 pairs at Lewiston Lake (T. Johnson, pers. comm.). There are two documented bald eagle nesting territories within 3 miles of the project site (T. Quinn, and T. Johnson, pers. comm.). Eagles are commonly observed foraging at the Lewiston Reservoir, along the Trinity River and near the hatchery (T. Johnson, pers. comm.; CDFG, 2010a).

**Northern Spotted Owl**

The current range of the northern spotted owl extends from southwest British Columbia through the Cascade Mountains, coastal ranges and intervening forested lands in Washington, Oregon and California, as far south as Marin County (USFWS, 1990). Spotted owls are mostly nocturnal, feeding primarily on northern flying squirrels in the northern western hemlock/Douglas-fir forests and dusky-footed woodrats in the southern, drier, mixed-conifer/mixed-evergreen forests. They will also prey on other small mammals, birds, reptiles and insects.

Spotted owls generally rely on older forested habitats that contain the structures and characteristics required for nesting, roosting, and foraging. Features that support nesting and roosting typically include a moderate to high canopy closure (60 to 90 percent); a multilayered, multi-species canopy with large overstory trees (with diameter at breast height [dbh] of greater than 30 inches); a high incidence of large trees with various deformities (large cavities, broken tops, mistletoe infections, and other evidence of decadence); large snags; large accumulations of fallen trees and other woody debris on the ground; and sufficient open space below the canopy for spotted owls to fly (Thomas et al., 1990).

Like most species of owls, spotted owls do not build nests. They nest in cavities in large trees or on platforms or in nests built by other species. Pair bonding and courtship begin in late winter; females lay one to four eggs in late March or early April and do all the incubation, depending upon the males for food deliveries. After the young leave the nest, in late May or June, they are dependent upon their parents until they are able to fly and hunt on their own. Parental care continues after fledging until the juveniles disperse, from September to December. The average estimated home range size for northern spotted owls in northwest California is 1.3 miles (USFWS, 2008). During the breeding season, the home range is smaller than that used in the remainder of the year (Forsman et al., 1984; Sisco, 1990).

Although relatively long-lived, threats to northern spotted owls include habitat loss (natural and human-caused), disease, inconsistent regulatory protection, and competition with other species (barred owl [*Strix varia*]) (USFWS, 2008).

In 2008, the USFWS issued a revised critical habitat designation for this species. The project site is located in Critical Habitat Block 27 Shasta-Trinity Lakes Unit. There are five documented nesting pairs of spotted owls within 10 miles of the proposed project (T. Quinn, USFS data). The nearest documented nest sites are located 3 and 5 miles northeast of the Lewiston dam near Eastman Gulch and Little Papoose Creek. These locations were reproductively active in 2006 and have not been surveyed since that time (T. Quinn, pers. comm).

**Western Yellow-Billed Cuckoo (Western US Distinct Population Segment [DPS])**

Yellow-billed cuckoo is a candidate for federal listing. The USFWS considers yellow-billed cuckoos that occur in the Western United States to be a DPS. The area for this DPS is generally west of the crest of the Rocky Mountains (USFWS, 1998, 2001). The species is considered endangered in California (CDFG, 2010a).

Western cuckoos require large blocks of riparian habitats (particularly woodlands with cottonwoods (*Populus fremontii*) and willows (*Salix* sp.) for breeding. Dense understory foliage appears to be an important factor in nest-site selection, while cottonwood trees are an important foraging habitat in areas where the species has been studied in California.

Threats to the yellow-billed cuckoo include habitat loss, overgrazing, and pesticide application. Principal causes of riparian habitat losses are conversion to agricultural and other uses, dams and river flow management, stream channelization and stabilization, and livestock grazing. Available breeding habitats for cuckoos have also been substantially reduced in area and quality by groundwater pumping, and the replacement of native riparian habitats by invasive nonnative plants.

Overuse by livestock has been a major factor in the degradation and modification of riparian habitats (USFWS, 2001).

There are no stands of cottonwood riparian habitat in the project area; therefore, there is no suitable habitat for this species. This species is excluded from further discussion.

**Pacific Fisher, West Coast DPS**

The Pacific fisher requires coniferous forests and riparian areas with a high percentage of canopy closure for foraging, and is associated with late-successional and old growth conifer forests (Lofroth et al., 2010). They prefer forests that have complex physical structure near the forest floor. This structure is apparently important for maintaining prey populations and for providing access to prey during the winter. Even in areas where fishers are considered relatively abundant, they are extremely secretive and rarely observed.

Fishers are opportunistic, generalist predators with a diverse diet including mammalian and avian prey, ungulate carrion, vegetation, insects, and fungi (CDFG, 2010b). Fishers are the only forest carnivore beside wolverines that can kill porcupines. Fishers may den in large snags, logs, and cavities, as well as rocky areas in mature, dense forests. They often travel along riparian corridors and will use a variety of other habitat types for foraging.

The fisher breeding season generally lasts from late February to late April. Females give birth to 2-3 kits in late March or April. The kits are entirely dependent upon their mother until they are about 4 months old and capable of killing their own prey. Young fishers are usually on their own by 6 months of age.

Potential threats to fishers include large scale fire and timber harvest operations that do not retain late seral habitat elements. Other potential threats include roads and other features that fragment habitat, predation, poaching, recreation, urban development, and climate change.

Historically, the West Coast population of the fisher extended south from British Columbia into western Washington and Oregon, into the North Coast Ranges, the Klamath-Siskiyou Mountains, and the Sierra Nevada in California. In recent years, biologists using standardized survey methods have been unable to detect the animals over much of their historical range, leading them to conclude that the fisher is extirpated or reduced to scattered individuals from the lower mainland of British Columbia through Washington and northern Oregon, and in the central and northern Sierra Nevada range in California (CDFG, 2010b).

Native populations of fisher currently occur in the North Coast Ranges of California, the Klamath-Siskiyou Mountains of northern California and southern Oregon, and in isolated portions of the southern Sierra Nevada in California. Current estimates of fishers in northern California range from 1,000-4,000 individuals (CDFG, 2010b). While there are no current population estimates for fishers in Trinity County, there have been numerous detections in Shasta-Trinity National Forest (T. Quinn, USFS, pers. comm. and S. Yaeger, USFWS, pers. comm.). Fishers have been documented in the forested habitats surrounding the project area.

### Other Special Status Species

Although not necessarily a requirement, the proposed project would likely require coordination with and permits from the State Water Resources Control Board and CDFG. There are several CDFG-designated special-status terrestrial wildlife species and species of management interest that are known to occur in the vicinity of the project area. **Table 3-5** provides a list of these species, their habitat requirements, and potential for occurrence in the project area.

**Table 3-5 California Sensitive Species**

| Species | State Status | Habitat Requirements | Potential of Occurrence |
|---|---|---|---|
| Foothill yellow-legged frog *Rana boylii* | CSC | Found in rocky streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands from sea level to 6,700 feet. (CalHerps 2010). | Documented in project area |
| Pacific (Western) pond turtle *Actinemys marmorata marmorata* | CSC | Found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, and either rocky or muddy bottoms, in woodland, forest, and grassland (CalHerps 2010). | Documented in project area |
| Northern goshawk *Accipiter gentilis* | FSS<br>CSC | Nests in mature conifer forest, uses a variety of other habitats for foraging. | Suitable habitat adjacent to project area. |
| Pallid bat *Antrozous pallidus* | CSC | Rock crevices, tree hollows (particularly hardwoods), mines, caves and abandoned buildings below 6,000 feet elevation (CDFG 1998, Zeiner et al. 1990). | Suitable habitat in project area. |
| Townsend's Big-eared Bat *Corynorhinus townsendii* | FSS<br>CSC WBWG:H | Primarily cave-dwelling, also associated with abandoned mines and buildings in lower elevation oak woodlands and mixed coniferous forest. | Potential habitat near project site. |
| Silver-haired bat *Lasionycteris noctivagans* | CSC<br>WBWG:M | Coniferous forests, valley foothill woodlands, pinyon-juniper woodlands, and foothill and montane riparian habitats below 9, 000 feet. Potential habitat present. | Potential habitat near project site. |
| Humboldt Marten *Martes americana humboldtdtensis* | FSS<br>CSC | Associated with mature coniferous forests with both overhead cover and complex ground cover. Dens are in hollow trees and on or under logs and rock piles. Primarily nocturnal. | Very rare. Unlikely to occur in the project area but unknown local distribution. |
| Ringtail *Bassariscus astutus* | FP | Widely distributed throughout California, primarily associated with riparian habitats. | Suitable riparian habitat along the Trinity River. |
| Columbia black-tailed deer *Odocoileus hemionus columbianus* | -- | Found throughout most of California, utilize a variety of habitats. | Documented in project area. Lewiston area considered critical winter range. |
| Status: CSC= California Species of Concern; FP= Fully protected; FSS = USFS Sensitive<br>WBWG =Western Bat Working Group: H= High Priority; M= Medium Priority<br>Source: CDFG (2010a) | | | |

### *Foothill Yellow-Legged Frog*

Designated a California Species of Special Concern, foothill yellow-legged frogs are found in rocky streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands from sea level to 6,700 feet (CalHerps, 2010). Foothill yellow-legged frogs are active during spring, summer, and fall along the river margins and in flowing side channels, and probably hibernate in the winter. Eggs are deposited between April and June in shallow, low-velocity areas along rocky, sparsely vegetated river bars (Lind et al., 1996).

Surveys of foothill yellow-legged frogs on the Trinity River found that their distribution is related to the distribution of early successional riparian and gravel-bar habitats (ibid). Greater numbers of frogs were found in reaches farther downstream from the dam, where the gravel bar habitats are in greater abundance. The loss of open, rocky, shallow river bars in the upper river has probably contributed to a decline in foothill yellow-legged frog populations, and the absence of these habitats may deter young frogs from migrating upstream where habitat is less suitable (ibid).

Yellow-legged frog egg and larvae survival depends on timing and volume of runoff events (Lind et al., 1996). From the onset of oviposition, yellow-legged frogs require a minimum of 15 weeks to metamorphose (Jennings and Hayes, 1994), and are extremely vulnerable to fluctuating flows during this period. Unhatched eggs subjected to a high-flow event are generally washed away (Lind et al., 1996). Larvae that hatch prior to a high-flow event are more likely to survive depending on the rate of fluctuation. Rapidly ascending or descending water levels can decrease survival because larvae have difficulty tracking rapidly changing water levels and cannot find appropriate habitat before they are washed away or stranded.

### *Northern Pacific (Western) Pond Turtle*

Along the Trinity River, Pacific pond turtles are found in and along pool and glide habitats of the main channel, and smaller hatchlings and juveniles are found in backwater pools, shallow river margins, and side channels with vegetation (Trinity River Restoration Program [TRRP], 2011). The lower end of side channels (the alcove) is often scoured during large floods, providing deep slow-velocity pool habitat adjacent to the main channel. These pools are important foraging and thermoregulation sites for western pond turtles (Reese and Welsh, 1998). Backwater eddies trap logs and other debris, which are used for aerial basking by western pond turtles when air temperatures are greater than water temperatures (Jennings and Hayes, 1994).

Cooler summer water temperatures may affect western pond turtles by slowing growth, and by altering behavior and habitat selection (TRRP, 2011). Cooler water temperatures may shorten the turtles' active period, increase aerial basking activity, or force turtles to seek warmer waters in shallower or more isolated backwaters. Warmer winter water temperatures would also affect pond turtles, which may overwinter on land or in water, or remain active in water during the winter, depending on temperatures (Jennings and Hayes, 1994).

### *Northern Goshawk*

Northern goshawks are wide-ranging forest raptors found in boreal and temperature forests. In the Pacific Northwest, goshawks are associated with mature coniferous forests, but utilize a variety of plant communities within their home range for foraging, preying on small birds and mammals.

Nests are generally located in the densest stand available (Woodbridge and Hargis, 2006). Goshawks typically return to their nest sites during March and April, lay eggs in mid-April to early May. Incubation lasts about 30 days. Nestlings remain in the nest for 36 to 42 days, typically fledging from late June to late July. Newly fledged goshawks remain close to the nest tree for two to three weeks and gradually expand their explorations until dispersing in mid- to late August.

During courtship and nest building, goshawks are highly susceptible to human disturbance and have been recorded abandoning nest areas following human intrusion. Incubating females may interrupt incubation for extended periods to defend the nest (ibid). The forested habitats near the proposed project may support breeding goshawks.

#### *Special-status Bats*

The project area provides potential roosting and foraging habitat for several species of special-status bats, including pallid bat, Townsend's big-eared bat and silver haired bat. Bats are nocturnal species that roost during the day in sheltered locations. Roost sites are particularly vulnerable to disturbance. Pallid bats are primarily crevice roosting species, and use rock crevices, old buildings, bridges, caves, mines and hollow trees (Bolster, 1998). Townsend's big eared bats are generally cave-dwelling, but roost in structures that resemble caves such as mine shafts, old abandoned buildings, water diversion tunnels, etc. (ibid). Silver haired bats are solitary tree roosting bats that use small tree hollows, or crevices in tree bark, abandoned buildings, rock crevices, wood piles and on cliff faces (Zeiner et al., 1990). No focused surveys for special-status bats have been conducted in the project area so the local distribution and status is unknown.

#### *Humboldt Marten*

The Humboldt marten, a subspecies of the American marten, was considered extinct until 1997, when a small population was discovered on the Six Rivers National Forest (Slauson et al., 2003). Due to its extreme rarity, little is known about the specific habitat ecology of the Humboldt marten (Bolster, 1998). Historical records indicate that that subspecies lived almost exclusively in old growth forest from Del Norte to Sonoma Counties. Due to the early seral stage vegetation and second growth forest surrounding the Lewiston Dam, it is unlikely that this species would be affected by this project.

#### *Ringtail*

Ringtails have been associated with riparian habitat corridors throughout California, from the north coast to the desert southwest (Zeiner et al., 1990). The species is designated as fully protected in California (CDFG, 2010a). Ringtails are highly secretive, nocturnal animals that are rarely observed. They are likely to occur in the project area, especially along the Trinity River corridor and using Lewiston Reservoir.

#### *Columbian Black-tailed Deer*

Columbia black-tailed deer are the most common deer species in California, ranging along the coastal mountains and along the western slope of the Sierra-Cascade Ranges (CDFG, 2002). Because of the existence of long-term data on deer abundance and seasonal ranges, their popularity, and economic value, deer are an important flagship species in the CDFG's environmental review process. They are often the focus of attention in the CDFG's review of proposed projects that are subject to the California Environmental Quality Act (CEQA) and in similar federal environmental review processes conducted by the USFS and U.S. Bureau of Land Management (BLM).

The entire Shasta-Trinity National Recreation Area is classified as intermediate winter range for the Weaverville herd of Columbian black-tailed deer. Critical winter range is located on most of the south-facing slopes, especially on the east side of the reservoirs (USDA, 2005).

#### ***3.2.6.2 Fish Species***

**Attachment B** listed five federal- and sate-listed fish species in the Trinity River System and its tributaries. However, only one of the five species occurs in the project area that is Coho Salmon-So. OR/No. CA Evolutionary Significant Unit (ESU) (*Oncorhynchus kisutch*). Coho salmon are state and federally listed as threatened and that critical habitat has been designated.

**Anadromous Salmonid Species**

The three anadromous salmonid species in the Trinity River system and its tributaries share some life stage characteristics, but differ in terms of timing and habitat requirements. They differ in the time of year that they migrate and spawn, as well as when egg incubation typically occurs. Each species/run also has slightly different microhabitats for each life stage as well as similar microhabitats at different times of the year. This segregation of timing and microhabitats reduces competition between species and runs. Moreover, water temperature requirements are different for the three species and perhaps also for each of the two runs of Chinook salmon.

Chinook Salmon have evolved in a manner that allows them to take advantage of diverse and variable environments. This species has been divided into two basic types of life history strategies: (1) Stream-type and (2) Ocean-type. Stream-type Chinook salmon have adults that swim up streams before they have reached full maturity, in spring or summer, and juveniles that spend a long time (usually more than one year) in freshwater. Ocean-type Chinook salmon have adults that spawn soon after entering freshwater in summer and fall, and juveniles that spend a relatively short time (3-12 months) rearing in the freshwater. As a result of the life history adaptations, the Chinook salmon have many distinct populations, usually recognized as "runs" or "stocks" that show genetically-based adaptations to local and regional environments (Moyle, 2002). Each run is named after the timing of adult spawning of the run. The spring-run and fall-run Chinook salmon inhabit the Trinity River and its tributaries.

Coho salmon historically occurred throughout the Klamath and Trinity River basins. The National Oceanic and Atmospheric Administration (NOAA) Fisheries and the USFS have identified the Trinity River as important coho salmon habitat (NOAA Fisheries, 2002). Coho salmon in the Klamath and Trinity River systems typically have a three-year life history, spending one year in freshwater and another 18 months in the Pacific Ocean. A small percentage of males return to spawn early ("jacks") in their second year.

Steelhead are the anadromous counterpart to the resident rainbow trout. However, similar to other California steelhead, the Trinity River steelhead population has non-anadromous rainbow trout in their population. There are two distinct steelhead spawning types in the Klamath/Trinity River system: (1) winter steelhead and (2) summer steelhead. They are distinguished from one another by:

(1) time of migration, (2) maturity of gonads at migration and (3) location of spawning areas. The temporal and spatial isolation of the two types of steelhead serves to maintain genetic differences (Moyle, 2002).

**Green Sturgeon**

The green sturgeon in the Trinity River is one of two sturgeon species that occur on the west coast of the United States. The other sturgeon species is the white sturgeon. Based on genetic analysis and spawning site fidelity, the NOAA Fisheries has determined that green sturgeon are composed of at least two DPSs: (1) a northern DPS consisting of populations originating from coastal watersheds northward of and including the Eel River (i.e., the Klamath and Rogue Rivers) and (2) a southern DPS consisting of populations originating from coastal watersheds south of the Eel River, with only known spawning population in the Sacramento River. Spawning frequency is not well known, but the best information suggests that adult green sturgeon spawn every 2-5 years (Federal Register, 2006). As the adult migration ends over 40 miles downstream of the Lewiston Dam, it is doubtful that this project would affect North American green sturgeon in the Trinity River.

### *3.2.7 Noise*

Total noise in a given environment is usually measured with an A-weighted decibel scale (dB), which approximates the range of sound audible to the human ear. 10 dB is at the low threshold of hearing and 120 dB is the threshold of pain. **Table 3-6** summarizes typical sound levels of familiar noise sources and public responses. According to the inverse distance law that governs sound propagation, noise generated from a point source generally drops off at a rate of 6 dB with each doubling of distance.

The project site is located in a relatively remote area. Noise levels in the general vicinity of the proposed project site are governed primarily by noise from traffic of local roads and from the operation of the Trinity River Fish Hatchery. Local vehicle traffic, hatchery O&M and miscellaneous sources (e.g., river flow, overhead aircraft) are intermittent source of noise throughout the area. The noise level from the air conditioner for the fish storage trailer (**Photograph 1**) at the fish hatchery was the highest of any onsite noise sources. It is required to keep the storage temperature at 33ºF all the time.

**Table 3-6 Typical Sound Levels of Familiar Noise Sources and Public Responses**

| | dBA | |
|---|---|---|
| | 145 | |
| Physically Painful | 140 | Sonic Boom |
| Extremely Loud | 135 | |
| | 130 | |
| | 125 | |
| Threshold of Physical Discomfort | 120 | Jet Takeoff (Near Runway) |
| | 115 | |
| | 110 | Rock Music Band (Near Stage) |
| | 105 | |
| | 100 | Piledriver at 50 feet |
| | 95 | Freight Train at 50 Feet<br>Ambulance Siren at 100 feet |
| Hearing Damage Criteria for an 8-Hour Workday | 90 | |
| | 85 | Inside Boiler Room |
| Most Residents Highly Annoyed | 80 | Garbage Disposal in Home at 3 Feet |
| | 75 | |
| | 70 | Inside Sports Car at 50 MPH |
| Acceptability Limit for Residential Development | 65 | Average Urban Area |
| | 60 | |
| Goal for Urban Areas | 55 | Inside Department Store |
| | 50 | Typical Daytime Suburban Background |
| | 45 | |
| | 40 | |
| No Community Annoyance | 35 | Typical Library<br>Quiet Rural Area |
| | 30 | |
| | 25 | Inside Recording Studio |
| | 20 | |
| | 15 | |
| | 10 | |
| | 5 | |
| Threshold of Hearing | 0 | |

Source: Adapted from the U.S. Department of the Air Force, 1987, 1989.

Trinity County has no specific noise standards, but a draft noise element of the General Plan developed in 2002 and revised in 2003 is still under review. The county General Plan identifies a specific recommendation that is applicable to the proposed project. This recommendation states "*It must be realized that although noise is not a health problem in Trinity County, it is a major annoyance in some areas and should be abated, when feasible to the benefit of everyone*".

The NOAA Fisheries has set forth fishery sound criteria at 206 dB peak and 187 dB accumulated sound exposure levels for all listed fish species except those less than 2 grams in weight.


**Photograph 1. Cold Trailer Storage with Air Conditioner**

As shown in **Figure 6**, the closest fish hatchery facility where fish are present is the easternmost circular holding pond that is approximately 120 feet and the closest building is the easternmost large building where egg incubation occurs is roughly 300 feet from the proposed construction area where controlled blasting may be used for rock excavation.

The closest population center is Lewiston, located approximately 1 mile south-southwest of the project site. There are employees working at the Trinity River Fish Hatchery. The hatchery office building (just north of the egg incubation building) is about 330 feet from the proposed construction area where controlled blasting may be used for rock excavation.

### *3.2.8 Air Quality*

The project site is located in the North Coast Air Basin (NCAB). The North Coast Air Quality Management Board continuously monitors airborne particulars within Trinity County. The low population density, limited number of industrial and agricultural installations, and minimal problems with traffic congestion all contribute to Trinity County's generally good air quality. Trinity County is currently in attainment with the national Ambient Air Quality Standards (AAQS) for all criteria pollutants. However, it is designated a non-attainment area by the State of California with respect to particulate matter less than 10 microns in aerodynamic diameter (PM10) during winter months. The primary sources of pollutants contributing to the non-attainment designation for PM10 are residential wood burning for heating. Other sources of PM10 in Trinity County include motor vehicle exhaust, forest management/waste burning, and fugitive road dust.

### *3.2.9 Land Use and Recreation*

The Lewiston Reservoir and the surrounding lands are managed by the USFS. The reservoir has approximately 16 miles of shoreline. The reservoir is generally kept near full, as it is used as a regulating reservoir for releases from the Trinity Reservoir, whose releases are controlled by non-power generation water uses. Recreation facilities include campgrounds, a picnic area, boat ramp and marina. Camping, fishing and boating are the primary activities at the reservoir. Low water temperatures generally make this reservoir unsuitable for water-contact activities (e.g., swimming). The Trinity River Fish Hatchery is also open to the public.

The Trinity River, from the Lewiston Dam downstream to Weitchpec, is 110 miles long and spans several management jurisdictions. These jurisdictions in turn influence the management of recreation resources within the Trinity River Basin. The federal government owns and manages about 72% of the land within Trinity County. Between the Lewiston Dam and the confluence of the North Fork of the Trinity River, portions of the river are under the jurisdiction of the BLM. Between the confluence of the North Fork and the confluence with the New River, the Trinity River is managed by the USFS Shasta-Trinity National Forest. Between the New River and the Hoopa Valley Indian Reservation, the Trinity River is managed by the USFS Six Rivers National Forest. The Trinity River Basin also has several wilderness areas managed by the USFS, including the Trinity River Wilderness Area, the Chanchelulla Wilderness Area and the Trinity Alps Wilderness Area. As the river crosses the Hoopa Valley Indian Reservation, it is managed by the Hoopa Valley Tribe. Portions of the river that crosses private land are within the jurisdiction of Trinity or Humboldt Counties.

The entire mainstem of the Trinity River was designated a National Wild and Scenic River in 1981, primarily because of the river's anadromous fishery. In addition, the reach of the river downstream from the Lewiston Dam was classified as having distinctive scenic quality and high peak flow viewer sensitivity. Approximately 97.5 miles of the river are also classified as recreational under the National Wild and Scenic River Act of 1968.

### *3.2.10 Cultural Resources/Indian Trust Asset*

The term "cultural resources" are several different types of properties: prehistoric and historical archaeological sites; architectural properties such as buildings, bridges, and infrastructure; and resources important to Native Americans. Cultural resources known to exist along the Trinity River near Lewiston Dam consist of engineering structures such as Lewiston Dam, weirs, buildings and structures like those at the Trinity River Hatchery, and bridges crossing the Trinity River. Archaeological remains could also be present along the river, in undisturbed soils outside of previous construction corridors.

The National Historic Preservation Act (NHPA) stipulates that the Federal agencies must take into consideration possible effects of a proposed action on historic properties. Historic properties are defined as historic or prehistoric sites, structures, buildings, districts or objects that are listed in or eligible for listing in the National Register of Historic Places (NRHP). Potential effects of the described alternatives on historic properties are the primary focus of this analysis.

The affected environment for cultural resources is identified as the area of potential effects (APE), in compliance with the NHPA (36 CFR 800). The APE (**Figure 14**) is the geographic area within which federal actions may directly or indirectly cause alterations in the character or use of historic properties.

LEGEND FOR APE
MAJOR CONSTRUCTION AREAS
COFFER DAM
AREAS TO BE DEMOLISHED
STAGING & DEMOLITION STORAGE AREAS
HAUL ROUTES
PROPOSED ACCESS ROAD
NORTH
SCALE
0
100'
200'
UNWATERING PUMP AND GENERATOR
COFFER DAM
UNWATERING PIPELINE
DIRTBAG SEDIMENT FILTER AND PROTECTIVE PLASTIC
REV NO.
COMMENT
DATE
PRELIMINARY NOT FOR CONSTRUCTION
DATE
SUNRISE ENGINEERING
12227 SOUTH BUSINESS PARK DRIVE, SUITE 220
DRAPER, UTAH 84020
TEL 801.523.0100 · FAX 801.523.0990
www.sunrise-eng.com
TRINITY PUBLIC UTILITY DISTRICT
LEWISTON DAM POWERPLANT REPLACEMENT
ENVIRONMENTAL ASSESSMENT
AREAS OF POTENTIAL EFFECTS (APE)
SEI NO. 03745
DESIGNED DSA
DRAWN DSA
CHECKED DY
SHEET NO. 14 of 14


FIG. 14

A records search of the APE for the archaeological resources was conducted by the North East Information Center on June 1, 2010, at the request of the USBR archaeologist Dawn Ramsey. The records search included a ¼-mile radius record search area and no previously recorded cultural resources were identified in the project area.

On May 19, 2010, a field survey was conducted by the USBR staff for the recent geologic investigation at the site. The Lewiston Dam was identified as the only cultural resource in the project area. For that undertaking, the USBR determined to treat the Lewiston Dam as a historic property eligible for inclusion in the NRHP under Criterion A. The Lewiston Dam was identified as a component of the TRD of the CVP that stores and diverts Trinity River water to the Sacramento Valley through the Clear Creek Tunnel. It was determined that the geotechnical investigation would not impact the qualities that would make the dam eligible – its abilities to store and divert water. The California State Historic Preservation Office (SHPO) concurred with this finding on July 16, 2010.

Pacific Legacy (2010) conducted research at a variety of libraries and repositories, including the USBR Library in Sacramento, Water Resources Center Archives and the Bancroft Library at the University of California in Berkeley, and Trinity County Society in Weaverville. Based on the research, Pacific Legacy prepared a historic context to address pertinent themes of social, economic, and hydraulic history associated with the Lewiston Dam and the TRD.

On October 7 and 8, 2010, and on April 8, 2011, Pacific Legacy staff conducted a field survey in the project area and recorded all cultural resources located within or immediately adjacent to the APE .

Based on the research and field inventory, Pacific Legacy prepared a cultural resources report entitled *Historic Resources Inventory and Evaluation Report Lewiston Dam Powerplant Replacement Project* .Two cultural resources were identified within the APE: the Lewiston Dam and Powerplant System and the Trinity River Hatchery. Constructed between 1961 and 1964, the Lewiston Dam and Powerplant System is part of the TRD of the CVP and is administered by the USBR. The TRD has not been evaluated for the NRHP and is currently not included in the *Draft Central Valley Project: Planning and Construction of the First Four Divisions, 1935-1956 National Register Multiple Property Submission*, which USBR staff is currently in the process of finalizing. The Lewiston Dam and Powerplant System is an integral component of the TRD and appears to retain its integrity; therefore it was determined as eligible for inclusion in the NRHP under Criterion A based on its association with the CVP. The Lewiston Powerplant does not appear to retain its historic integrity and therefore is a non-contributing portion of the Lewiston Dam and Powerplant System.
The Trinity River Hatchery was originally constructed between 1961 and 1963 as mitigation for the loss of fish habitat due to construction of the Trinity and Lewiston Dams. The Trinity River Hatchery was determined to be not eligible for inclusion in the NRHP, either as a contributing element to the TRD or the CVP, or as an individual property.

Reclamation is currently in the process of consulting with the California State Historic Officer (SHPO).

Indian Trust Assets are legal interests in property held in trust by the United States for federally recognized Indian tribes or Indian individuals. Assets can be real property, physical assets, or intangible property rights, such as lands, minerals, hunting and fishing rights, and water rights. The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to such tribes or individuals by treaties, statutes, and executive orders. These rights are sometimes further interpreted through court decisions and regulations. This trust responsibility requires that all federal agencies take all actions reasonably necessary to protect trust assets.

The USBR staff had communications with Indian tribes and did not identify any Indian Trust Assets that would be adversely impacted by the proposed project.

### 3.3 Environmental Effects

Implementation of the proposed action would not result in significant adverse impacts to any of the critical elements of the human environment or other resources described in Section 3.2.

The impacts that could result from implementation of the proposed project are compared to the no action alternative, which serves as a baseline for this comparison. An analysis of the no action alternative considers what would occur to resource conditions if the proposed action was not implemented.

Direct effects of the implementation of the proposed action would include small, localized impacts to vegetation, water quality and wildlife habitat. The majority of these impacts would be temporary and their effects would be minor.

Environmental consequences of the proposed action and the no action alternative are analyzed by resource in the same order as each resource is described and appears in Section 3.2.

Impacts are analyzed as being direct and indirect types of effects on resources, that are either short or long term in duration. These effects, and other less-quantifiable impacts, are described in detail using the following methods.

Impacts are quantified where possible. In the absence of quantifiable data, professional judgment was used to characterize the potential impact. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate.

The intensities of impacts to each resource have been described using the following guidance:

Negligible: The impact is at the lower level of detection; there would be no measurable change.

Minor: The impact is slight but detectable; there would be a small and possibly permanent change.

Moderate: The impact is readily apparent; there would be a measurable change. This change would be obvious and noticeable but not severe.

Major: The impact is severe; there would be a highly noticeable, long-term, or permanent measurable change.

#### *3.3.1 Geology, Soil and Geologic Hazards*

##### <u>3.3.1.1 Proposed Project</u>

Implementation of the proposed project would cause minor alteration of landforms that would be highly localized in the left abutment area where a new intake structure, siphon house and 96-inch diameter penstock, and a new powerhouse would be constructed. The penstock would be buried underground with the exception that a 65-foot aboveground segment would overpass the hatchery water supply inlet works. The new powerhouse would be located at the same location of the existing plant. The intake structure would be submerged in the reservoir water.

The geologic conditions at the site are suitable for the proposed project construction. All project components would be designed and constructed in accordance with pertinent seismic codes and standards (e.g., the 2006 International Building Code), and reviewed and approved by the USBR (Environmental Protection Measures A and E as described in Section 2.2.6). Furthermore, an "Operations Plan" would be prepared as prescribed in the LPPA (Environmental Protection Measure B as described in Section 2.2.6). The plan would contain procedures for responding to emergencies.

Implementation of the proposed project could result in direct new disturbance of approximately 0.65 acre of land. An estimated 5,000 cubic yards of soil and rock would be excavated for project construction. For public safety purposes, excavation activities for construction of the project, including the manner of supporting excavation and provision for access to excavations, would be in strict compliance with the current provisions for access to the excavations, as determined by Cal-OSHA regulations (Environmental Protection Measure J as described in Section 2.2.6).

About 0.08 acre of the 0.65-acre new disturbance would be permanent because re-vegetation or naturalization on the intake structure, tailrace, siphon house and the substation would not be likely. Other soil disturbances would be short-term until reclamation, successful re-vegetation or naturalization occurs. Any project-related soil erosion would also be temporary and short-term until successful re-vegetation or naturalization is completed. The activities associated with restoration/rehabilitation of disturbed areas and soil and siltation control measures, as described in Environmental Protection Measures D and M as described in Section 2.2.6 of the proposed project, would help minimize these short-term and temporary project-related impacts on soils.

#### 3.3.1.2 No Action Alternative

No impacts would occur under the no action alternative.

### *3.3.2 Hydrology*

#### 3.3.2.1 Proposed Project

The proposed action would not alter the volume of the regulated water discharge to the Trinity River from the Lewiston Dam during project construction and operation. Proposed project water "use" would be non-consumptive as water used for power generation from the reservoir would be returned to the river. Therefore, implementation of the proposed project would not have any impact on hydrology.

#### 3.3.2.2 No Action Alternative

No changes would occur under the no action alternative.

### *3.3.3 Water Quality*

**<u>3.3.3.1 Proposed Project</u>**

***<u>Temperature</u>***

**Figures 11 and 12** indicate that the water temperatures at a depth of 20 feet and deeper in Lewiston Reservoir were almost constant during most times of the year and were all below 51°F. The figures also indicate that the temperatures at shallow depths and on the surface, when compared to those at a depth of 20 feet, were about 2°F higher in July, September and October, 4°F higher in August, and almost the same in November and December. Water released from the proposed penstock would not result in increased water temperatures downstream in the Trinity River that would exceed the NCRWQB temperature objectives for the Trinity River. **Figure 10** indicates that water releases through the spillway occurs from late-April through mid-July. Because more water would be released through the new penstock at a depth of approximately 25 feet, less water would be released from the surface through the spillway, temperature control capabilities in the Trinity River may be slightly enhanced.

***<u>Sediment</u>***

Since the proposed project would not alter the water released from the Lewiston Dam into the Trinity River, the project would not have any impact on sediment level or turbidity in the Trinity River in the long run. However, the proposed project could have short-term, negligible impacts on sediment level or turbidity during the construction stage of the proposed project.

Construction of the proposed project would result in removal of approximately 5,000 cubic yards of soil and rock. Based on recent geotechnical drilling and pumping tests conducted by the USBR at the site, the amount of water removed during unwatering in the powerhouse and tailrace construction pit during the construction phase would be minimal. Moreover, that water would be filtered using permeable water bladders, or dirtbags, (for detailed information about permeable water bladders (dirtbags) refer to **Attachment C**) before discharge into the Trinity River (Environmental Protective Measure F in Section 2.2.6). Temporary turbidity increases at the construction site would be expected during construction of project components. Placement of the intake structure in the reservoir in the left abutment area would cause turbidity increase in the reservoir locally for a short period of time. Construction of the tailrace and powerhouse could affect the surface water quality in the Trinity River with increased sedimentation. Such increases would be monitored under the terms of the applicable water quality permit, but are expected to be relatively small absent a large flood event causing erosion of the work site. Nonetheless, even in a flood, the increments in sediment loading per unit volume probably would be relatively small given the high sediment loading typically carried by floods.

The TPUD would obtain water quality certification or waiver from the NCRWQCB pursuant to Section 401 of the Clean Water Act and a Section 404 permit from the USACE for the proposed project before construction commences. Project design and stipulations contained in the water quality certification or waiver and the Section 404 permit would reduce surface disturbance to the maximum extent possible (Environmental Protective Measure P in Section 2.2.6). The implementation of BMPs (e.g., silt fence), as described in Environmental Protective Measures D, I, L, N, O and V) described in Section 2.2.6, would also minimize short-term water quality impacts related to surface disturbing construction activities.

***Dissolved Oxygen***

DO levels in water discharged into the river would be at the concentrations that exist in the reservoir. However, the DO levels may be slightly lower than the present downstream concentrations because some portion of the released water, with implementation of the proposed project, would no longer be re-aerated during the summer when more water would be released through the new penstock and the powerhouse, resulting in less water released through the spillway. Surface spill results in more aeration of water, while water flowing through the penstock and the powerhouse would receive little or no aeration. This may be offset somewhat by the fact that the water probably would be colder and colder water has higher DO levels. **Figure 13** indicates that DO concentrations of the Lewiston Reservoir water measured during 2009-2010 were greater than 10 mg/l at depths less than 30 feet. The penstock would receive water at a depth of approximately 25 feet and therefore, implementation of the proposed project would not likely cause the DO levels downstream of Lewiston Dam to violate the NCRWQCB requirements that DO levels in the Trinity River below Lewiston Dam must not drop below 7 mg/l and 50% of the monthly means must exceed 10 mg/l. Therefore, the proposed project may have a negligible impact on DO levels in the Trinity River below the Lewiston Dam.

#### 3.3.3.2 No Action Alternative

There would be no project-related impact on water quality under the no action alternative.

### *3.3.4 Upland and Riparian Vegetation*

#### 3.3.4.1 Proposed Project

Because there is no upland or riparian vegetation at the proposed work site, the proposed project would have no impact on upland and riparian vegetation.

#### 3.3.4.2 No Action Alternative

There would be no project-related impact on upland and riparian vegetation under the no action alternative.

### *3.3.5 Fisheries and Wildlife*

#### 3.3.5.1 Proposed Project

**Terrestrial Wildlife and Habitat**

Implementation of the proposed project would have negligible to minor short and long term impacts on terrestrial wildlife populations and their habitat. Heavy equipment use, vehicular traffic, trenching, drilling/blasting and other activities related to the construction of the proposed project could minimally impact some wildlife species during the estimated 14 months of construction period. The noise/activity impact on wildlife would be temporary during the construction phase. Direct impacts would be short-term and localized to those portions of the project area that are currently undisturbed. Some small mammals and reptiles may be susceptible to injuries or mortality during the construction phase. Populations of terrestrial wildlife species on the whole are unlikely to be adversely affected. A net of permanent loss of approximately 0.08 acre of sparsely vegetated land would eliminate minimal forage, thermal cover and habitat. The effects on wildlife due to the area of lost habitat would be very small compared to the large areas of undisturbed habitat on adjacent federal lands managed by the Shasta-Trinity National Forest.

The proposed project would unlikely alter feeding, breeding, or other behaviors, even during the construction phase of the proposed project. Moreover, similar habitat is available on lands adjacent to the project area where these species could find refuge.

**Unlisted Native Fish Species**

Implementation of the proposed project would have minor short term impacts on fish populations and their habitat. Minor impacts to the quality of aquatic habitat could occur during the startup of construction activities for the project and construction activity for the intake structure in the reservoir. These would include slight increases in sedimentation during installation of the cofferdam in the tailrace area, and removal of overburden material and installation of the intake structure in the proposed intake structure area. Noise levels at the construction site and adjacent area would also be increased due to construction activities including rock drilling and potentially controlled blasting. During the construction phase, fish species could find refuge downstream of the construction site and other area of the reservoir which has an estimated surface area of 759 acres.

In the long term, the proposed project would not negatively impact aquatic habitat for native fish.

#### 3.3.5.2 No Action Alternative

There would be no project-related impact on fisheries and wildlife under the no action alternative.

### *3.3.6 Threatened and Endangered Species*

#### 3.3.6.1 Proposed Project

**Terrestrial Species**

The proposed project is unlikely to result in any direct or permanent effects upon special-status terrestrial wildlife species or their habitats.

Project construction-related effects would be confined almost entirely to the existing footprint of the Lewiston Powerplant and Trinity River Fish Hatchery facilities. Construction of the new intake structure on the left bank of the reservoir just upstream of the left dam abutment would constitute the only new disturbance resulting from the proposed action.

Disturbances in the proposed action area would include a temporary (approximately 310 days) increase in truck traffic, equipment operation, and worker foot traffic along existing access roads and in already disturbed lots currently in use for O&M of the existing facilities. Removal of ruderal vegetation and, perhaps trees and shrubs, may occur during improvement of these areas to accommodate equipment staging.

Drilling and blasting and/or the use of trackhoes fitted with hydraulic rock hammers for excavation of rock are expected to be the most intrusive operations associated with the proposed action. They would raise noise levels in the project area substantially above current O&M levels. Blasting is the louder of these operations, but it would be episodic, whereas drilling and hammering operations would not be as loud, but more chronic. These high-noise operations would be carried out on the different portions of the project concurrently in order to minimize the duration of this disturbance, and it would occur over a period of approximately 60 days. Noise from project traffic and other construction operations may exceed baseline O&M levels at times during the remainder of the 310-day construction period.

Construction of the new intake structure would first involve dredging or excavation of overburden to expose fresh bedrock, followed by placement (and anchoring) of a pre-cast concrete pad and underwater pumping of AWAs between the bedrock and pre-cast pad. The prefabricated intake structure would be secured to the pad and the replacement penstock connected to the intake structure. Removal of material to expose fresh bedrock would require dredging of approximately 23 cubic yards of surface sediment (25-foot by 25-foot area with 1-foot thick sediment) and approximately 2.3 cubic yards (assuming 10%) of the sediment may disperse into the surrounding water. The loose sediment may transport radially in the basically stagnant reservoir water. A recent hydrographic survey at the proposed intake structure area revealed that the average water depth is approximately 37 feet. The radius of influence is generally 4-5 times the water depth, resulting in an estimated 170-foot radius of influence (using 4.5 times the depth of water). The impacted water volume would be approximately 8,400 cubic yards. As a result, the average increased suspended sediment concentration within the estimated radius of influence would be less than 0.5 g/l with the highest sediment concentration at the disturbing point. Since the water in the reservoir is relatively stagnant, majority of the suspended sediment would eventually settle down to the bottom of the reservoir. The water with increased suspended sediment may be introduced into the hatchery water system, or transported into the river downstream resulting in increased turbidity. Run-off of this material during temporary storage or following permanent disposal on land could also result in impacts to wetland and water resources.

With the implementation of Environmental Protection Measures C, D, F, I, K, L, N, O, P, S, T, U, V and W, as described in Section 2.2.6, the proposed project is unlikely to adversely impact special-status terrestrial wildlife species or their habitats.

**Fish Species**

Noise and water quality impacts associated with construction activities could affect listed fishes. Although there is noise associated with O&M of the existing facilities, the construction process would present a potential issue for the listed fish species at the adjacent hatchery.

Types of noise that would be generated from the construction of the proposed project can be divided into two general categories: (1) loud noise associated with blasting and/or vibrating hammer drilling and (2) moderate-level noise from hauling trucks, excavation and other construction activities that generate less noise.

Blasting and using vibrating hammers result in noise levels that have been demonstrated to be harmful to fishes (Hastings and Popper, 2005). Hauling trucks, use of cranes, bulldozers and excavation generate much less noise (Federal Highway Administration website:

http://www.fhwa.dot.gov). Blasting has resulted in decreased larval growth and mortality of the eggs of rainbow trout and other salmonids and other fish species. Other noise-generating activities have resulted in high mortalities, hearing loss, tissue damage, and exploded swim bladders in a variety of fish species. Sublethal responses of fish to noise include (1) avoidance and (2) release of stress hormones that, in turn, can negatively affect the fish either short-term or, the population long-term (Hastings and Popper, 2005). Based on the proposed project schedule, the following fish life stages could potentially be negatively affected:

- Artificial spawning, egg incubation, and rearing of fall-run Chinook salmon, spring-run Chinook salmon, coho salmon, and steelhead

Of the various life stages, the egg stage is most sensitive to environmental perturbations.

Moderate-level noise associated with hauling trucks, using cranes, bulldozers and other construction-related equipment that would occur throughout the construction phase of the proposed project could affect artificial spawning, egg incubation, fry emergence, and rearing of each of the salmonids at the hatchery.

As described in Section 3.2.7, the closest hatchery facility where fish are present is the easternmost circular pond that is approximately 120 feet from the nearest potential blasting location. The closest building where egg-incubation occurs is 300 feet. The noise level can be controlled within 100 dB using controlled blasting at a distance of 100 meters (or 328 feet) from the blasting location at mining sites (Sastry and Chandar, 2005). According to the inverse distance law that governs the sound propagation, noise generated from a point source generally drops off at a rate of 6 dB with each doubling of distance. If the noise level at 100 meters is controlled at or below 100 dB, the noise level would be within 109 dB at the nearest circular pond and would be within 100 dB at the nearest building where egg incubation occurs. Drilling noise level is not as high as blasting. Rock drill generally generates a noise level of 90 dB at 50 feet. The increased noise level would be well below the NOAA Fisheries' fishery sound criteria at 206 dB peak and 187 dB accumulated sound exposure levels for all listed fish species except those less than 2 grams in weight.

Construction of the proposed intake structure would involve (1) dredging excavation of the overburden to expose fresh bedrock, (2) placement and anchoring of a pre-cast concrete pad and (3) underwater pumping of anti-washout admixtures between the bedrock and precast pad. These activities could have an effect on water quality in the reservoir in the vicinity of the construction activities. The dredging/excavation would temporarily result in increase silt locally in the reservoir that could negatively affect the trout swimming in the vicinity of the construction area. In addition, the water with increased silt content would be introduced into the hatchery water system since the existing hatchery intake structure is approximately 180 feet away from the proposed powerplant intake structure, or transported into the river downstream of the dam. Run-off of the dredged material during temporary storage, or following permanent disposal on land, could also result in impacts to salmonids, if silted turbid water flowed into the Trinity River. Silt and/or suspended sediment could affect salmonids directly by suffocating them as a result of clogged gills. More commonly, the presence of silt and/or suspended sediments could cause chronic sublethal effects such as: (1) increased swimming activity (as in "frenetic" and hence decreased swimming performance) and by reacting in a frightened or alarmed manner, (2) reduced feeding rates, (3) reduced growth rates and (4) sublethal stress responses that negatively affect their physiology and hence their livelihood (Newcombe and MacDonald, 1991; Newcombe, 1993; Rich 2010).

Other construction-related activities, such as excavation, trenching, stockpiling, grading, shoring for embankment, demolition and unwatering could result in silty water that could flow into the Trinity River immediately downstream of the Lewiston Dam and negatively impact the listed salmonids.

While the proposed project would not change the volume of the regulated water discharge to the Trinity River from the Lewiston Dam, the proposed flow through the mouth of the fish ladder/tailrace would be increased. Presently, the entire minimum flow of 300 cfs is at times discharged through the existing penstock and the mouth of the fish ladder/tailrace from October 16 through March 15, resulting in an estimated average flow velocity of 2.4 fps just outside of the fish ladder entrance. With implementation of the proposed project, the minimum flow of 300 cfs through the mouth of the fish ladder/tailrace would remain unchanged from October 16 through March 15; the flow would be increased to 450 cfs from Labor Day through October 15, resulting in an estimated average flow velocity of 2.9 fps just outside of the entrance of the fish ladder; and the flow would be increased to 540 cfs with an average velocity of 3.4 fps through the mouth of the fish ladder/tailrace from the end of April through the end of June or July, depending on the flow regime, during which time the fish ladder is not in operation. Therefore, implementation of the proposed project would increase the flow velocity by 0.5 fps (or 21% increase) at the mouth of the fish ladder when the fish ladder is in operation from Labor Day through October 15.

With the implementation of Environmental Protection Measures C, D, F, I, K, L, N, O, P, S and V, as described in Section 2.2.6, the proposed project is unlikely to adversely impact special-status fish species or their habitats. On July 5, 2011, NOAA Fisheries concurred with Reclamation's determination that the proposed Lewiston Power Plant upgrade is not likely to adversely affect threatened coho salmon or destroy or adversely affect designated critical habitat.

#### 3.3.6.2 No Action Alternative

There would be no project-related impact on threatened and endangered species under the no action alternative.

### *3.3.7 Noise*

#### 3.3.7.1 Proposed Project

Operation of the new powerplant would not increase the current noise level from the operation of the existing powerplant. However, substantial, temporary construction noises may be created at the work site, especially when controlled blasting and/or a hammer drill is used for bedrock excavation for approximately three months intermittently between September-December 2011. Construction workers and inspectors would be required to wear hearing protection devices in accordance with Cal-OSHA regulations when necessary during the construction phase (Environmental Protection Measure M as described in Section 2.2.6). Nonetheless, noise levels at the nearest residences are expected to be low. With the implementation of Environmental Protection Measure K as described in Section 2.2.6, the noise level resulting from project construction would not exceed the NOAA fishery sound criteria at 206 dB peak and 187 dB accumulated sound exposure levels and the noise level at the hatchery office building would be approximately 100 dB. The actual accumulated time for controlled blasting may be less than 1 hour and hammer drilling less than 168 hours. The short-term impact would disappear after the proposed project construction is complete.

#### 3.3.7.2 No Action Alternative

No changes would occur under the no action alternative.

### *3.3.8 Air Quality*

#### 3.3.8.1 Proposed Project

Some increase in traffic and associated air emissions would occur during the construction phase of the proposed project. This short-term impact would disappear after the proposed project construction is complete. Moreover, due to the high quality of the ambient air in the area, the additional traffic would not be enough to cause problems apart from generating some fugitive dust. Furthermore, the proponent is committed to controlling fugitive dust and vehicle emissions according to the California Environmental Protection Agency requirements for construction projects (Environmental Protection Measure G as described in Section 2.2.6).

#### 3.3.8.2 No Action Alternative

No changes would occur under the no action alternative.

### *3.3.9 Land Use and Recreation*

#### 3.3.9.1 Proposed Project

The proposed project would not alter land use or adversely affect recreational uses of the area downstream of the project site since the project would not alter the flow pattern and regime in the Trinity River. During the construction phase of the proposed project, the Trinity River Fish Hatchery would remain open to the public and the operation of the hatchery would not be disrupted. The proposed project would have beneficial effects on the hatchery by providing a standby water supply line from the new penstock. This backup line would be used when the existing water supply line to the hatchery should require inspection and repair.

However, during the construction phase of the proposed project, access to the Lewiston Dam may be impacted by construction activities or construction activities may cause recreational visitors to stay away from the reservoir. Thus, the proposed project may have short-term adverse impacts on recreational activities in the Lewiston Dam area. These impacts would disappear after the proposed project construction is complete.

#### 3.3.9.2 No Action Alternative

No changes would occur under the no action alternative.

### *3.3.10 Cultural Resources/Indian Trust Assets*

#### 3.3.10.1 Proposed Project

Recent historic resources inventory and evaluation at the project site conducted by Pacific Legacy (2011) indicates that the Lewiston Dam and Powerplant System is eligible for inclusion in the NRHP under Criterion A based on its association with the TRD of the CVP. Reclamation has initiated consultation with the SHPO and will complete this consultation as soon as possible. Reclamation is also committed to ensuring that reasonable mitigation measures, if determined to be appropriate, will be implemented and that reasonable mitigation options will not be precluded prior to the conclusion of the SHPO consultation. Finally, such mitigation actions that may be appropriate will not change the proposed Lewiston Powerplant upgrade project to the extent that supplemental NEPA documentation will be needed.

#### 3.3.10.2 No Action Alternative

Under the No Action Alternative, Reclamation would not approve the replacement of the powerplant and therefore there would be no impacts to cultural resources.

## 3.4 Growth-Inducing Impacts

The project would not affect human settlement or markedly increase use of any of the proposed sites, so no growth-inducing impacts are expected.

## 3.5 Environmental Justice

Implementation of the proposed project would not disproportionally (unequally) affect any low-income or minority communities within the project area. The primary reason for this is that the proposed project would not involve major facility construction, population relocation, health hazards, hazardous waste, property takings, or substantial economic impacts. Moreover, the site is rather remote from residential areas on one hand and the project would provide work in a poverty prone area on the other. This action would therefore have no adverse human health or environmental effects on minority and low-income populations as defined by environmental justice policies and directives. Executive Order 12898 established environmental justice as a Federal agency priority to ensure that minority and low-income groups are not disproportionately affected by Federal actions. As 2009, the population of Trinity County was 14,165 consisting of roughly 2,820 individuals living below poverty level and 1,512 individuals belonging to various minority groups.

## 3.5 Cumulative Impacts

In addition to project-specific impacts, the USBR analyzed the potential for significant cumulative impacts to resources affected by the proposed project and by other past, present and reasonably foreseeable future activities in the watershed. According to the Council on Environmental Quality's regulations for implementing NEPA (50 CFR ξ1508.7), a "cumulative impact" is an impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. It focuses on whether the proposed action, considered together with any known or reasonably foreseeable actions by the USBR, other Federal or state agencies, or some other entity combined to cause an effect. There is no defined area for potential cumulative effects. As a result, it is determined that the proposed project would not have a significant adverse cumulative effect on any resources.

# CHAPTER 4 - CONSULTATION AND COORDINATION

## *National Historic Preservation Act*

The National Historic Preservation Act (NHPA) of 1966, as amended, is the primary legislation that outlines the Federal government's responsibility to cultural resources. Cultural resources include both archaeological and built environment resources. Section 106 of the NHPA requires that Federal agencies take into consideration the effects of their undertakings on historic properties. Historic properties are cultural resources that are listed on or eligible for inclusion in the National Register of Historic Places (National Register). The 36 CFR Part 800 regulations implement Section 106 of the NHPA and outline the procedures necessary for compliance with the NHPA.

Compliance with the Section 106 process follows a series of steps that are designed to identify if cultural resources are present and to what level they will be affected by the proposed Federal undertaking. The Federal agency must first determine if the proposed action is the type of action that has the potential to affect historic properties. Once that has been determined and an action, or undertaking, has been identified, the Federal agency must identify interested parties, determine the area of potential effect (APE), conduct cultural resource inventories, determine if historic properties are present within the APE, and assess effects on any identified historic properties. The Federal agency consults with the State Historic Preservation Officer (SHPO) on agency determinations and findings and seeks their concurrence with the Federal agency findings.

The Lewiston Dam and Power Plant System is a historic property, eligible for list on the National Register of Historic Places as a component of the CVP for its association with the storage and diversion of Trinity River water for use as part of the CVP. Reclamation is consulting with the California SHPO under section 106 of the National Historic Preservation Act (NHPA). Reasonable mitigation measures identified during these consultations will be implemented through the NHPA section 106 process.

## *Endangered Species Act*

Reclamation consulted with the NOAA Fisheries about the effects of the proposed project on threatened coho salmon in the Trinity River, pursuant to section 7 of the federal Endangered Species Act. On July 5, 2011, NOAA Fisheries concurred with Reclamation's determination that the proposed action would not adversely affect threatened coho salmon, nor destroy or adversely modify designated critical habitat.

# CHAPTER 5 – PREPARERS

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## CHAPTER 6 - REFERENCES


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**Attachment A**
**Terrestrial Wildlife Biological Evaluation**

**Attachment B**
**Fishery Resources Technical Report**

**Attachment C**
**Dirtbag Information**