APPENDIX E2

YUBA COUNTY WATER AGENCY'S PROPOSED CONDITIONS AND ASSOCIATED RATIONALE STATEMENTS

Provided below are the operations and management activities that YCWA proposes to undertake as conditions of the new license for the Project for the purpose of protecting or mitigating impacts that would otherwise result from YCWA's proposed Project as described in this Application for a New License, or for the purpose of enhancing resources that could be affected by the proposed Project. YCWA's rationale statement for each proposed condition follows the condition.

For the purpose of this appendix, YCWA has assumed that FERC's requirements regarding inspections of Project facilities (e.g., annual FERC inspections, Part 12 Dam Safety Inspections, and Environmental and Public Use Inspections) and other similar general FERC requirements (e.g., requirement for Emergency Action Plans) will apply to the Proposed Project if FERC issues a new license. YCWA also has assumed the specific requirements included in related approvals, such as dam certificates issued by DSOD for Project dams within DSOD's jurisdiction and appropriative water rights licensed by the SWRCB for power generation will not change under a new license. Therefore, YCWA has not included proposed conditions related to these activities in this Application for New License.

In addition, for the purpose of this appendix, YCWA has assumed that FERC will include in the new license FERC's 37 *Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters and Lands of the United States* (Form L-5 Standard Articles).[1] Therefore, YCWA has not included proposed conditions that would otherwise be addressed by FERC's Form L-5 Standard Articles, which are included in Attachment 1 to this Appendix E2.

YCWA has made no attempt to include or anticipate Forest Service's "standard" administrative FPA Section 4(e) terms and conditions.[2] In its February 28, 2014 comments on YCWA's DLA, the Forest Service said it would file these standard administrative terms and conditions when it files its preliminary FPA Section 4(e) terms and conditions. YCWA will review the Forest Service's "standard" administrative terms and conditions and other terms and conditions when the Forest Service files them with FERC, and address each one, as appropriate, at that time. YCWA also has made no attempt to include or anticipate any "standard" administrative FPA Section 4(e) terms and conditions that may be filed by the USACE.

[1] L–5: *Constructed Major Project Affecting Navigable Waters and Lands of the United States*, 12 F.P.C. 1329 (October 23, 1953), 17 F.P.C. 110 (January 13, 1957), 38 F.P.C. 203 (July 26, 1967), 54 F.P.C. 1832 (October 31, 1975).

[2] In the recent NID Yuba-Bear Hydroelectric Project relicensing, the Forest Service's November 20, 2013 final FPA Section 4(e) terms and conditions included 24 "standard" administrative conditions.

YCWA has indicated for each of its proposed conditions if the proposed condition is a continuation of a condition in the existing FERC license or a continuation of other agreements that pertain to the Project.

Table E2-1 provides a listing of the conditions YCWA has included in its Proposed Project.

Table E2-1. Conditions proposed by YCWA for inclusion in its Proposed Project.

YCWA's Proposed Condition	Description	Page in Appendix E2
GENERAL		
GEN1	Meet with Agencies and Indian Tribes Annually	E2-3
GEN2	Review Special-status Species Lists and Assess Newly-listed Species Annually	E2-5
GEN3	Provide Environmental Training to Employees	E2-6
GEN4	Develop and Implement a Coordinated Operations Plan for Yuba River Development Project and Narrows Project	E2-7
GEOLOGY AND SOILS		
GS1	Implement Erosion and Sediment Control Plan[1]	E2-8
GS2	Implement Our House and Log Cabin Diversion Dams Sediment Management Plan[1]	E2-9
GS3	Pass Large Woody Material at Our House and Log Cabin Diversion Dams	E2-10
GS4	Implement New Bullards Bar Reservoir Floating Material Management Plan[1]	E2-11
WATER RESOURCES		
WR1	Implement Hazardous Materials Management Plan[1]	E2-12
WR2	Determine Water Year Types for Conditions Pertaining to Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam	E2-12
WR3	Determine Water Year Types for Conditions Pertaining to Narrows 2 Powerhouse and Narrows 2 Full Bypass	E2-17
WR4	Implement Streamflow and Reservoir Level Compliance Monitoring Plan[1]	E2-20
WR5	Maintain New Bullards Bar Reservoir Minimum Pool	E2-21
WR6	Operate New Bullards Bar Reservoir for Flood Control	E2-22
AQUATIC RESOURCES		
AR1	Maintain Minimum Streamflows below Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam	E2-24
AR2	Control Project Spills at Our House Diversion Dam	E2-43
AR3	Maintain Minimum Streamflows at Narrows 2 Powerhouse and Narrows 2 Full Bypass	E2-47
AR4	Control Project Spills at New Bullards Bar Dam	E2-52
AR5	Implement Aquatic Invasive Species Management Plan[1]	E2-52
AR6	Implement New Bullards Bar Reservoir Fish Stocking Plan[1]	E2-53
AR7	Implement Upper Yuba River Aquatic Monitoring Plan[1]	E2-53
TERRESTRIAL RESOURCES		
TR1	Implement Integrated Vegetation Management Plan[1]	E2-55
TR2	Implement Bald Eagle and American Peregrine Falcon Management Plan[1]	E2-56
TR3	Implement Ringtail Management Plan[1]	E2-56
TR4	Implement Bat Management Plan[1]	E2-57
ESA-LISTED SPECIES		
TE1	Monitor Water Temperature Downstream of Narrows 2 Powerhouse	E2-57
TE2	Monitor Chinook Salmon Downstream of Narrows 2 Powerhouse	E2-57
TE3	Establish Lower Yuba River Anadromous Fish Ecological Group	E2-58
TE4	Control Project Ramping and Flow Fluctuations Downstream of Englebright Dam	E2-59
RECREATION RESOURCES		
RR1	Implement Recreation Facilities Plan[1]	E2-62
RR2	Provide Recreation Flow Information	E2-63
LAND USE		
LU1	Implement Transportation System Management Plan[1]	E2-64
LU2	Implement Fire Prevention and Response Plan[1]	E2-64

Table E2-1. (continued)

YCWA's Proposed Condition	Description	Page in Appendix E2
CULTURAL RESOURCES		
CR1	Implement Historic Properties Management Plan[2]	E2-65
AESTHETIC RESOURCES		
VR1	Implement Visual Resource Management Plan[1]	E2-65

[1] This plan is included in Appendix E3 of Exhibit E of YCWA's Application for New License, and is considered public information.
[2] This plan is included in Volume V of YCWA's Application for New License, and is considered Privileged information.

E2.1 General

E2.1.1 YCWA's Proposed Condition GEN1: Meet with Agencies and Indian Tribes Annually

Licensee shall, beginning in the first full calendar year of the new license term and each year thereafter, schedule a meeting at YCWA's office in Marysville, California, for the Commission, Forest Service, BLM, USACE, NMFS, USFWS, CDFW, SWRCB, Indian tribes and SHPO on the third Thursday of April. The meeting shall have two parts. The agenda for the first part of the meeting, which will be open to the public, will include:

- Introductions
- Licensee describes results of its annual review of lists of special-status species (YCWA Proposed Condition GEN2), and discussion if any species has been added to the lists that has a potential to be affected by the Project
- Licensee addresses questions regarding FERC filings in the previous calendar year (e.g., monitoring reports)
- Licensee describes planned monitoring in the current calendar year
- Licensee makes recommendations regarding revisions to implementation and monitoring plans in FERC license, and discussion, if needed
- Licensee describes planned changes to FERC-licensed Project facilities or features, and discussion, if Licensee proposes any changes
- Identification of Licensee follow-up items
- Other items, as appropriate

The second part of the meeting shall be closed to the public because confidential cultural resources information may be discussed. Participants may include the Commission, Forest Service, BLM, USACE, Indian tribes and SHPO. The agenda shall include:

- Introductions

- Licensee addresses questions regarding implementation of the Historic Properties Management Plan (HPMP) in previous calendar year, and planned HPMP-activities in current calendar year
- Identification of follow-up items
- Other items, as appropriate

Licensee shall prepare a letter summary of each meeting including attendees, subjects discussed, and Licensee action items, if any. Licensee shall file the summaries, as appropriate (i.e., as Public and Privileged information) with the Commission no later than June 1 following the meeting.

At least 30 days in advance of each annual consultation meeting, Licensee shall make available to the agencies the following material:

- Reports required by implementation of monitoring plans in the license in the previous calendar year
- Records (i.e., mean daily flows) from gages to document compliance with streamflow requirements in the license for the previous water year (ending September 30 of the previous calendar year).

Rationale Statement in Support of YCWA's Condition GEN1. An annual meeting with FERC, agencies and Indian tribes would facilitate communications and assure that interested agencies and Indian tribes have an opportunity to discuss license implementation, which is solely the responsibility of YCWA, with YCWA. Implementation of Condition GEN1 would assure that FERC, agencies and Indian tribes have an opportunity to discuss the previous calendar year's license activities and understand YCWA's plans regarding license implementation in the current calendar year. YCWA would schedule with FERC, agencies and Indian tribes on the third Thursday of each year at its office. By setting the meeting date and meeting location in the license condition, all parties interested in attending the meeting have due notification and may plan accordingly. In addition, the meeting date provides adequate time for YCWA to issue and interested parties to review all reports from the previous calendar year, and for YCWA to have planned its license implementation activities for the current calendar year. The second part of the meeting would be closed to the public since confidential cultural resource information may be discussed (NHPA § 106 and 36 C.F.R § 800.2(d)(2)). YCWA would file documentation of the meeting with FERC. The condition provides that the cultural resources portion of the meeting summary may be filed as Privileged due to the confidential nature of the material.

Condition GEN1 does not imply that YCWA may not proceed with license implementation until after the annual meeting, or that agencies' or Indian tribe's approval is needed for YCWA to implement the terms and conditions in the license. Nor does the condition imply that YCWA will consult with the agencies or Indian tribes only once each year: YCWA intends to consult as needed during other times of the year and as otherwise necessary.

E2.1.2 YCWA's Proposed Condition GEN2: Review Special-Status Species Lists and Assess Newly-listed Species Annually

Licensee shall, beginning the first year of the new license term, annually review the current lists of special-status species (i.e., species that are listed by the Forest Service as Sensitive; listed by the Plumas or Tahoe national forests as sensitive or watchlist species; listed by the State of California as candidates for listing under California Endangered Species Act; listed by USFWS or NMFS as a species of concern; or listed by the State of California as a species of special concern)[3] to determine if any species that have been added to one of these lists since the last review under this condition might be directly affected by Project operations.

For any such newly added species that has a potential to be directly affected by the Project, Licensee shall develop, in consultation with the agency or agencies with jurisdiction over the species, a study plan to assess the effects of the Project on the species and its habitat potentially directly affected by the Project. The plan shall include that within a reasonable time after the study is completed, Licensee shall prepare a draft report including objectives, methods, results, recommended resource measures where appropriate, and a schedule of implementation, and shall provide the draft of the final report to agencies with jurisdiction over the species for review, and that Licensee shall file the report, including evidence of consultation, with the Commission. License shall file the study plan, with evidence of consultation, with the Commission within 30 days of finalizing the study plan, and shall implement the study plan as required by the Commission.

If Licensee proposes an action that could adversely affect the environment (e.g., construction or major modification of a new facility), Licensee shall review all special-status species lists in a timely manner, and consult with the appropriate agencies regarding the action's potential affects on special-status species and their habitats.

Rationale Statement in Support of YCWA's Condition GEN2. Over the term of the new license, it is possible that species that could be affected by the Project could be added to special-status species lists. Condition GEN2 requires that YCWA review pertinent special-status species lists annually to identify such species. An annual, rather than more frequent, review is appropriate because, even though some lists may be updated quarterly, changes to special-status species lists are usually very minor from year to year. The condition requires that if a species has been added to the list and has a reasonable likelihood of being directly affected by the Project and adequate information is not available to assess likely Project effects, YCWA would consult with the appropriate agencies with jurisdiction over the species to develop a study plan to assess potential Project effects, provide the plan to those agencies for review, file the plan with the Commission, and perform the study as approved by the Commission. Upon completion of the study, YCWA would provide a study report to the appropriate agencies for review, and file the report with the Commission. In addition, the condition requires that if YCWA proposes a

[3] Special-status species as described in this condition refer to species that are not afforded any special protection under federal or state law, but are of interest to an agency and are listed on a formal publication, which is periodically updated by that agency.

new action that could adversely affect a special-status species or its habitat, YCWA consult with the appropriate agencies.

This condition does not apply to species listed as threatened or endangered under the ESA or the CESA since the process for adding these species to the ESA or CESA is specifically described under federal and state law, as is the process for consulting with the appropriate agency once a species has been added to the ESA to CESA.

This condition does not preclude any agency or member of the public from notifying both YCWA and Commission if the agency or member of the public believes a species has been added to a special-status species list that may be adversely affected by the Project.

E2.1.3 YCWA's Proposed Condition GEN3: Provide Environmental Training to Employees

Licensee shall, beginning in the first year of the new license term, annually perform employee environmental awareness training for hydro field maintenance staff, and shall also perform such training for new hydro field maintenance staff within 1 month of when a staff member is first assigned to the Project. The training shall include: 1) identification and potential effects of the Project on special-status species known or suspected to occur within the FERC Project Boundary; 2) procedures to avoid effects to special-status species and cultural resources and the spread of non-native invasive species; 3) providing maps, or directions about how to access information about general locations of environmentally sensitive areas (e.g., locations of cultural properties, non-native invasive species, special-status species, and protected habitats) within the FERC Project Boundary; and 4) reporting procedures to Licensee's management if new populations of special-status species are observed. The goal of the training shall be to familiarize Licensee's operations and maintenance staff with known special-status species, non-native invasive species, and sensitive areas within the FERC Project Boundary. It is not the intent of this condition that Licensee's operations and maintenance staff perform surveys or become experts (i.e., have more than a common knowledge) in the identification of special-status species, non-native invasive species or historic properties. Licensee shall direct its staff to avoid disturbance to sensitive areas, and to advise all Licensee contractors to avoid sensitive areas. If Licensee determines that disturbance of a sensitive area is unavoidable, License shall consult with the appropriate agencies to minimize adverse effects to the sensitive area.

Rationale Statement in Support of YCWA's Condition GEN3. Over the course of the relicensing, YCWA has identified sensitive areas (e.g., locations of cultural properties, non-native invasive species, special-status species, and protected habitats), and other such areas may be identified over the new license term. Under Condition GEN3, YCWA would prepare and maintain maps of sensitive areas within the FERC Project Boundary. Using this map and other material, YCWA would provide environmental sensitivity training to Project hydro field maintenance staff when they are assigned to the Project and provide group training to all hydro field maintenance staff annually. Providing training to staff when they are hired will assure new staff are quickly trained, and periodic training will serve as a refresher for staff to note any changes since the last training. Training would include the general identification of the special-

status species and non-native invasive species that are known or suspected to occur in the Project Boundary and their general location, methods to avoid sensitive areas and minimize disturbance of special-status species during critical life stages, and a review of any pertinent orders, rules or policies (e.g., BMPs and LOPs) that pertain to these special-status species that may occur in the Project Area. Training would also include procedures for reporting to YCWA's management if staff observes any Project activity directly affecting these special-status species, and procedures for YCWA management to report to the appropriate agencies, if necessary.

E2.1.4 YCWA's Proposed Condition GEN4: Develop and Implement a Coordinated Operations Plan for Yuba River Development Project and Narrows Project[4, 5]

Licensee shall, within the first 90 days of the new license term, file with the Commission for approval a Coordinated Operations Plan (Plan) for the Yuba River Development Project and Narrows Project (FERC Project No. 1403). Licensee shall develop the Plan in consultation with the licensee for the Narrows Project. The purpose of the Plan shall be to provide for coordinated operations of the Yuba River Development Project and the Narrows Project to assure implementation of the flow–related conditions in the two project licenses, including maintenance of minimum streamflows during scheduled outages. Licensee shall file the Plan with the Commission, and Licensee shall implement those portions of the Plan approved by the Commission that apply to Licensee. If Licensee and the licensee for the Narrows Project are unable to reach agreement on the Plan within the first 90 days of the new license term, then Licensee shall advise the Commission of the consultations that have occurred, and shall request that the Commission issue an appropriate order for coordinated operations to Licensee and the licensee for the Narrows Project.

Rationale Statement in Support of YCWA's Condition GEN4. Both YCWA's Narrows 2 Powerhouse and PG&E's Narrows Project receive water from Englebright Reservoir and measure their compliance with flow requirements in their licenses at a streamflow gage downstream of the Projects at Smartsville. Condition GEN4 provides that YCWA will consult with PG&E to develop a plan to assure implementation of flow requirements as required in this license. Further, the condition provides that if YCWA and PG&E cannot reach agreement on a coordinated operations plan, then YCWA will ask the Commission to issue an appropriate order. YCWA will file the coordinated operations plan with FERC for approval if agreement is reached. The condition does not require consultation with agencies because it is the sole responsibility of YCWA to meet the flow requirements in its license.

[4] YCWA has not included the Coordinated Operations Plan in YCWA's Application for New License because YCWA and PG&E, the licensee for the Narrows Project, cannot negotiate the terms of the plan until such time as each party understands the conditions of the new Yuba River Development Project license, which conditions will not be known until FERC issues the new license.

[5] Article 411 in the existing the existing FERC license for PG&E's Narrows Project (FERC Project No. 1403) states: "*The Licensee* [PG&E] *shall, for the limited purpose of coordinating operations with Project 2246 for the development of fish resources in the Yuba River downstream of Englebright dam, comply with such reasonable modifications of project operations, as may be ordered by the Commission upon the relicensing or amendment of the license for FERC Project No. 2246, after notice and opportunity for hearing.*" The existing FERC license for PG&E's Narrows Project expires in 2023.

E2.2 Geology and Soils

E2.2.1 YCWA's Proposed Condition GS1: Implement Erosion and Sediment Control Plan[6, 7]

Licensee shall implement the Erosion and Sediment Control Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition GS1. Over the term of the new license, YCWA may need to stabilize slopes. Condition GS1 provides a generic erosion and sediment control plan that describes the consultation YCWA will initiate and measures YCWA will employ to control sediment and erosion when stabilizing slopes affected by the Project.

The plan would be implemented in coordination with other plans in the license (e.g., Integrated Vegetation Management Plan and Transportation System Management Plan) that address, at least in part, erosion and sediment control actions.

This condition does not relieve YCWA of consulting with appropriate agencies for specific work and developing work-specific sediment and erosion control plans, where required, with an agency with jurisdiction over the work. It is anticipated that Condition GS1 provides an adequate plan for most work, but not all work that involves erosion and sediment control. Further, this condition does not relieve YCWA from obtaining all necessary permits and approvals for the work.

E2.2.2 YCWA's Proposed Condition GS2: Implement Log Cabin and Our House Diversion Dams Sediment Management Plan[8, 9, 10]

Licensee shall implement the Our House and Log Cabin Diversion Dams Sediment Management Plan included in Licensee's application for new license, as approved by the Commission.

[6] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[7] This condition overlaps in part with Article 19 in FERC's Form-L5 Standard Articles.
[8] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[9] This condition overlaps in part with Articles 19 and 21 in FERC's Form-L5 Standard Articles.
[10] In 2013, YCWA advised FERC and agencies that sediment in the Log Cabin Diversion Dam impoundment had blocked the low level outlet and was threatening to block the fish-flow release valve. In response to that pending environmental emergency, YCWA worked with agencies to implement remedial actions near the fish-flow release valve that, to date, have been successful in keeping the fish-flow release valve in full operation. In addition, in a letter dated November 5, 2013, FERC directed YCWA to develop a plan for the permanent, long-term solution for sediment control at Log Cabin Diversion Dam, and to file the plan with FERC for approval. YCWA met with agencies on March 24, April 9, and April 21, 2014 and exchanged emails at other times to discuss a draft plan developed by YCWA. YCWA intends to file that plan in May 2014. The plan included in YCWA's Proposed Condition GS2 is generally the same plan as the one filed with FERC on April 27, 2014 with the exception that The Log Cabin and Our House Diversion Dams Sediment Management Plan included in the FLA does not include channel morphology monitoring because YCWA proposed in the FLA a separate Upper Yuba River Aquatic Monitoring Plan (YCWA proposed Condition AR7), which includes channel morphology monitoring.

Rationale Statement in Support of YCWA's Condition GS2. Historically, operations of both Log Cabin and Our House diversion dam have been impacted by sediment accumulations in the impoundments, especially following unusually large storms, which have occurred approximately once every 10 to 20 years.

Condition GS2 provides for a plan regarding how sediment will be passed through Log Cabin and Our House diversion dams in most years; and how material will be removed from, transported and disposed of after large storms, which may overwhelm regular sediment bypass operations in other years. The plan also describes the permits and approvals needed to implement the plan, and the consultation YCWA would undertake to revise the plan, if needed.

Given that large storms periodically deposit large amounts of sediment in the Log Cabin and Our House diversion dams impoundments, the plan rightly describes how this material will be removed, transported and disposed of on non-federal land.

Opening of a low level outlet in a diversion dam is an effective measure to pass sediment that otherwise would accumulate behind the dam, to the river downstream of the dam. This continuous supply of sediment aids in the proper ecological function of the river, and, under normal conditions, mitigates the potential for sediment to accumulate behind the dam and clog the outlets. Condition GEN2 provides that each year, at the appropriate time and when hydraulic conditions are favorable, YCWA will open the low level valves in Our House Diversion Dam and Log Cabin Diversion Dam. Specifically, the strategy is to open the valves for brief periods in the winter when the majority of the water would pass through the outlet – not over the dam – to maximize direction of flow and movement of sediment in the impoundment, and when a high flow is expected to occur soon after, to continue moving and redistributing sediment downstream of the dam after the pass-through event. The event is scheduled for winter so that the high spring flows will continue to mobilize and redistribute moderate size sediment below the dam. Based on historic hydrology, YCWA expects that this measure would be implemented, on average, every other year at Our House Diversion Dam and once every 3 to 4 years at Log Cabin Diversion Dam.

Opening the low level outlets is expected to be beneficial to aquatic resources in the streams below the dams. Fish populations in Project reaches were generally determined by studies performed in the FERC relicensing process to be healthy and persistent transitional fisheries with age class distributions indicative of natural reproduction. However, several studies suggest that availability of suitably sized spawning gravels is limited. According to YCWA's Technical Memorandum 3-10, *Instream Flow Upstream of Englebright Reservoir,* rainbow trout spawning WUA was quite limited in most reaches due to patchy and limited distribution of suitable spawning substrate. Where suitable substrate was recorded, the preferred combination of depths and velocities often were not present. Passage of sediments will likely improve habitat by increasing the amount of substrate within the wetted channel available for rainbow trout spawning.

In addition, opening the low level outlets is expected to be beneficial to FYLF. Currently, moderate sized sediments (i.e., gravel and small cobbles) and shallow margin habitat are relatively scarce below Our House Diversion Dam, which may limit conditions for FYLF

breeding and rearing. Passage of sediments will likely improve habitat by increasing the amount of substrate available for egg-attachment and shallow margins for tadpoles.

Condition GS2 is designed to pass sediment though Our House and Log Cabin diversion dams and for the sediment then to be redistributed downstream by high flows occurring at the end of the sediment pass-though event and during the following spring. The proposed condition could result in fine material being deposited downstream, although this is unlikely. Therefore, YCWA has included in its proposed Condition AR7, Upper Yuba River Aquatic Monitoring Plan, which provides for periodic monitoring of channel morphology and riparian vegetation downstream of Log Cabin and Our House Diversion dams. Surveys, at the same locations at which channel morphology and riparian vegetation surveys were performed during relicensing studies, and using survey methods similar to those used during the relicensing studies, would occur periodically to confirm that the channel remains in a proper functioning condition. Further, Condition AR7 requires YCWA to provide a monitoring report to interested agencies for review and comment prior to filing the report with the Commission.

E2.2.3 YCWA's Proposed Condition GS3: Pass Large Woody Material at Our House and Log Cabin Diversion Dams

Licensee shall allow, provided conditions permit safe and reasonable access and working conditions, mobile instream large woody material to pass the Our House and Log Cabin diversion dams into downstream reaches. All sizes of large woody material greater than 8 inches in diameter and up to 36 feet in length shall be allowed to pass downstream past the dams. If it is reasonably necessary to decrease the length of large woody material to allow handling to implement this condition, then Licensee may cut such woody material into shorter lengths. Notwithstanding this requirement, if the Commission or the California Division of Safety of Dams requires Licensee to remove large woody material from the dams or dam spillways, then Licensee shall do so; and if a federal or state agency or Yuba County expresses a concern about the potential effects of this condition on the safety or maintenance of downstream bridges, then Licensee shall not implement this condition. Licensee shall not be required to maintain or otherwise fund maintenance of downstream bridges or culverts, or otherwise be responsible for damages to downstream bridges due to passage of large woody material.

Rationale Statement in Support of YCWA's Condition GS3. Some agency representatives have opined that allowing large woody material (LWM) to pass Our House Diversion Dam and Log Cabin Diversion Dam into downstream reaches would improve proper ecological function of the river. Historically, large woody material overtops the diversion dams, with a small portion accumulating on the diversion tunnel's trash racks. Large material on the trash racks has been removed and disposed of, while smaller material passes through the tunnels. Condition GEN3 provides that YCWA shall pass LWM downstream of diversion dams, which will require YCWA to place the materials that otherwise would be disposed of in locations that will allow it to pass over the dams. This condition acknowledges that implementation of the condition would not make YCWA liable for damage to bridges or culverts due to large wood.

This condition, if included in the new license, would not require YCWA to obtain any permits or approvals to implement the condition.

E2.2.4 YCWA's Proposed Condition GS4: Implement New Bullards Bar Reservoir Floating Material Management Plan

Licensee shall implement the New Bullards Bar Reservoir Floating Material Management Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition GS4. The Forest Service requested that YCWA include a plan describing the annual collection, piling and disposal of floating material on New Bullards Bar Reservoir because these actions affect NFS land and resources. YCWA believes this is a reasonable request, and has included the plan in YCWA's Proposed Condition GS4. The plan specifies how floating material would be collected and where it would be piled, including the conditions of the piles. Two primary sites would be used and a third site is shown as a back-up, if needed. The plan includes YCWA's access to the sites.

E2.3 Water Resources

E2.3.1 YCWA's Proposed Condition WR1: Implement Hazardous Materials Management Plan[11, 12]

Licensee shall implement the Hazardous Materials Management Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition WR1. Over the term of the new license, YCWA may need to perform work that involves use of hazardous materials. Condition WR1 provides a description of hazardous material used at the Project by location, and includes a generic hazardous materials management plan that describes how YCWA will manage hazardous materials in the future.

This condition does not relieve YCWA of the requirements to consult with appropriate agencies for specific work and to develop work-specific hazardous materials management plans, where required by an agency with jurisdiction over the work. It is anticipated that Condition WR1 provides an adequate plan for most work, but not all work that involves use or management of hazardous materials. Further, this condition does not relieve YCWA from having to obtain all necessary permits and approvals for the work.

[11] This plan is included in Appendix E3 of Exhibit E of Application for New License.

[12] On April 10, 2014, YCWA, the Forest Service and Cal Fish and Wildlife each stated it "could live with" this plan (i.e., YCWA staff would recommend to its Board that the plan be included unchanged from the plan that was agreed to in YCWA's FLA, which it has been; the Forest Service staff said it would recommend to its management that the plan be include unchanged in the Forest Service's preliminary FPA Section 4(e) conditions; and Cal Fish and Wildlife staff said it would recommend to its management that the plan be include unchanged in Cal Fish and Wildlife's FPA Section 10(j) recommendations). If each agency does not do this, YCWA reserves it s right to file a revised plan since the plan include in this FLA was a negotiated plan.

E2.3.2 YCWA's Proposed Condition WR2: Determine Water Year Types for Conditions Pertaining to Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam

Beginning within the first 90 days of the new license term, Licensee shall in each year in each of the months of February, March, April, May and October determine the applicable water year type described in Table 1 of this condition. Licensee shall use this determination to implement articles and conditions of the license that are dependent on water year type and that concern flows in the Middle Yuba River downstream of Our House Diversion Dam, in Oregon Creek downstream of Log Cabin Diversion Dam and in the North Yuba River downstream of New Bullards Bar Dam. Water year types for these articles and conditions shall be defined as listed in Table 1 of this condition.

Table 1. Water Year types for the Yuba River Development Project in the Middle Yuba River downstream of Our House Diversion Dam, in Oregon Creek downstream of Log Cabin Diversion Dam and in the North Yuba River downstream of New Bullards Bar Dam.

Water Year Type	DWR Forecast of Total Unimpaired Runoff in the Yuba River at Smartsville in Thousand Acre-Feet or DWR Full Natural Flow Near Smartsville for the Water Year in Thousand Acre-Feet[1]
Wet	Greater than 3,240
Above Normal	2,191 to 3,240
Below Normal	1,461 to 2,190
Dry	901 to 1,460
Critically Dry	616 to 900
Extreme Critically Dry[2]	Equal to or Less than 615

[1] DWR rounds the Bulletin 120 forecast to the nearest 1,000 acre-feet. The Full Natural Flow is provided to the nearest acre-foot, and Licensee will round DWR's Full Natural Flow to the nearest 1,000 acre-feet.

[2] A Critically Dry Water Year that follows an Extreme Critically Dry Water Year or a Critically Dry Water Year shall be considered an Extreme Critically Dry Water Year.

In each of the months of February, March, April and May, the water year type shall be based on California Department of Water Resources (DWR) water year forecast of unimpaired runoff in the Yuba River at Smartsville as set forth in DWR's Bulletin 120 entitled "Water Year Conditions in California." DWR's forecast published in February, March and April shall apply from the 16th day of that month through the 15th day of the next month. From May 15 through October 14, the water year type shall be based on DWR's forecast published in May.

From October 16 through February 15 of the following year, the water year type shall be based on the sum of DWR's monthly (not daily) full natural flow for the full water year for the Yuba River near Smartsville, as made available by DWR on the California Data Exchange Center (CDEC) in the folder named "FNF Sum." Currently these data are available at: http://cdec.water.ca.gov/cgi-progs/stages/FNFSUM. If DWR does not make the full natural flow for the full water year available until after October 14 but prior to or on October 31, from 3 days after the date the full natural flow is made available until February 15 of the following year, the water year type shall be based on the sum of DWR's monthly full natural flow for the full water year as made available. If DWR does not make available the final full natural flow by October 31, the water year type from November 1 through February 15 of the following year shall be based on DWR's May Bulletin 120.

Rationale Statement in Support of YCWA's Condition WR2. Recently, the Forest Service, USFWS, Cal Fish and Wildlife, SWRCB and FWN collaboratively agreed to WY classifications for use in NID's Yuba-Bear Hydroelectric Project new license and PG&E's Drum-Spaulding Project new license, each of which is located in the Yuba River watershed upstream of the Project. Early in the Yuba River Development Project relicensing, these agencies suggested these WY classifications be used for Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam. While YCWA believed it would be appropriate to use the WY classifications for releases from the Narrows Powerhouse described in Condition WR3 (Section E2.3.3), or to improve the WY classifications for these upstream projects for use in the Project (e.g., the upstream protects are mostly snowmelt driven while Our House and Log Cabin diversion dam are more rain storm driven), YCWA agreed that the WY classifications for these upstream projects are adequate and thus to propose them, with the exception described below, in this condition. YCWA did not agree to use these WY classifications for releases from the Narrows Powerhouse for the valid reasons described under Condition WR4 (Section E2.3.3).

The six WY classifications for these upstream projects use as an index DWR's forecasts for annual unimpaired flow volume at the Yuba River at Smartsville.[13] For a given year, the WY classification is adjusted five times - in February, March, April, May and October. Each of the WY classifications is described below, and a distribution of WY classifications over the 41-year relicensing Period of Record (WY 1970 through WY 2010) is shown in Figure E2-1.

- Extreme Critically Dry – This WY classification is a very, very dry water year, and includes only WY 1977 from 1970 through 2010.
- Critically Dry – This classification of WY has extremely low streamflows in all seasons as compared to median conditions, due to a negligible snowpack and a lack of spring rain events to augment the flow. This leads to a dry watershed throughout the spring and summer months.
- Dry – This WY classification is typified by relatively low streamflows in the late winter and early spring due to a limited snowpack, and with no spring rain events to augment the flow. This leads to a dry watershed throughout the late spring and summer months.
- Below Normal – The Below Normal WY classification has a similar hydrograph shape to the Dry WY in the late winter and early spring due to a similar snowmelt, but these years typically have higher volumes of spring and early summer runoff that help to recharge the watershed during those months.
- Above Normal – This WY classification includes a relatively large snowmelt that starts in early spring and lasts through early summer, along with several storm events that cause spikes in the hydrograph throughout the spring. A larger than normal amount of flow can still be seen in the watershed by the end of the summer. In contrast to the Wet WY classification, there are no severe events that appear to have caused significant flooding during an Above Normal WY.

[13] These water year types are referred to as the "Smartsville Index" in Exhibit E.

- Wet – The Wet WY classification includes similar snowmelt characteristics to the Above Normal WY type, but is distinct in that it includes either several large spring storms or an especially large amount of snowmelt runoff. These runoff events often dwarf the remainder of the hydrograph and can act as geomorphic flushing flows. The late summer and fall portions of the Wet WY hydrograph are similar to an Above Normal WY.

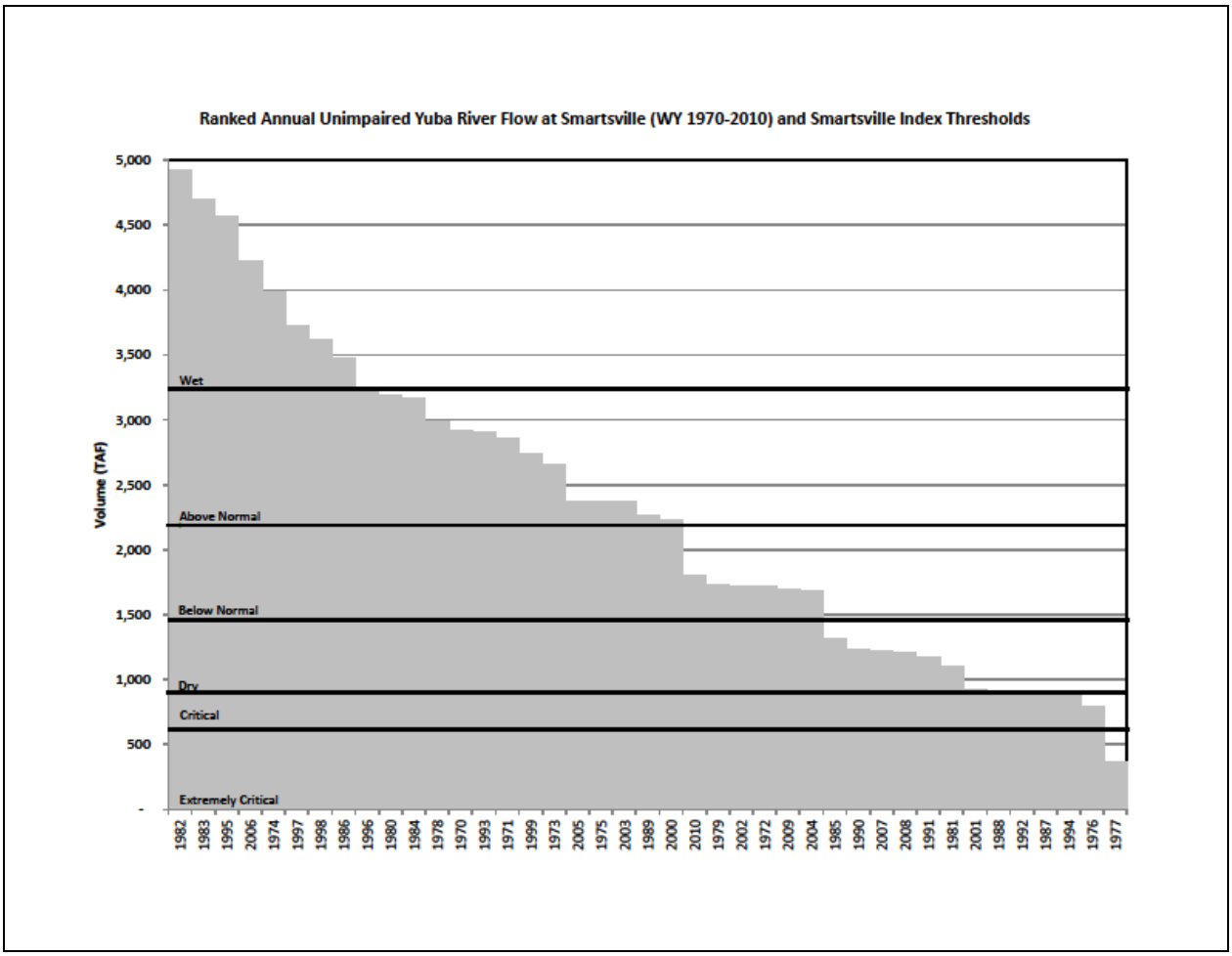

Figure E2-1. Distribution of WY classifications from WY 1970 through WY 2010 by WY type.

The exception to the upstream WY classifications that is included in Condition WR2 is that the condition provides that if a Critically Dry WY follows an Extreme Critically WY or Critically Dry WY, then the Critically Dry WY will be treated as an Extreme Critically Dry WY.

Table E2-2 provides a comparison between this WY type classification and the North Yuba Index, which is described in Condition WR3. Significantly, the index values are not directly comparable since each uses different components to calculate the index.

Table E2-2. Comparison between the WY types in YCWA's proposed Condition WR2 and the WY types in YCWA's proposed Condition WR3 over the 41-year long relicensing period of Record (WY 1970 through WY 2010) based on DWR's April 1 Bulletin 120.

YCWA's Proposed Condition WR2 for Our House, Log Cabin and New Bullards Bar Dams (aka, the Smartsville index)			YCWA's Proposed Condition WR3 for Narrows 2 Powerhouse and Full Bypass (aka, the North Yuba Index)		
Water Year Classification	**Index Value (Units = ac-ft)**	**Count (Number of WYs)**	**Water Year Classification**	**Index Value (No Units)**	**Count (Number of WYs)[1]**
Wet	≥3,240	9 (1974, 1980, 1982, 1983, 1986, 1995, 1997, 1998, 2006)	Schedule 1	≥1,400	22 (1970, 1971, 1973, 1974, 1975, 1978, 1980, 1982, 1983, 1984, 1986, 1989, 1993, 1995, 1996, 1997, 1998, 1999, 2000, 2003, 2005, 2006)
Above Normal	≥2,191	11 (1970, 1971, 1973, 1975, 1978, 1984, 1989, 1993, 1996, 1999, 2000)	Schedule 2	≥1,040	10 (1972, 1979, 1985, 1991, 2002, 2004, 2007, 2008, 2009, 2010)
Below Normal	≥1,461	9 (1972, 1979, 1985, 2002, 2003, 2004, 2005, 2009, 2010)	Schedule 3	≥920	5 (1981, 1987, 1990, 1992, 1994)
Dry	≥901	9 (1981, 1987, 1990, 1991, 1992, 1994, 2001, 2007, 2008)	Schedule 4	≥820	2 (1976, 2001)
Critically Dry	≥616	2 (1976,1988)	Schedule 5	≥693	1 (1988)
Extreme Critically Dry	<616	1 (1977)	Schedule 6	≥500	0
--	--	--	Conference Year	<500	1 (1977)
6 Classifications	**--**	**41 WYs**	**7 Classifications**	**--**	**41 WYs**

[1] Based on Operations Model Base Case Scenario Run. Changes to the Base Case Scenario Run may result in changes to New Bullards Bar Reservoir storage and, therefore, changes to the distribution of WYs shown in the table for Condition WR3.

YCWA's proposed Project includes two conditions defining distinct WY-type classifications, one for reaches above Englebright Reservoir (WR2), and one for reaches below the Narrows 2 Powerhouse (WR3). Due to the different management approaches used for the two reaches, two WY classifications are needed.

In the Middle Yuba and North Yuba rivers, and Oregon Creek, operations for minimum flows does not necessitate a consideration for reservoir storage - the nature of operations of Our House Diversion Dam and the Log Cabin Diversion Dam is such that they are purely driven by inflow, there is no storage.

In the North Yuba River below New Bullards Bar Dam, overall basin wetness, as indicated by the Smartsville Index, is not a limiting factor for flow; the relative location of the intake to New Bullards Bar Dam's low level outlet and the Minimum Flow Powerhouse provides a large water supply for release to the North Yuba River. However, the minimum flows on the North Yuba River below New Bullards Bar Dam are designed to provide flows for habitat on the Yuba River above the New Colgate Powerhouse. Therefore, in order to synchronize releases to the North Yuba River with flows on the Middle Yuba River and Oregon Creek, the same index that is used on the Middle Yuba River and Oregon Creek needs to be used for minimum flows below New

Bullards Bar Dam. Therefore, the Smartsville Index is an appropriate index to determine minimum flows on the North Yuba River below New Bullards Bar Dam.

Conversely, in the Yuba River below the Narrows 2 Powerhouse, available water supply in the New Bullards Bar Reservoir and its inflow for the year is extremely relevant for determining minimum flows below the Narrows 2 Powerhouse. The nature of late summer and early fall water temperatures and the flow-related habitat in the Yuba River below the Narrows 2 Powerhouse is such that storage within New Bullards Bar Reservoir is needed to supplement natural flows to provide substantially improved habitat conditions. Therefore, it is appropriate to connect the minimum flows on the Yuba River below the Narrows 2 Powerhouse to water supply available to YCWA: New Bullards Bar Reservoir storage and inflow throughout the year, rather than by a general index of basin wetness and inflows only. As shown in Table E2-2, use of the North Yuba Index, combining New Bullards Bar Reservoir storage and inflow, provides for more years to be grouped into the wetter classifications (Schedules 1 and 2) as compared to the number of years similarly classified under the Smartsville Index (Wet WYs).

E2.3.3 YCWA's Proposed Condition WR3: Determine Water Year Types for Conditions Pertaining to Narrows 2 Powerhouse and Narrows 2 Full Bypass[14]

Beginning within the first 90 days of the new license term, Licensee shall, using the DWR-published Bulletin 120, each year in each of the months of February, March, April and May, and then thereafter whenever DWR issues an update to the Bulletin 120, determine the applicable water year type as described in Table 1 of this condition. Licensee shall use this determination to implement articles and conditions of the license that are dependent on water year type and that concern flows in the Yuba River downstream of the combined releases of Narrows 2 Powerhouse and Narrows 2 Full Bypass. Water year types for these articles and conditions shall be based on the North Yuba Index as defined in Table 1 of this condition.

Table 1. North Yuba Index.

Water Year Type	Thousands of Acre-Feet
Schedule 1	Equal to or greater than 1,400
Schedule 2	Equal to or greater than 1,040 and less than 1,400
Schedule 3	Equal to or greater than 920 and less than 1,040
Schedule 4	Equal to or greater than 820 and less than 920
Schedule 5	Equal to or greater than 693 and less than 820
Schedule 6	Equal to or greater than 500 and less than 693
Conference Year	Less than 500

The North Yuba Index shall be defined as follows:

$$\text{North Yuba Index} = Sa^{NBB} + I^{NBB}$$

[14] The schedules in this proposed condition are the same as the schedules described in Exhibits 2, 4 and 5 of the Lower Yuba River Fisheries Agreement. The instream flow requirements in the SWRCB's Corrected Order WR 2008-0014 are based on these flow schedules. (See SWRCB Corrected Order WR 2008-0014, p. 59, term 5.)

where Sa^{NBB} is the actual recorded amount of water in storage in New Bullards Bar Reservoir on September 30 of the previous water year as reported for USGS gage 11413515 minus 234,000 acre-feet; and I^{NBB} is calculated as follows:

I^{NBB} = Total Actual Inflow to New Bullards Bar Reservoir
from October 1 to the end of $Month^{i-1}$
+ Forecasted Inflow from the Beginning of $Month^{i}$ to September 30
($Month^{i-1}$ is the previous month and $Month^{i}$ is the current month)

where Total Actual Inflow to New Bullards Bar Reservoir from October 1 to the end of $Month^{i-1}$ is the calculated inflow in thousands of acre-feet based on a monthly summation of inflow as follows:

Total Actual Inflow to New Bullards Bar Reservoir from October 1 to the end of $Month^{i-1}$
= Monthly change in stored water + Monthly outflow

and where the Forecasted Inflow from the Beginning of $Month^{i}$ to September 30 is calculated as follows:

Forecasted Inflow to NBB^{i} = February NBB Inflow
+ March Inflow + April-July Inflow + August-September Inflow

Forecasted inflow to NBB shall be determined for each month using statistically-derived linear coefficients shown in Table 2 of this condition, applied to the measured inflow to New Bullards Bar Reservoir and the DWR's Bulletin 120 for February, March, April, and May, and subsequent updates of forecasts of unimpaired flow of the North Yuba River at Goodyears Bar (USGS Gage 11413000) and at the Yuba River at Smartsville (USGS Gage 11418000). DWR's forecast published in February, March, and April shall apply from the 15th day of that month to the 14th day of the next month. After May 15, the index will be recalculated for each subsequent Bulletin 120 update, and the index shall apply until two days after the next update. The index determined by the final Bulletin 120 update for the water year shall remain in effect until February 14 of the following water year.

Table 2. Coefficients for the calculation of Forecasted Inflow from the beginning of "$Month^{i}$" to September 30.

Forecast Month	Forecasted For	Constant (C) (ac-ft)	Total Actual Inflow to New Bullards Bar Reservoir[3] (C1) (no units)	Bulletin 120[2,4] Forecasted Smartsville (C2) (no units)	Bulletin 120[2] Forecasted Goodyear's Bar (C3) (no units)
February	February	-2,146	0.01424	0.52533	--
	March	-3,221	0.02458	0.54787	--
	April-July	-30,416	0.01413	0.62473	-0.24081
	August-September	--	0.01593	0.64037	--
March	March	-23,495	0.00596	0.55386	--
	April-July	-31,134	0.01237	0.62162	-0.23266
	August-September	--	0.01473	0.59396	--
April	April-July	-30,665	0.00547	0.61332	-0.19623
	August-September	--	0.01409	0.53241	--

Table 2. (continued)

Forecast Month	Forecasted For	Constant (C) (ac-ft)	Total Actual Inflow to New Bullards Bar Reservoir[3] (C1) (no units)	Bulletin 120[2,4] Forecasted Smartsville (C2) (no units)	Bulletin 120[2] Forecasted Goodyear's Bar (C3) (no units)
May[1,5]	April-July	-31,652	0.01033	0.61645	-0.22353
	August-September	--	0.01298	0.50071	--

[1] For all subsequent forecast updates, the May coefficients shall be used, with the forecasted Goodyears Bar runoff equaling 0.273 times the current forecasted Yuba River unimpaired flow at Smartsville.

[2] The Bulletin 120 forecasted flow for Smartsville and Goodyears Bar shall use the 50-percent exceedance forecasted flow.

[3] Total actual inflow means inflow to date from October 1 of the previous year

[4] "Forecasted Smartsville" is the DWR forecast for "Yuba River at Smartsville Plus Deer Creek"

[5] The May calculation of Forecasted NBB Inflow and subsequent updated calculations shall be reduced by the actual NBB inflow between April 1 and the calculation date.

Formula terms are only applicable as shown in Table 2 (e.g., the March forecast does not include a term for forecasted February NBB Inflow). The following formula shall be used to calculate the terms of the formula for Forecasted Inflow to NBB^i using the corresponding coefficients from Table 2):

- February NBB Inflow = C + C1 x Total Actual Inflow to NBB + C2 x Forecasted $Smartville^{(February)}$
- March NBB Inflow = C + C1 x Total Actual Inflow to NBB + C2 x Forecasted $Smartville^{(March)}$
- April – July Inflow = C + C1 x Total Actual Inflow to NBB + C2 x Forecasted $Smartville^{(April - July)}$ + C3 x Forecasted $Goodyears\ Bar^{(April - July)}$
- August - September Inflow = C1 x Total Actual Inflow to NBB + C2 x Forecasted $Smartville^{(August - September)}$

Terms are calculated in ac-ft and the result is converted to thousands of ac-ft for use in the calculation of the Forecasted Total Inflow to New Bullards Bar (I^{NBB} (TAF)).

Rationale Statement in Support of YCWA's Condition WR3. The North Yuba Index was developed to be used to determine which of the various Yuba Accord instream flow schedules would be applicable at any particular time. These schedules specify the required minimum instream flows in the Yuba River downstream of the Narrows 2 Powerhouse. Implementation of the Yuba Accord flow schedules often requires large quantities of water to be released from storage in New Bullards Bar Reservoir. The relative volume of water required to be released in the drier years can be more than 100 percent of the total of runoff and diversions into New Bullards Bar Reservoir, and averages 77 percent of these inflows into New Bullards Bar Reservoir during the driest one third of years. Therefore, to meet these high demands on reservoir operations, an accurate measure of the water available to meet instream flows is needed. The North Yuba River Index uses the sum of the annual inflow into the reservoir plus active storage in the reservoir. This sum is a measure of the water available to meet instream flows. Other potential indices such as amounts of unimpaired flows do not reflect the effect of water diversions and storage operations in the watershed. In the development of the Yuba Accord, many alternative indices were tested, and none of the other alternatives were able to

provide the high occurrence of high volume instream flow schedules and maintain water supply reliability, as the North Yuba Index does.

The threshold values used in the North Yuba Index were set to assure more frequent occurrences of the higher streamflow schedules. The need for achieving the higher streamflow schedules in more years was established during the development of the Yuba Accord by biologists examining the primary stressors for listed salmonids. The biologists tasked with developing the Yuba Accord flows determined that both flows and temperatures were important during various life stages for salmonids on the lower Yuba River and that the resulting flows achieved with the two highest flow schedules, Schedules 1 and 2, would provide a range of conditions thought to be optimal for the species of concern while preserving the ability to meet local water supply demands. The flow schedules developed for the Accord provided the pattern and quantity of flows to maintain fish in good condition, and the North Yuba Index ensures that the optimal range of flows (as identified by the biologists) will be achieved in most years.

E2.3.4 YCWA's Proposed Condition WR4: Implement Streamflow and Reservoir Level Compliance Monitoring Plan[15, 16]

Licensee shall implement the Streamflow and Reservoir Level Compliance Monitoring Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition WR4. In many cases, compliance with YCWA's proposed streamflows and reservoir levels requires accurate and reliable gaging. Many of the gages are in place and functioning, but may need to be modified. The plan provided in Condition WR4 includes a description of the gages, including equipment, location, maintenance, review of data, and publication of data that YCWA will use to document compliance. In addition, the plan describes how YCWA will maintain and modify gages, as needed, to document compliance with the minimum streamflows proposed by YCWA, which in many cases are higher than streamflow requirements in the existing license. The plan also addresses, in part, Article 8 in FERC's Form L-5 Standard Articles, which states in part:

> The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works.

This plan only addresses streamflow and reservoir gages necessary to monitor compliance with YCWA's proposed streamflows and reservoir levels (see YCWA's Proposed Conditions AR1,

[15] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[16] This condition overlaps in part with Article 8 in FERC's Form-L5 Standard Articles.

AR3 and TE4 regarding streamflow and WR6 regarding reservoir levels). Streamflow gages are used in YCWA's Proposed Conditions GS2, AR2 and RR2, but the gages used in those conditions are the compliance gages, which are adequate for the purposes described in Conditions GS2, AR2 and RR2. No other YCWA-Proposed Conditions rely on streamflow or reservoir level gage information.

E2.3.5 YCWA's Proposed Condition WR5: Maintain New Bullards Bar Reservoir Minimum Pool[17]

Licensee shall make a good faith effort to maintain a minimum pool in New Bullards Bar Reservoir at elevation 1,730 feet, except for drawdowns below this elevation that are necessary to meet the minimum streamflow requirements in this license.

Rationale Statement in Support of YCWA's Condition WR5. The primary purpose of the minimum pool is to ensure sufficient submergence of the New Colgate Powerhouse intake lower intake gate to ensure cold water releases to maintain suitable water temperatures in the Yuba River downstream of Narrows 2 Powerhouse for salmon spawning in the fall. The invert elevation of the lower intake gate used for water withdrawals from New Bullards Bar Reservoir through the penstock to the New Colgate Powerhouse is at 1,620 ft. The opening in the dam is 23 feet high, which results in a crown elevation of 1,643 ft for the intake. With a minimum pool elevation of 1,730 ft, the depth of water to the lower intake gate crown is 87 ft., which provides a measure of isolation from the warmest epilimnion waters in the reservoir.

The temperatures of water withdrawn from the reservoir typically range from 9°C to 11°C. Releases from the New Colgate Powerhouse of water withdrawn from New Bullards Bar Reservoir at these temperatures result in suitable water temperatures in the Yuba River for spawning of salmonids. A very large percentage of the water stored in New Bullards Bar Reservoir is in the hypolimnion, the deeper cold waters.

Modeling of the No Action Alternative shows that, under a repeat of WY 1977 hydrological conditions, New Bullards Bar Reservoir would be drawn down to the minimum pool elevation by mid-October. The modeled temperature profile at that time results in a modeled water temperature range across the tunnel opening from about 11°C at the invert to 13°C at the gate crown. At this elevation range, the water temperature increases about 0.4°C for every 5 ft increase in water column elevation. Just above the tunnel inlet elevation at the 1,663 ft, 20 ft above the tunnel inlet crown, the water temperature rise is the water column is 0.8°C per 5 ft of elevation increase. This change in rate of water temperature rise from the tunnel intake elevation to just above the tunnel intake signifies a transition to the steep part of the thermocline temperature profile.

This examination of the reservoir temperature profile when the reservoir is drawn down to the minimum pool shows that reduction of storage below the minimum pool at this critical time in

[17] The proposed minimum New Bullards Bar Reservoir minimum elevation is the same as in Article 34 in the existing license.

the early fall could result in a substantial increase in release temperatures with relatively small reductions in storage in the reservoir. Figure E2-2 is a graph of the modeled water temperature versus depth in New Bullards Bar Reservoir for several days from September 2, 1977 to January 7, 1978 for the No Action Alternative.

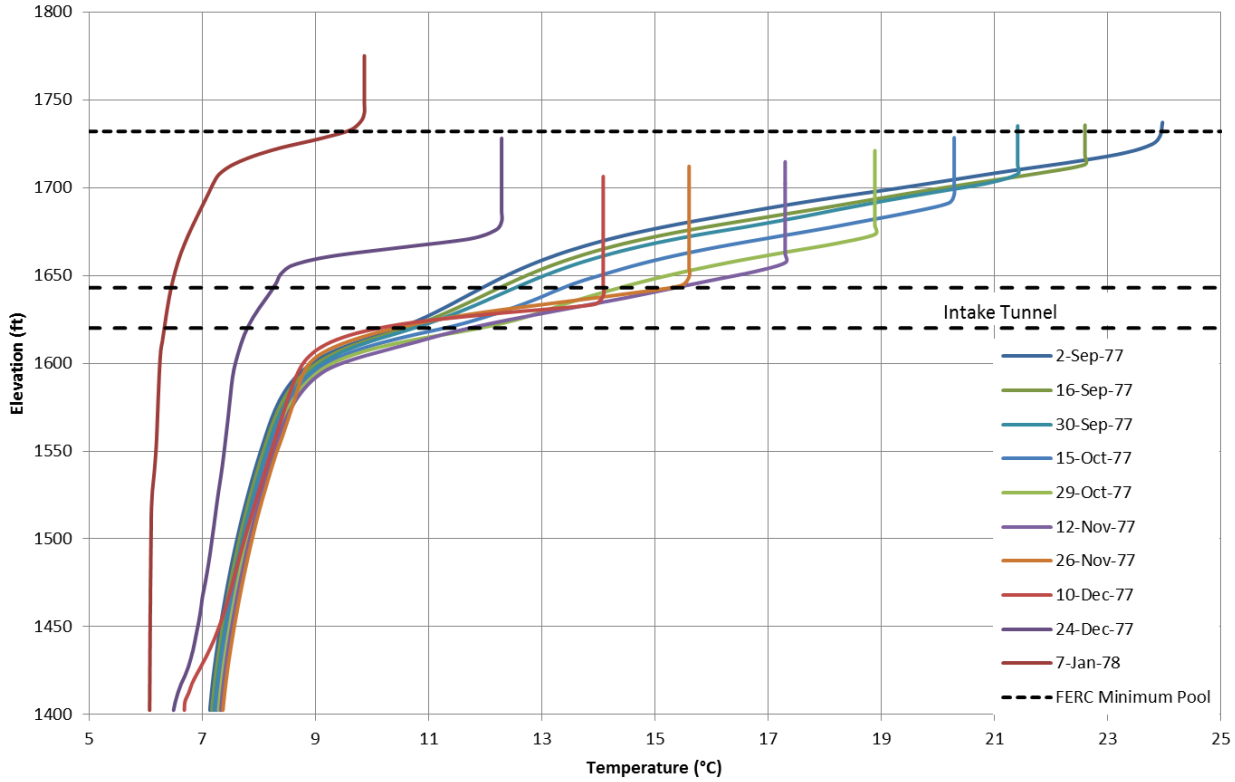

Figure E2-2. Modeled water temperature versus depth in New Bullards Bar Reservoir for several days from September 2, 1977 to January 7, 1978 for the No Action Alternative.

E2.3.6 YCWA's Proposed Condition WR6: Operate New Bullards Bar Reservoir for Flood Control[18]

Licensee shall operate Project reservoirs for flood control in accordance with rules prescribed by the secretary of the Army.

Rationale Statement in Support of YCWA's Condition WR6. The need for flood control on the Yuba River was the primary reason for the creation of YCWA and the construction of New Bullards Bar Dam. Historically, the Marysville-Yuba City area has experienced the ravages of a major flood about once every 10 years. The discharge of debris from placer mines in Nevada County compounded the flooding problems because it raised the Yuba and Feather River beds by many feet. Levees began providing flood control protection for Yuba City and Marysville as

[18] The proposed flood control condition is similar to Article 46 in the existing license.

early as 1875 and are still heavily relied on for flood protection. The USACE contributed $12 million toward construction of New Bullards Bar Dam, under the condition that a maximum of 170,000 ac-ft of flood reservation space be maintained in the reservoir during the peak flooding season.

New Bullards Bar Dam and Reservoir are used to control about one half of the flood flows of the Yuba River watershed, with the remainder of the runoff being largely uncontrolled, as there is no dedicated flood storage on the South Yuba River. The Project provides essential flood management by reducing the peak flood flow and reduces the duration of high water levels on levees on the Yuba River and the Feather River in the Yuba City/Marysville area downstream to the Sacramento River.

During the 1997 flood, the major levee break was on the Feather River on the Yuba County side in the Arboga area, and this break resulted in the flooding of the local residences and the surrounding rural/agricultural areas. During this flood, 1,000 ac of residential land, 15,500 ac of agricultural land and 1,700 ac of industrial lands were flooded, 322 homes were destroyed and 407 homes suffered major damage. The economic cost of this flood was estimated at $300 million. Only 11 years before, in 1986 a massive flood in Linda and Olivehurst, which was the result of a levee break on the Yuba River, flooded more than 3,000 homes and destroyed 895 homes.

Under the Without-Project condition, the estimated peak flow for the 1 in 100 year flood is 260,000 cfs on the Yuba River at Marysville, and would result in approaching the crest of the levee in this area. Under the With-Project condition, the peak flow for this flood event would be 153,000 cfs and be well below the levee crest. Under the Without-Project condition, floods greater than the 1 in 100 unregulated condition would overtop the levee, while the Project reduces the flood peak to below the levee top for floods even larger than the 1 in 200 year event.

The reduction in flood flows by the Project primarily protects the areas of Marysville, Yuba City and reclamation District 784. The value of structures and contents in the Yuba City and Reclamation District 784, which includes the communities of Linda and Olivehurst, total more than $8.5 billion and have a combined population of about 110,000.

E2.4 Aquatic Resources

E2.4.1 YCWA's Proposed Condition AR1: Maintain Minimum Streamflows Downstream of Our House Diversion Dam, Log Cabin Diversion Dam, and New Bullards Bar Dam

Licensee shall meet the minimum streamflow requirements for the Middle Yuba River downstream of Our House Diversion Dam, for Oregon Creek downstream of Log Cabin Diversion Dam and for the North Yuba River downstream of New Bullards Bar Dam that are shown in Table 1 of this condition. Licensee shall record streamflow at all of the gages listed in this table, as required by USGS (Article 8 of FERC's Form L-5, Standard Articles).

Minimum streamflows shall be measured in cubic feet per second (cfs) once every 15-minute.

Minimum streamflows may be temporarily modified as follows:

- For short periods and upon consultation with and approval by the Forest Service, USFWS, Cal Fish and Wildlife and SWRCB. Licensee shall provide notification to the Commission prior to implementing such modifications.
- Due to an emergency. An emergency is defined as an outage due to an event that is reasonably out of the control of Licensee and requires Licensee to take immediate action, either unilaterally or under instruction of law enforcement, emergency services, California ISO or other regulatory agency staff, including actions to prevent the imminent loss of human life or damage to property. An emergency may include, but is not limited to: natural events such as landslides, storms, or wildfires; vandalism; malfunction or failure of PG&E Transmission lines or Project works; or other public safety incidents. If Licensee temporarily modifies the requirements of this condition, Licensee shall make all reasonable efforts to promptly resume performance of the requirements, and shall notify the Forest Service, USFWS, Cal Fish and Wildlife and the SWRCB within 48 hours of the start of the modification. Licensee shall provide notification to the Commission as soon as possible but no later than 10 days after such incident.

Except as otherwise provided, Licensee shall implement the minimum streamflows shown in Tables 1 of this condition beginning in the first 90 days of the new license term unless a facility modification or construction is necessary. Changes between minimum streamflow values may be made with one adjustment to the controlling valve (i.e., ramping from one minimum flow to another minimum flow is not required).

Where a facility must be modified or constructed to allow compliance with the required minimum streamflows, including flow measurement facilities, then, except as otherwise provided, Licensee shall submit applications for permits to modify or construct the facility as soon as reasonably practicable but no later than within the first 2 years of the new license term, and Licensee will complete the work as soon as reasonably practicable but no later than within 2 years after receiving all required permits and approvals for the work. During the period before

facility modifications or construction are completed, and within the first 90 days of the new license term, Licensee shall make a good faith effort to provide the specified minimum streamflows within the reasonable capabilities of the existing facilities.

Table 1. Minimum Streamflows in cubic feet per second (cfs) for the Yuba River Development Project by month and Water Year Type, which is defined in Licensee's proposed Condition WR2.

Month	Wet Water Year	Above Normal Water Year	Below Normal Water Year	Dry Water Year	Critically Dry Water Year	Extreme Critically Dry Water Year
MIDDLE YUBA RIVER - BELOW OUR HOUSE DIVERSION DAM (COMPLIANCE POINT: USGS STREAMFLOW GAGE 11408880)						
October 1 - 30	57*	57*	57*	49*	35*	21*
November 1-30	57*	57*	57*	49*	35*	21*
December 1 - 31	57*	57*	57*	49*	35*	21*
January 1 - 31	57*	57*	57*	49*	35*	21*
February 1- 29	57*	57*	57*	49*	35*	21*
March 1 - 31	80*	66*	57*	49*	35*	21*
April 1 - 30	80*	66*	57*	49*	35*	21*
May 1- 31	80*	66*	57*	49*	35*	21*
June 1 - 30	80*	66*	57*	49*	35*	21*
July 1 - 31	80*	66*	57*	49*	35*	21*
August 1 - 31	80*	66*	57*	49*	35*	21*
September 1- 30	80*	66*	57*	49*	35*	21*
OREGON CREEK - BELOW LOG CABIN DIVERSION DAM (COMPLIANCE POINT: USGS STREAMFLOW GAGE 11409400)						
October 1 - 30	8*	8*	8*	6*	6*	6*
November 1-30	8*	8*	8*	6*	6*	6*
December 1 - 31	8*	8*	8*	6*	6*	6*
January 1 - 31	8*	8*	8*	6*	6*	6*
February 1- 29	8*	8*	8*	6*	6*	6*
March 1 - 31	13*	10*	8*	6*	6*	6*
April 1 - 30	31*	26*	21*	18*	12*	6*
May 1- 31	31*	26*	21*	18*	12*	6*
June 1 - 30	31*	26*	21*	18*	12*	6*
July 1 - 31	13*	10*	8*	6*	6*	6*
August 1 - 31	13*	10*	8*	6*	6*	6*
September 1- 30	13*	10*	8*	6*	6*	6*
NORTH YUBA RIVER - BELOW NEW BULLARDS BAR DAM (COMPLIANCE POINT: USGS STREAMFLOW GAGE 11413517)						
October 1 - 30	13	13	13	13	7	5
November 1-30	13	13	13	13	7	5
December 1 - 31	13	13	13	13	7	5
January 1 - 31	13	13	13	13	7	5
February 1- 29	13	13	13	13	7	5
March 1 - 31	11	12	13	13	7	5
April 1 - 30	5	5	5	5	5	5
May 1- 31	5	5	5	5	5	5
June 1 - 30	5	5	5	5	5	5
July 1 - 31	11	12	13	13	7	5
August 1 - 31	11	12	13	13	7	5
September 1–- 30	11	12	13	13	7	5

* Or natural inflow if natural inflow is less.

Minimum flow releases are not required from the New Colgate Powerhouse.

Rationale Statement in Support of YCWA's Condition AR1. YCWA followed a step-wise process to develop proposed minimum flow releases from Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam. The process focused primarily on providing habitat for rainbow trout. The approach used by YCWA in each reach below each dam is described below.

Oregon Creek - Log Cabin Diversion Dam Reach

As background, the flow releases from the Log Cabin Diversion Dam directly affect the 4.1-mi section of Oregon Creek from the Log Cabin Diversion Dam to Oregon Creek's confluence with the Middle Yuba River (i.e., Log Cabin Diversion Dam Reach). The overall gradient in the reach is 2.3 percent, with a maximum gradient of 4.8 percent between RM 0.5 and RM 1.2. There is a low gradient section (i.e., 0.7%) on private land near the center of the reach at Celestial Valley. In the 4 miles of the reach that had on-the-ground habitat mapping done, there was 255 square feet (sq ft) of gravel that is the size appropriate for trout spawning (i.e., assumed to have a D_{50} of 20 millimeters (mm)). YCWA estimated this size gravel becomes mobile in the reach at a flow of 281 cfs, which has a return interval of 1.1 years under Without-Project conditions and 1.5 years under With-Project conditions

YCWA's 2012 stream fish surveys found three fishes in Oregon Creek at the one site surveyed by electrofishing: RM 0.3 just upstream of the Middle Yuba River. YCWA found 2,266 rainbow trout (i.e., 23.9 lbs/ac), 169 Sacramento sucker, and 24 smallmouth bass per mile. Rainbow trout ranged in size from 56 to 121 mm, representing young-of-the-year (YOY) to 1+ age classes.

YCWA's fry emergence investigation suggested that rainbow trout spawning occurs from April through June in this reach.

YCWA developed two sets of flow versus WUA curves for rainbow trout adult and spawning life stages: one for the Log Cabin Diversion Dam sub-reach (Log Cabin Diversion Dam to Celestial Valley/Celestial Valley to Middle Yuba River [i.e., higher gradient sections of reach]), and one for the Celestial Valley sub-reach (i.e., lower gradient section of reach). The curves are very similar, so the static WUA results from the Log Cabin Diversion Dam sub-reach (i.e., the higher gradient), which are slightly higher, were used in YCWA's stepwise process. The 100 and 80 percent of maximum static WUA for the rainbow trout adult life stage were 25 and 6 cfs, respectively; the 100 and 80 percent of maximum static WUA for the rainbow trout spawning life stage were 55 cfs and 18 cfs, respectively; and the 100 and 80 percent of maximum static WUA for the rainbow trout juvenile life stage were 17 and 5 cfs, respectively.

YCWA's 2008 through 2012 water temperature monitoring in the reach occurred at two locations: RM 4.0 immediately below Log Cabin Diversion Dam from July 2008 through October 2012, and RM 0.1 immediately upstream of the Middle Yuba River confluence from March 2011 through October 2012. Although existing minimum flow releases are usually inflow equal to outflow from July through October, at RM 4.0, YCWA found that the mean and maximum daily water temperatures in July were 20.1°C and 23.0°C, respectively; and mean and maximum daily water temperatures in August were 19.7°C and 21.8°C, respectively. At RM

0.1, YCWA found that the mean and maximum daily water temperatures in July were 18.6°C and 20.6°C, respectively; and mean and maximum daily water temperatures in August were 18.5°C and 20.9°C, respectively. At RM 4.0 in July and August, mean daily water temperature exceeded 20°C 64 and 33 percent of the time, respectively. At RM 0.1, mean daily water temperature exceeded 20°C in July and August 6 percent and 10 percent of the time, respectively.

No egg masses, but 5 tadpoles, 1 juvenile and 4 adult FYLF were found in the reach during YCWA's visual encounter surveys (VES) at four sites in 2012. In 2011, water temperature reached 10°C, the temperature at which FYLF begin egg laying, by about June 10.

Existing minimum flow releases are usually inflow equal to outflow from July through October. Without-Project modeled mean monthly flows[19] in these four months were 7, 3, 3, and 6 cfs, respectively. The highest Without-Project modeled mean monthly flow is in March (199 cfs).

YCWA's step-wise process targeted the rainbow trout adult life stage except for April through June, where the rainbow trout spawning life stage was targeted. This was done because the flow at which the maximum amount of habitat for spawning occurs (i.e., 55 cfs) is higher than the flow at which the maximum amount of habitat for adult occurs (i.e., 25 cfs). YCWA did not target the rainbow trout juvenile life stage because the flow at which the maximum amount of habitat for juveniles occurs (i.e., 17 cfs) is less than that for both spawning and adults, so setting flows for adults and spawning was assumed to enhance habitat for the juvenile life stage.
YCWA first populated a flow matrix by inserting the following numbers:

- Wet WYs – 100 percent of the maximum static WUA flows, which resulted in 25 cfs in the adult months and 55 cfs in the spawning months
- Above Normal WYs – 90 percent of the maximum static WUA flows, which resulted in 10 cfs in the adult months and 26 cfs in the spawning months
- Below Normal WYs – 85 percent of the maximum static WUA flows, which resulted in 8 cfs in the adult months and 21 cfs in the spawning months
- Dry WYs – 79 percent of the maximum static WUA flows, which resulted in 6 cfs in the adult months and 18 cfs in the spawning months
- Critically Dry WYs – 64 percent of the maximum static WUA flows, which resulted in 3 cfs in the adult months and 12 cfs in the spawning months
- Extreme Critically Dry WYs – the lowest minimum flow release in existing license in any month (6 cfs), which yielded 79 percent of maximum WUA for adult and 39 percent of maximum WUA for spawning.

[19] These are modeled flows in the relicensing Operations Model for the period from WY 1970 through WY 2010.

YCWA then reviewed the rainbow trout adult and spawning WUA curves with Wet WYs in mind. YCWA found that in the Wet WYs, a minimum flow release of 13 cfs provides 95 percent of the static WUA for adults. Since this was a reduction of 12 cfs (50%) from the maximum of 25 cfs with only a 5 percent reduction in habitat, YCWA made the flows from July through March of Wet WY months 13 cfs. Similarly, for spawning, YCWA found that in the Wet WYs, 32 cfs provided 95 percent of the static WUA for spawning. Since this was a reduction of 27 cfs (49%) from the maximum of 55 cfs with only a 5 percent reduction in habitat, YCWA made the flows from April through May of Wet WY months 32 cfs. YCWA performed the same analysis for the other WYs, but found that any significant reduction in flow from the initial flow numbers also significantly reduced habitat from the target, so flows in those WRs were not modified in this step.

Then, as stated above, since no one knows with reliability in fall what type of WY will occur, YCWA changed the flows from October through February of the Wet and Above Normal WYs to the Below Normal WY flow of 8 cfs. In that way, each WY starts in October assuming the year will be slightly less than normal until there is a good indication of the WY type in March.

YCWA then checked all the numbers and if any numbers were below the lowest minimum flow in the existing license (5.6, rounded up to 6 cfs), YCWA changed those numbers to be the same as the lowest minimum flow in the existing license. This resulted in changing the 3 cfs in Critically Dry WYs to 6 cfs.

Last, since inflow into Log Cabin Diversion Dam is often less than the minimum flow and the dam does not have storage, YCWA modified the table to say *"Or, natural inflow if natural inflow is less."*

The resulting minimum flow releases based on the above step-wise process are shown in Table ES-3 of Condition AR1. Table E2-3 shows the percent of maximum WUA in the Log Cabin Diversion Dam Reach for each of the flows for rainbow trout adult, spawning and juvenile life stages.

Table E2-3. Percent of maximum WUA for rainbow trout adult, spawning and juvenile life stages in the Log Cabin Diversion Dam Reach that correspond with the Log Cabin Diversion Dam flows shown in YCWA's proposed Condition AR1.

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
RAINBOW TROUT – ADULT LIFE STAGE						
October	79%	79%	79%	85%	85%	85%
November	79%	79%	79%	85%	85%	85%
December	79%	79%	79%	85%	85%	85%
January	79%	79%	79%	85%	85%	85%
February	79%	79%	79%	85%	85%	85%
March	79%	79%	79%	85%	90%	95%
April	79%	94%	99%	99%	100%	100%
May	79%	94%	99%	99%	100%	100%
June	79%	94%	99%	99%	100%	100%
July	79%	79%	79%	85%	90%	95%
August	79%	79%	79%	85%	90%	95%
September	79%	79%	79%	85%	90%	95%

Table E2-3. (continued)

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
RAINBOW TROUT – SPAWNING LIFE STAGE						
April	39%	64%	79%	84%	90%	95%
May	39%	64%	79%	84%	90%	95%
June	39%	64%	79%	84%	90%	95%
RAINBOW TROUT – JUVENILE LIFE STAGE						
October	89%	89%	89%	94%	94%	94%
November	89%	89%	89%	94%	94%	94%
December	89%	89%	89%	94%	94%	94%
January	89%	89%	89%	94%	94%	94%
February	89%	89%	89%	94%	94%	94%
March	89%	89%	89%	94%	97%	99%
April	89%	99%	100%	99%	98%	96%
May	89%	99%	100%	99%	98%	96%
June	89%	99%	100%	99%	98%	96%
July	89%	89%	89%	94%	97%	99%
August	89%	89%	89%	94%	97%	99%
September	89%	89%	89%	94%	97%	99%

To evaluate the streamflow results shown in Table 1 of Condition AR1 on rainbow trout habitat over time (as compared to using the static WUA in Table E-3), YCWA used the Habitat Duration Analysis (HDA) described in Technical Memorandum 3-10, *Instream Flow Upstream of Englebright Reservoir*. YCWA calculated the amount of habitat for rainbow trout adult, juvenile and spawning life stages that would be achieved under YCWA's proposed minimum streamflows as compared to the No Action Alternative. Table E2-4 provides a summary comparison metric (i.e., Area Under the Curve, or AUC). The table compares, for all WYs, the monthly average habitat that would occur under the proposed minimum streamflow releases to monthly average habitat that would occur under No Action Alternative at each hydrologic model Node where Node 0 represents the hydrologic conditions at the dam (i.e., no accretion) and Node 1 represents the hydrologic mid point of the stream reach upstream of Celestial Valley (RM 3.1 to RM 4.3), Node 2 represents the Celestial Valley sub-reach (RM 2.0 to RM 3.1) and Node 3 represents the reach from the confluence of the Middle Yuba River to Celestial Valley (RM 0.0 to RM 2.0).

Table E2-4. Percent of habitat AUC that corresponds with YCWA's proposed Condition AR1 for rainbow trout adult, juvenile and spawning life stages as compared to the No Action Alternative in Oregon Creek. Comparison made using all WYs in the period of record (WY 1970 through 2010).

Rainbow Trout Life Stage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
OREGON CREEK - NODE 0 - ALL WATER YEARS – SUM OF AUC 1% TO 100%												
Adult	83.0%	90.3%	96.6%	98.2%	98.3%	101.6%	107.4%	104.3%	106.4%	88.7%	72.5%	71.5%
Juvenile	84.6%	91.9%	97.6%	98.8%	98.9%	100.9%	100.6%	98.9%	99.7%	89.4%	74.7%	73.2%
Spawning	--	--	--	--	--	--	138.2%	126.8%	137.9%	--	--	--
OREGON CREEK - NODE 1 - ALL WATER YEARS – SUM OF AUC 1% TO 100%												
Adult	83.7%	90.8%	96.9%	98.5%	98.8%	100.8%	103.8%	102.7%	105.5%	89.1%	73.4%	72.4%
Juvenile	85.3%	92.4%	97.8%	99.2%	99.4%	100.2%	98.3%	97.9%	99.1%	89.8%	75.6%	74.2%
Spawning	--	--	--	--	--	--	125.9%	121.0%	134.4%	--	--	--
OREGON CREEK - NODE 2 - ALL WATER YEARS – SUM OF AUC 1% TO 100%												
Adult	81.6%	89.8%	97.0%	99.1%	99.6%	99.8%	95.1%	96.2%	98.7%	87.4%	70.9%	70.0%
Juvenile	83.3%	91.4%	97.8%	99.6%	100.0%	99.4%	90.7%	92.3%	94.2%	88.3%	73.1%	71.6%
Spawning	--	--	--	--	--	--	107.8%	108.5%	121.8%	--	--	--

Table E2-4. (continued)

Rainbow Trout Life Stage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
OREGON CREEK - NODE 3 - ALL WATER YEARS – SUM OF AUC 1% TO 100%												
Adult	87.0%	92.8%	97.8%	99.4%	99.7%	99.9%	98.8%	99.7%	102.4%	90.9%	77.9%	77.0%
Juvenile	88.8%	94.4%	98.5%	99.7%	100.0%	99.7%	96.0%	96.6%	97.4%	91.8%	80.4%	79.0%
Spawning	--	--	--	--	--	--	106.1%	108.6%	122.3%	--	--	--

YCWA's proposed Project releases at Log Cabin Diversion Dam that targeted rainbow trout adult and spawning life stages resulted in increases in habitat for spawning and both increases and decreases in habitat for the juvenile and adult life stages. For example, rainbow trout spawning habitat for April through June increased at all hydrologic node locations. For the same time period, rainbow trout adult habitat increased slightly at the upper two hydrologic nodes, while the habitat decreased slightly at the two lower nodes due to the combined increased minimum releases and accretion which resulted in higher than ideal streamflows. Similarly, rainbow trout juvenile habitat was reduced slightly in the spring months as ideal streamflow conditions for juveniles were exceeded.

Habitat reductions for all species and life stages are observed from July through January as compared to the No Action Alternative. The reduction is due to increased releases from Our House Diversion Dam on the Middle Yuba River, which in turn resulted in less water conveyed through Lohman Ridge Diversion tunnel. The reduction in tunnel flow reduces water availability for minimum flow augmentation in Oregon Creek during the summer, fall and winter months, when the minimum flow requirement is basically inflow equals outflow.

Proposed minimum flows on Oregon Creek downstream of Log Cabin Diversion Dam are higher than previous minimum flows and are primarily designed as beneficial to resident fish. These proposed minimum flows provide nearly as much suitable habitat for FYLF as occurs at lower base flows, but reduce the amplitude of flow changes associated with small spills. Because the proposed minimum flows provide substantial suitable habitat for FYLF breeding and rearing, and will not affect water temperatures, overall effects to FYLF will be beneficial or neutral.

Middle Yuba River - Our House Diversion Dam Reach

As background, the flow releases from the Our House Diversion Dam directly affect the 7.9-mi section of the Middle Yuba River from Our House Diversion Dam to the confluence with Oregon Creek (i.e., Our House Diversion Dam Reach). The overall gradient in the reach is 1.2 percent, with a maximum gradient of 2.5 percent in the lower 1 mile of the river and just below Our House Diversion Dam. In the 2.9 miles of the reach that had on-the-ground habitat mapping done, there was 2,311 sq ft of trout spawning-sized gravel. YCWA estimated this size gravel becomes mobile in the reach at a flow of 42 to 97 cfs, which have a return interval of less than 1 year under Without-Project conditions and 1.0 to 1.1 years under With-Project conditions.

YCWA's 2012 stream fish surveys found three fishes in the reach by snorkeling at RM 11.7 just below the dam and electrofishing at RM 5.0 just above the Oregon Creek confluence. At RM 11.7, YCWA found 453 rainbow trout and 88 smallmouth bass per mile; and at RM 5.0, YCWA

found 1,915 smallmouth bass, 155 rainbow trout (i.e., 4 lbs/ac), and 141 Sacramento sucker per mile. Rainbow trout ranged in size from 51 to 357 mm, representing YOY to 2+ age classes.

YCWA's fry emergence investigation suggested that rainbow trout spawning occurs from April through June in this reach.

YCWA developed one set of WUA curves for the entire reach. The 100 and 80 percent of maximum static WUA for the rainbow trout adult life stage were 120 and 49 cfs, respectively; the 100 and 80 percent of maximum static WUA for the rainbow trout spawning life stage were 90 cfs and 32 cfs, respectively; and the 100 and 80 percent of maximum static WUA for the rainbow trout juvenile life stage were 50 cfs and 19 cfs, respectively.

YCWA's 2008 through 2012 water temperature monitoring occurred at one location in this reach: RM 12.0 immediately below Our House Diversion Dam from October 2008 through October 2012. YCWA found that the mean and maximum daily water temperatures in July were 20.7°C and 24.6°C in July, respectively, and the mean and maximum daily water temperatures in August were 21.3°C and 24.3°C, respectively. Mean daily water temperature were greater than 20°C about 70 percent of the time in July and 80 percent of the time in August during the monitoring period. However, existing minimum flow releases from July through October are usually inflow equal to outflow; there is no water available to increase the minimum flow requirement. These water temperatures support YCWA's stream fish sampling findings that the reach supports a transitional, not coldwater, fishery.

No egg masses, but about 100 tadpole, 32 juvenile and 27 adult FYLF were found in the reach during YCWA's VES at four sites in 2012. In 2008, 2009, 2010 and 2011, water temperature reached 10°C, the lowest temperature at which FYLF begin egg laying, between early April and mid June.

Existing minimum flow releases from July through October are usually inflow equal to outflow. Without-Project modeled monthly mean flows in these four months are 94, 42, 37 and 47 cfs, respectively. The highest Without-Project modeled mean monthly flow is 626 cfs in May.

YCWA's step-wise approach for developing fish release flows from Our House Diversion Dam focused on the rainbow trout adult life stage because the flow at which the maximum amount of habitat for adults which occurs in the reach (i.e., 120 cfs) is higher than the flow at which the maximum amount of habitat for the spawning and juvenile life stages occur (i.e., 90 and 50, respectively).

In the first step, YCWA populated a flow matrix by inserting the following numbers:

- Wet WYs – 100 percent of the maximum static WUA flow for rainbow trout adult, which resulted in 120 cfs
- Above Normal WYs – 90 percent of the maximum static WUA flow, which resulted in 66 cfs

- Below Normal WYs – 85 percent of the maximum static WUA flow, which resulted in 57 cfs
- Dry WYs – 80 percent of the maximum static WUA flow, which resulted in 49 cfs
- Critically Dry WYs – 65 percent of the maximum static WUA flow, which resulted in 35 cfs
- Extreme Critically Dry WYs – the lowest minimum flow release in existing license in any month (21 cfs), which yielded 44 percent of maximum WUA for rainbow trout adult.

YCWA then reviewed the rainbow trout adult WUA curve with Wet WYs in mind. YCWA found that in the Wet WYs, 80 cfs provided 95 percent of the maximum static WUA for adults. Since, for adults, this was a reduction of 40 cfs (33%) from the maximum of 120 cfs with only a 5 percent reduction in habitat, YCWA made the flows in all Wet WY months 80 cfs.

The same analysis was performed for the other WYs, but YCWA found that any significant reduction in flow from the initial flow numbers also significantly reduced habitat from the target, so the other WYs were not modified.

Then, since no one knows with reliability in fall what type of WY will occur, from October through February of the Wet and Above Normal WYs, YCWA changed the number to use the Below Normal WY flow (57 cfs).

YCWA then checked all the numbers to be sure none were lower than the lowest minimum flow in the existing license (21 cfs). None were.

Last, since inflow to Our House Diversion is often less than the minimum flow releases and the dam does not have storage, YCWA modified the table to say "*Or natural inflow if natural inflow is less.*"

The resulting minimum flow releases based on the above step-wise process are shown in Table ES-5 of Condition AR1. Table E2-5 shows the percent of maximum WUA in the Our House Diversion Dam Reach for each of the flows for rainbow trout adult, spawning and juvenile life stages.

Table E2-5. Percent of maximum WUA for rainbow trout adult, spawning and juvenile life stages in the Our House Diversion Dam Reach that correspond with YCWA's proposed Condition AR1.

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
RAINBOW TROUT – ADULT LIFE STAGE						
October	44%	65%	80%	85%	85%	85%
November	44%	65%	80%	85%	85%	85%
December	44%	65%	80%	85%	85%	85%
January	44%	65%	80%	85%	85%	85%
February	44%	65%	80%	85%	85%	85%
March	44%	65%	80%	85%	90%	95%
April	44%	65%	80%	85%	90%	95%
May	44%	65%	80%	85%	90%	95%

Table E2-5. (continued)

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
RAINBOW TROUT – ADULT LIFE STAGE (continued)						
June	44%	65%	80%	85%	90%	95%
July	44%	65%	80%	85%	90%	95%
August	44%	65%	80%	85%	90%	95%
September	44%	65%	80%	85%	90%	95%
RAINBOW TROUT – SPAWNING LIFE STAGE						
April	67%	82%	89%	92%	95%	99%
May	67%	82%	89%	92%	95%	99%
June	67%	82%	89%	92%	95%	99%
RAINBOW TROUT – JUVENILE LIFE STAGE						
October	88%	98%	100%	99%	99%	99%
November	88%	98%	100%	99%	99%	99%
December	88%	98%	100%	99%	99%	99%
January	88%	98%	100%	99%	99%	99%
February	88%	98%	100%	99%	99%	99%
March	88%	98%	100%	99%	98%	95%
April	88%	98%	100%	99%	98%	95%
May	88%	98%	100%	99%	98%	95%
June	88%	98%	100%	99%	98%	95%
July	88%	98%	100%	99%	98%	95%
August	88%	98%	100%	99%	98%	95%
September	88%	98%	100%	99%	98%	95%

Table E2-6 provides habitat over time in the Our House Diversion Dam Reach.

Table E2-6. Percent of habitat AUC that corresponds with YCWA's proposed Condition AR1 for rainbow trout adult, juvenile and spawning life stages as compared to the No Action Alternative in the Our House Diversion Dam Reach of the Middle Yuba River. Comparison made using all WY in the period of record (WY 1970 through 2010).

Rainbow Trout Life Stage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
MIDDLE YUBA RIVER - NODE 0 - ALL WATER YEARS - SUM OF AUC 1% to 100%												
Adult	113.7%	121.9%	127.7%	128.2%	128.6%	132.8%	115.0%	101.7%	116.5%	130.2%	117.0%	110.4%
Juvenile	100.9%	101.0%	100.9%	100.9%	100.8%	99.4%	99.1%	95.8%	95.8%	99.2%	100.7%	100.7%
Spawning	--	--	--	--	--	--	107.3%	99.6%	105.9%	--	--	--
MIDDLE YUBA RIVER - NODE 1 - ALL WATER YEARS - SUM OF AUC 1% to 100%												
Adult	112.4%	116.6%	116.9%	112.9%	109.5%	107.8%	104.0%	99.2%	112.2%	126.9%	116.2%	109.8%
Juvenile	100.5%	99.8%	98.6%	97.6%	96.7%	94.5%	96.7%	96.0%	95.1%	98.5%	100.5%	100.6%
Spawning	--	--	--	--	--	--	101.4%	98.0%	104.1%	--	--	--

Proposed Project releases at Our House Diversion Dam which targeted rainbow trout adult and spawning life stages, resulted in both increases and decreases in habitat for all rainbow trout life stages. While some habitat reductions were observed, significant improvements were made to the adult life stage. Habitat for rainbow trout adult and spawning life stages increased in all months except May when average monthly streamflows in May exceed ideal discharge values associated with optimal WUA. Similarly, results for juvenile rainbow trout indicate slight reductions in habitat as compared to the No Action Alternative, primarily due to increased streamflows which exceed ideal discharges associated with optimal juvenile WUA. The effect of accretion on habitat for all species and life stages observed between Node 0 and Node 1 is expressed by the

overall reduction in the percent change in habitat between the No Action Alternative and proposed Project.

Proposed minimum flows on the Middle Yuba River downstream of Our House Diversion Dam under Condition AR1 are higher than previous minimum flows and are primarily designed as beneficial to resident fish. These higher minimum flows provide nearly as much suitable habitat for FYLF as occurs at lower base flows, but reduce the amplitude of flow changes associated with small spills. Because the proposed minimum flows provide substantial suitable habitat for FYLF breeding and rearing and will not affect water temperatures, overall effects to FYLF will be beneficial or neutral.

Middle Yuba River - Oregon Creek Reach

The combined releases from Our House and Log Cabin diversion dams indirectly affect the 4.7-mi section of the Middle Yuba River from Oregon Creek to the Middle Yuba River's confluence with the North Yuba River (i.e., Oregon Creek Reach). However, existing minimum flow releases from both locations in July through October are usually inflow equal to outflow. The overall gradient in the reach is 1.3 percent. In the 1.3 miles of the reach that had on-the-ground habitat mapping done, there was 881 square feet of gravel that is trout spawning size. YCWA estimated this size gravel becomes mobile at a flow of 255 cfs, which has a return interval of less than 1 year under Without-Project conditions and 1 year under With-Project conditions.

YCWA's 2012 stream fish surveys found four fishes in the Middle Yuba River in the Oregon Creek Reach at the two sites surveyed: snorkeling at RM 3.3 near Moonshine Creek and electrofishing and snorkeling at RM 1.0 near Yellowjacket Creek. At RM 3.3, YCWA found 613 rainbow trout, 126 smallmouth bass, and 91 Sacramento sucker per mile. At the snorkeling site at RM 1.0, YCWA found 1,922 smallmouth bass and 633 rainbow trout per mile; while at the electrofishing site at RM 1.0, YCWA found 520 smallmouth bass, 470 rainbow trout (4.3 lbs/ac) and 40 Sacramento pikeminnow (*Ptychocheilus grandis*) per mile. Rainbow trout ranged in size from 50 to 337 mm, representing YOY to 2+ age classes.

YCWA developed one set of WUA curves for the entire reach. The 100 and 80 percent of maximum static WUA for the rainbow trout adult life stage were 132 and 55 cfs, respectively; and the 100 and 80 percent of maximum static WUA for the rainbow trout spawning life stage were 345 cfs and 216 cfs, respectively; and the 100 and 80 percent of maximum static WUA for the rainbow trout juvenile life stage were 45 cfs and 14 cfs, respectively.

YCWA's 2008 through 2012 water temperature monitoring occurred at one location in this reach: RM 0.0 immediately upstream of the confluence with the North Yuba River. YCWA found that the mean and maximum daily average water temperatures in July were 23.1°C and 26.0°C, respectively; and mean and maximum daily water temperatures in August were 22.3°C and 25.5°C, respectively. In July and August, mean daily water temperatures were greater than 20°C 98 percent and 96 percent of days respectively, but existing minimum flow releases from both upstream diversions in July through October are usually inflow equal to outflow. Similar statistics for modeled water temperature data over the entire 40-year period of record at this site (RM 0.0) and at a site just downstream of Oregon Creek are available on the Minimum Flow

Matrix tool on the Relicensing Website. These water temperatures support YCWA's stream fish sampling findings that the reach supports a transitional, not cold water, fishery.

One juvenile FYLF and one egg mass were found in the reach during YCWA's VES at three sites in 2012. An adult FYLF was noted incidentally within one of these sites in August 2012, when six juvenile FYLF were also incidentally observed within the reach at another location.

The existing license does not include minimum streamflow requirements in this reach. Without-Project modeled monthly mean flows from July through October in this reach are 106, 48, 42 and 57 cfs, respectively. The highest Without-Project modeled mean monthly flow is 958 cfs in March.

Table E2-7 shows the percent of maximum WUA in the Oregon Creek Reach for rainbow trout adult, spawning and juvenile life stages using the sum of the minimum flow releases from Our House and Log Cabin diversion dams shown in Table 1.

Table E2-7. Percent of maximum WUA for rainbow trout adult, spawning and juvenile life stages in the Oregon Creek Reach that correspond with YCWA's proposed Condition AR1.

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
RAINBOW TROUT – ADULT LIFE STAGE						
October	49%	68%	80%	87%	87%	87%
November	49%	68%	80%	87%	87%	87%
December	49%	68%	80%	87%	87%	87%
January	49%	68%	80%	87%	87%	87%
February	49%	68%	80%	87%	87%	87%
March	49%	68%	80%	87%	92%	97%
April	49%	74%	88%	93%	97%	99%
May	49%	74%	88%	93%	97%	99%
June	49%	74%	88%	93%	97%	99%
July	49%	68%	80%	87%	92%	97%
August	49%	68%	80%	87%	92%	97%
September	49%	68%	80%	87%	92%	97%
RAINBOW TROUT – SPAWNING LIFE STAGE						
April	11%	19%	27%	31%	37%	45%
May	11%	19%	27%	31%	37%	45%
June	11%	19%	27%	31%	37%	45%
RAINBOW TROUT – JUVENILE LIFE STAGE						
October	94%	99%	100%	99%	99%	99%
November	94%	99%	100%	99%	99%	99%
December	94%	99%	100%	99%	99%	99%
January	94%	99%	100%	99%	99%	99%
February	94%	99%	100%	99%	99%	99%
March	94%	99%	100%	99%	97%	92%
April	94%	100%	98%	96%	93%	89%
May	94%	100%	98%	96%	93%	89%
June	94%	100%	98%	96%	93%	89%
July	94%	99%	100%	99%	97%	92%
August	94%	99%	100%	99%	97%	92%
September	94%	99%	100%	99%	97%	92%

Table E2-8 provides habitat over time in the Oregon Creek Reach.

Table E2-8. Percent of habitat AUC that corresponds with YCWA's proposed Condition AR1 for rainbow trout adult, juvenile and spawning life stages as compared to the No Action Alternative in the Oregon Creek Reach of the Middle Yuba River. Comparison made using all WYs in the period of record (WYs 1970 through 2010).

Rainbow Trout Life Stage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
MIDDLE YUBA RIVER - NODE 2 - ALL WATER YEARS - SUM OF AUC 1% to 100%												
Adult	108.1%	109.0%	107.6%	104.1%	101.3%	99.0%	99.1%	97.7%	105.0%	116.6%	111.4%	107.0%
Juvenile	99.3%	98.2%	97.0%	96.5%	96.6%	95.9%	97.6%	97.5%	94.4%	96.1%	99.1%	99.7%
Spawning	--	--	--	--	--	--	108.0%	107.1%	134.2%	--	--	--

The combined effect of proposed Project releases at Our House and Log Cabin Diversion Dams in addition to watershed accretion, resulted in both increases and decreases rainbow trout habitat. For example, considerable increases in rainbow trout spawning habitat were observed April through June. Rainbow trout adult habitat increased considerably in most months, but ideal streamflow conditions were exceeded due to increased runoff in March, April and May. However, late summer water temperatures remain problematic, while upstream diversions are usually releasing all available inflow. Similarly, HDA results for juvenile rainbow trout indicate slight or negligible reductions in habitat as compared to the No Action Alternative, primarily a result of increased streamflows which exceed ideal discharges associated with optimal WUA.

FYLF in the reach may be affected by minimum flow schedules and changes in flows associated with spills originating at Our House Diversion Dam. As described above, spills at Log Cabin Diversion Dam rarely occur during periods when FYLF breeding or tadpole rearing could be affected. YCWA recorded few detections of FYLF from surveys or incidental observations downstream of the confluence of Oregon Creek. There was evidence of breeding just downstream of Oregon Creek (i.e., one FYLF egg mass detected in 2012) and near the confluence of Moonshine Creek (six juvenile FYLF, probably including young-of-year in August 2012). As will be described below, for the Our House Diversion Dam Reach, proposed Condition AR2 should also minimize the frequency and magnitude of flow changes downstream of the confluence of Oregon Creek with the potential to adversely affect FYLF.

North Yuba River – New Bullards Bar Dam Reach

The flow releases from the New Bullards Bar Dam directly affect the 2.4-m section of the North Yuba River from the New Bullards Bar Dam to the North Yuba River's confluence with the Middle Yuba River (i.e., New Bullards Bar Dam Reach). The overall gradient in the reach is 2 percent, with a maximum gradient of 5.5 percent at approximately RM 1. In the 1.1 mi of the reach that had on-the-ground habitat mapping done, there was 511 sq ft of trout spawning sized gravel. YCWA estimated this size gravel becomes mobile at a flow of 126 cfs, which has a return interval of less than 1 year under Without-Project hydrology and 1.6 years under With-Project hydrology. The steep and confined nature of the canyon, relatively high frequency of spill flows, as shown in Table E2-9, and lack of spawning size gravel without enormously expensive mechanical augmentation in this reach yield relatively poor habitat with little potential

for practical lasting improvement. Even if fish did spawn in this reach, about every other year, most of the spawning substrate would be flushed out.

Table E2-9. Probability of maximum annual New Bullards Bar Dam spill under With-Project Hydrology (WY 1970-2010).

Maximum Annual Spill (cfs)	Number of Years Maximum Flow Exceeded (yrs)	Probability of Exceeding Maximum Annual Flow (%)
1,000	21	51%
5,000	17	41%
10,000	14	34%
20,000	10	24%
50,000	1	2%

YCWA's 2012 stream fish surveys found three fishes in the North Yuba River at the one site surveyed by snorkeling: RM 0.2 just upstream of the Middle Yuba River confluence. YCWA found Sacramento sucker, rainbow trout and smallmouth bass with calculated densities of 3,203, 567 and 14 fish per mile, respectively. Rainbow trout lengths were estimated between 0 and 200 mm.

Using PHABSIM, YCWA developed WUA curves as part of the Instream Flow Study. For the rainbow trout adult life stage, the 100 and 80 percent of maximum static WUA were 600 and 90 cfs, respectively; for the rainbow trout spawning life stage the 100 and 80 percent of maximum static WUA were 120 and 53 cfs, respectively; and for the rainbow trout juvenile life stage the 100 and 80 percent of maximum static WUA were 60 cfs and 15 cfs, respectively.

YCWA's 2008 through 2012 water temperature monitoring occurred at two locations: RM 2.3 immediately below New Bullards Bar Dam from July 2008 through October 2012, and RM 0.1 immediately upstream of the Middle Yuba River confluence from July 2008 through October 2012. At RM 2.3, YCWA found that the mean and maximum daily water temperatures in July were 10.2°C and 11.7°C, respectively; and mean and maximum daily water temperatures in August were 10.3°C and 11.9°C, respectively. Mean daily water temperature never exceeded 20°C. At RM 0.1, YCWA found that the mean and maximum daily water temperatures in July were 21.6°C and 23.9°C, respectively; and mean and maximum daily water temperatures in August were 20.5°C and 23.5°C, respectively. Mean daily water temperatures exceeded 20°C in July and August 90 percent and 76 percent of the time, respectively.

No egg masses, tadpoles, juvenile or adult FYLF were found in the reach during YCWA's visual encounter surveys (VES) at one site surveyed in 2012, nor were any incidental observations of FYLF recorded during other studies.

Table E2-10 shows the percent of maximum WUA in the New Bullards Bar Dam Reach for rainbow trout adult, spawning and juvenile life stages using the minimum flow releases from New Bullards Bar Dam shown in Table 1.

Table E2-10. Percent of maximum WUA for rainbow trout adult, spawning and juvenile life stages in the New Bullards Bar Reach that correspond with YCWA's proposed Condition AR1.

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
RAINBOW TROUT – ADULT LIFE STAGE						
October	10%	13%	24%	24%	24%	24%
November	10%	13%	24%	24%	24%	24%
December	10%	13%	24%	24%	24%	24%
January	10%	13%	24%	24%	24%	24%
February	10%	13%	24%	24%	24%	24%
March	10%	13%	24%	24%	22%	21%
April	10%	10%	10%	10%	10%	10%
May	10%	10%	10%	10%	10%	10%
June	10%	10%	10%	10%	10%	10%
July	10%	13%	24%	24%	22%	21%
August	10%	13%	24%	24%	22%	21%
September	10%	13%	24%	24%	22%	21%
RAINBOW TROUT – SPAWNING LIFE STAGE						
April	44%	44%	44%	44%	44%	44%
May	44%	44%	44%	44%	44%	44%
June	44%	44%	44%	44%	44%	44%
RAINBOW TROUT – JUVENILE LIFE STAGE						
October	63%	69%	83%	83%	83%	83%
November	63%	69%	83%	83%	83%	83%
December	63%	69%	83%	83%	83%	83%
January	63%	69%	83%	83%	83%	83%
February	63%	69%	83%	83%	83%	83%
March	63%	69%	83%	83%	81%	80%
April	63%	63%	63%	63%	63%	63%
May	63%	63%	63%	63%	63%	63%
June	63%	63%	63%	63%	63%	63%
July	63%	69%	83%	83%	81%	80%
August	63%	69%	83%	83%	81%	80%
September	63%	69%	83%	83%	81%	80%

Table E2-11 provides habitat over time in the North Yuba River.

Table E2-11. Percent of habitat AUC that corresponds with YCWA's proposed Condition AR1 for rainbow trout adult, juvenile and spawning life stages as compared to the No Action Alternative in the New Bullards Bar Dam Reach of the North Yuba River. Comparison made using all WYs in the period of record (WYs 1970 through 2010).

Rainbow Trout Life Stage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
NORTH YUBA RIVER - NODE 0 - ALL WATER YEARS - SUM OF AUC 1% to 100%												
Adult	198.3%	198.3%	193.3%	168.8%	169.1%	141.9%	99.3%	104.0%	98.0%	188.7%	188.5%	188.5%
Juvenile	123.2%	123.2%	123.0%	121.8%	122.0%	118.5%	99.9%	100.2%	100.0%	121.4%	121.3%	121.3%
Spawning	--	--	--	--	--	--	99.9%	100.3%	100.3%	--	--	--
NORTH YUBA RIVER - NODE 1 - ALL WATER YEARS - SUM OF AUC 1% to 100%												
Adult	196.0%	187.4%	171.7%	148.9%	145.5%	129.5%	99.2%	103.4%	98.2%	186.0%	187.2%	187.3%
Juvenile	122.7%	120.9%	118.3%	115.0%	113.4%	110.5%	100.0%	100.1%	100.0%	120.8%	121.1%	121.1%
Spawning	--	--	--	--	--	--	100.0%	100.2%	100.4%	--	--	--

YCWA's Proposed Project releases at New Bullards Bar Dam resulted in an increase in available habitat for all species and life stages in most months. For example, due to increased minimum flow releases significant increases in habitat result for both the Adult and Juvenile life stages

July through March as compared to the No Action Alternative. For most species, YCWA's Proposed Project releases showed very little effect on habitat during the spring as streamflows did not change, on average by more than ±1 cfs from the No Action Alternative.

YCWA did not detect FYLF downstream of New Bullards Bar Dam during surveys or as a result of incidental observations. These results suggest that established FYLF populations likely do not occur and therefore, the proposed Project will have no foreseeable effect on FYLF in the reach. Because there are no apparent barriers to dispersal, individual FYLF may occur infrequently.

Yuba River – North/Middle Yuba Rivers Reach

Releases from Log Cabin Diversion Dam, Our House Diversion Dam and New Bullards Bar affect the 5.7 mi long Yuba River from the confluence of the Middle and North Yuba rivers to just above New Colgate Powerhouse (North/Middle Yuba River Reach). The overall gradient in the reach is 2.0 percent, with some steeper sections near 5 percent. In the portion of the reach that had on-the-ground habitat mapping done, there was 1,373 sq ft of trout spawning sized gravel, and YCWA estimated this size gravel becomes mobile at a flow of 83 cfs, which has a return interval of less than 1 year under both Without-Project and With-Project hydrologies.

YCWA's 2012 stream fish surveys found two fishes in the Yuba River at the one site surveyed by snorkeling: RM 35.0 upstream of New Colgate Powerhouse. YCWA observed smallmouth bass and rainbow trout and calculated the abundances to be 1,409 smallmouth bass and 108 rainbow trout per mile.

Using PHABSIM, YCWA developed WUA curves for rainbow trout adult and spawning life stages for the reach. The 100 and 80 percent of maximum static WUA for the rainbow trout adult life stage were 140 and 70 cfs, respectively; the 100 and 80 percent of maximum static WUA for the rainbow trout spawning life stage were 800 cfs and 415 cfs, respectively; and the 100 and 80 percent of maximum static WUA for the rainbow trout juvenile life stage were 40 and 22 cfs, respectively.

YCWA's 2008 through 2012 water temperature monitoring occurred at two locations: RM 39.7 immediately below the confluence of the Middle and North Yuba rivers from July 2008 through October 2012, and RM 34.4 immediately upstream of the New Colgate Powerhouse from July 2008 through October 2012. At RM 39.7, YCWA found that the mean and maximum daily water temperatures in July were 23.0 °C and 25.4°C, respectively, and mean and maximum daily water temperatures in August were 21.8°C and 25°C, respectively. In July and August, mean daily water temperature exceeded 20°C 94 percent and 93 percent of the time, respectively. At RM 34.4, YCWA found that the mean and maximum daily water temperatures in July were 23.0°C and 26.4°C, respectively; and mean and maximum daily water temperatures in August were 22.1°C and 25.7°C, respectively. Mean daily water temperature exceeded 20°C in July and August 94 percent and 93 percent of the time, respectively. Similar statistics for modeled water temperature data at these two sites for the entire 40-year period of record are available in the Minimum Flow Matrix on the Relicensing Website (link above).

YCWA's Operations Model and Upper Temperature Model were used to examine what releases from New Bullards Bar Dam would be needed to maintain water temperatures in this reach below 20°C. Proposed minimum flows below Our House and Log Cabin Diversion Dams were combined with various constant minimum flows below New Bullards Bar Dam ranging between 7 cfs and 300 cfs. Figure E2-3 shows the Yuba River location where temperatures from that point and upstream never exceed 20°C for the various flows.

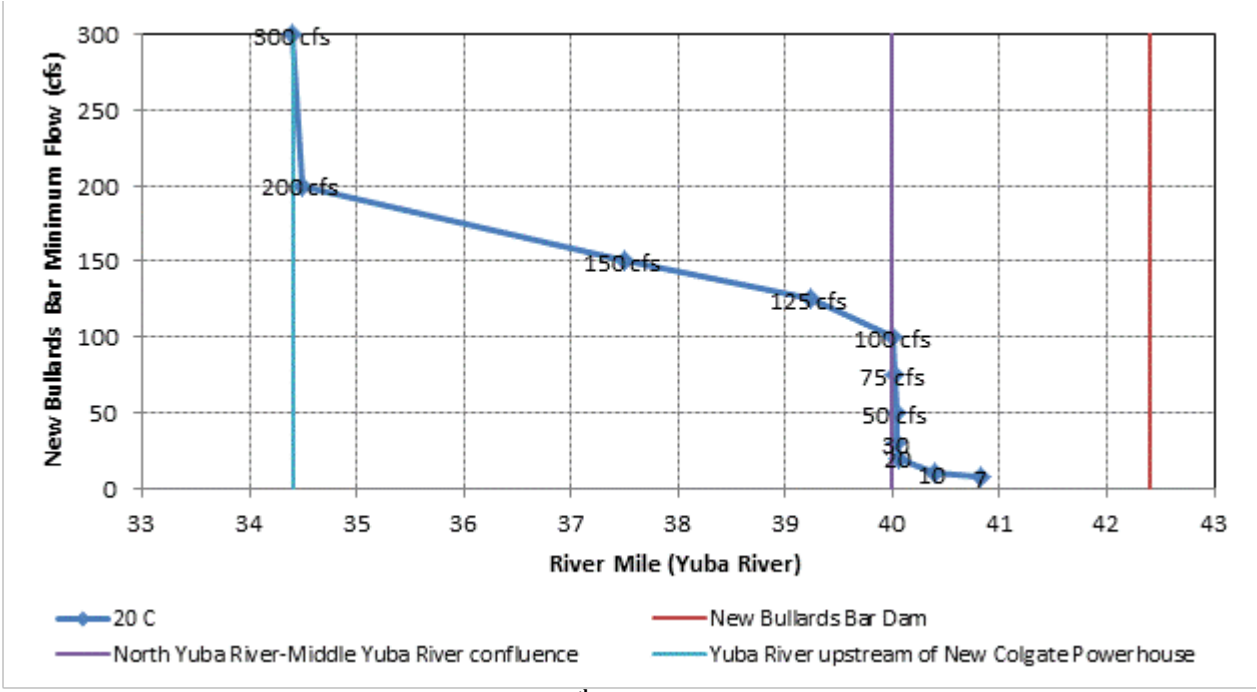

Figure E2-3. Yuba River location of the 100th percentile exceedance of 20°C per constant release below New Bullards Bar Dam.

The figure shows that New Bullards Bar Dam releases in excess of 100 cfs are needed before temperatures less than 20°C are maintained at any point in the Yuba River below the North and Middle Yuba River confluence. Flow from the Middle Yuba River regularly exceeds 20°C in summer. New Bullards Bar Dam releases in excess of 200 cfs are needed to maintain temperatures below 20°C for the entire 5.7-long reach, down to New Colgate Powerhouse.

No egg masses, tadpoles, juvenile or adult FYLF were found in the reach during YCWA's VES at two sites in 2012 and a repeat survey of one of the sites in 2013, nor were any incidental observations of FYLF recorded during other studies.

YCWA's stepwise process in this reach focused on the rainbow trout adult life stage, except for April through June, when rainbow trout spawning life stage was targeted. YCWA did not target the rainbow trout juvenile life stage because the flow at which the maximum amount of habitat for juveniles occurs (i.e., 40 cfs) is less than that for both spawning and adults, so setting flows for adults and spawning was assumed to maintain or enhance habitat for the juvenile life stage.

In the first step, YCWA populated the flow matrix as follows:

- Wet WYs – 100 percent of the maximum static WUA flows, which resulted in 138 cfs in the adult months and 755 cfs in the spawning months
- Above Normal WYs – 90 percent of the maximum static WUA flows, which resulted in 88 cfs in the adult months and 488 cfs in the spawning months
- Below Normal WYs – 85 percent of the maximum static WUA flows, which resulted in 78 cfs in the adult months 77 cfs in the spawning months
- Dry WYs – 80 percent of the maximum static WUA flows, which resulted in 69 cfs in the adult months and 46 cfs in the spawning months
- Critically Dry WYs – 64 percent of the maximum static WUA flows, which resulted in 48 cfs in the adult months and 22 cfs in the spawning months
- Extreme Critically Dry WYs – the lowest minimum flow release in existing license in any month (3.5 cfs from NBB, 5.6 cfs from LCD and 21 cfs from OHD) which yielded 45 percent of maximum WUA for adult and 72 percent of maximum WUA for spawning.

In the second step, YCWA reviewed the rainbow trout adult and spawning WUA curves with Wet WYs in mind. YCWA found that in the Wet WYs, a flow of 104 cfs provides 95 percent of the static WUA for adults. Since this was a reduction of 34 cfs (25%) from the maximum of 138 cfs with only a 5 percent reduction in habitat, YCWA changed the flows from July through March of Wet WY months to 104 cfs. For spawning, YCWA found that in the Wet and Above Normal WYs, the target WUA of 100 percent and 90 percent required flows of 755 cfs and 488 respectively. However, the 85 percent WUA value requires only 77 cfs, so YCWA used that value for Wet, Above Normal and Below Normal WYs. Using the 85 percent value was a difference in habitat of 15 percent and but saved between 400 and 680 cfs. YCWA did the same analysis for the other WYs, but found that any significant reduction in flow from the initial flow numbers also significantly reduced habitat from the target, so YCWA did not modify any other WYs in this step. Since the adult WUA values using this methodology were higher, even in the spawning months, YCWA applied those values year round.

Table E2-12 shows the final percent of maximum WUA for the NYR/MYR Reach for rainbow trout adult and spawning life stages. Juvenile life stage information was included in the table below, though flow release proposals were not based on the juvenile habitat results.

Table E2-12. Percent of maximum WUA for rainbow trout adult, spawning and juvenile life stages in the North/Middle Yuba River Reach that correspond with YCWA's proposed Condition AR1.

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
RAINBOW TROUT – ADULT LIFE STAGE						
October	47%	64%	79%	85%	85%	85%
November	47%	64%	79%	85%	85%	85%
December	47%	64%	79%	85%	85%	85%
January	47%	64%	79%	85%	85%	85%
February	47%	64%	79%	85%	85%	85%
March	47%	64%	79%	85%	90%	95%
April	47%	68%	82%	87%	93%	97%

Table E2-12. (continued)

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
RAINBOW TROUT – ADULT LIFE STAGE (continued)						
May	47%	68%	82%	87%	93%	97%
June	47%	68%	82%	87%	93%	97%
July	47%	68%	82%	87%	93%	97%
August	47%	68%	82%	87%	93%	97%
September	47%	64%	79%	85%	90%	95%
RAINBOW TROUT – SPAWNING LIFE STAGE						
April	73%	82%	85%	83%	80%	76%
May	73%	82%	85%	83%	80%	76%
June	73%	82%	85%	83%	80%	76%
RAINBOW TROUT – JUVENILE LIFE STAGE						
October	97%	100%	98%	96%	96%	96%
November	97%	100%	98%	96%	96%	96%
December	97%	100%	98%	96%	96%	96%
January	97%	100%	98%	96%	96%	96%
February	97%	100%	98%	96%	96%	96%
March	97%	100%	98%	96%	94%	90%
April	97%	100%	97%	95%	92%	87%
May	97%	100%	97%	95%	92%	87%
June	97%	100%	97%	95%	92%	87%
July	97%	100%	98%	96%	94%	90%
August	97%	100%	98%	96%	94%	90%
September	97%	100%	98%	96%	94%	90%

Table E2-13 provides habitat over time in the North Yuba River.

Table E2-13. Percent of habitat AUC that corresponds with YCWA's proposed Condition AR1 for rainbow trout adult, juvenile and spawning life stages as compared to the No Action Alternative in the Middle/North Yuba River Reach. Comparison made using all WYs in the period of record (WYs 1970 through 2010).

Rainbow Trout Life Stage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
YUBA RIVER - NODE 1 - ALL WATER YEARS - SUM OF AUC 1% to 100%												
Adult	107.3%	108.0%	106.9%	103.7%	101.2%	99.4%	99.4%	98.8%	106.1%	116.2%	110.6%	106.2%
Juvenile	98.7%	97.4%	96.2%	95.8%	96.0%	95.5%	97.5%	97.5%	94.1%	94.9%	98.3%	99.1%
Spawning	--	--	--	--	--	--	99.3%	100.3%	96.1%	--	--	--

The combined effect of proposed Project releases at each Project Facility upstream of this reach resulted in an increase in habitat for Adult rainbow trout all months but March through May where average monthly streamflows exceeded the discharge values associated with optimal WUA. In general, there was little change in rainbow trout spawning habitat, though increased flows in June resulted in a four percent habitat reduction. While increases to the adult life stage habitat were observed, juvenile rainbow trout shows slight reductions in habitat year round as compared to the No Action Alternative.

YCWA did not detect FYLF in this reach of the Yuba River during surveys or as a result of incidental observations. These results suggest that established FYLF populations likely do not

occur and therefore, the proposed Project will have no foreseeable effect on FYLF in the reach. Because there are no apparent barriers to dispersal, individual FYLF may occur infrequently.

E2.4.2 YCWA's Proposed Condition AR2: Control Project Spills at Our House Diversion Dam[20]

Licensee shall, from May 1 through July 15 of each year, implement a spill cessation schedule at Our House Diversion Dam by adjusting the low level (5-foot diameter) outlet valve in the dam. Specifically, when a spill at the dam of greater than 200 cfs mean daily flow occurs, measured as the amount of flow below the dam that is above the required minimum flow at that time, Licensee shall commence spill reduction measures to operate the low level outlet valve as follows:

1. For average daily flows below the dam that peak at greater than the required instream flow plus 600 cfs, (i.e. the release capacity of the 5 ft diameter sluice valve at a dam crest pool elevation), once the flow below the dam recedes to 600 cfs plus the required minimum instream flow, Licensee shall fully open the low level outlet.
2. After a minimum of 48 hours with the low level outlet valve fully open, Licensee shall close the low level outlet valve so that flows below the dam reduce at a rate of approximately 100 cfs every 48 hours due to low level outlet valve opening reductions.
3. For average daily flows below the dam that peak at less than the required minimum instream flow plus 600 cfs, but greater than 100 cfs plus the required minimum instream flow, once flows begin to recede, Licensee shall open the low level outlet valve to the point where water is no longer spilling over the dam. The low level outlet valve opening shall remain at that amount for a minimum of 48 hours, at which time Licensee shall close the low level outlet valve so that flows below the dam are reduced at a rate of approximately 100 cfs every 48 hours due to low level outlet valve opening reductions.
4. If, during the time Licensee is implementing paragraphs 1, 2 and 3 above, the dam pool elevation due to inflow to the impoundment lowers (i.e., not Licensee's operation of the low level outlet) such that the low level outlet valve release is reduced faster than 100 cfs every 48 hours, Licensee shall make valve opening reductions no faster than 20 percent of full valve stem rise every 48 hours, until the low level outlet valve is fully closed.
5. If, during the time Licensee is implementing paragraphs 1, 2 and 3 above, the flow below the dam increases as a result of increased inflow into the impoundment and re-initiation of spill over the dam occurs, Licensee shall open the low level outlet valve to eliminate spill at the dam and the low level outlet valve opening will remain at that amount a minimum of 48 hours, and the procedure of stepwise closing of the valve, as described in bullet 4 above, will commence. If the reinitiated spill results in a flow greater than the

[20] YCWA's proposed Condition AR2 assumes that the maximum capacity of Our House Diversion Dam's low level (5-foot diameter) outlet valve is 600 cfs when the impoundment behind the dam is at the invert elevation of the Lohman Ridge Diversion Tunnel. YCWA plans to rate the outlet in spring 2015. Based on the spring 2015 rating, YCWA may amend this proposed condition.

required minimum instream flow plus 600 cfs below the dam, Licensee shall close the low level outlet valve until such time as steps one and two of this operation can commence again.

6. If, during the time Licensee is implementing paragraphs 1, 2 and 3 above, the flow below the dam increases as a result of increased inflow into the impoundment and re-initiation of spill over the dam does not occur, Licensee shall maintain the current opening of the low level outlet valve until flows either cause spill or decrease to a level approximately equal to that occurring when the increase began.

The fish release valve and Lohman Ridge Diversion Tunnel shall remain open throughout this procedure.

For the purposes of this condition: 1) The mean daily flow shall be measured downstream of Our House Diversion Dam at USGS streamflow gage 11408880; 2) compliance for this measure when pool elevations do not allow compliance with the flow ramping rate shall be adjustments to the valve as stem rise changes; 2) opening and closing valves between the valve settings described above may be made in one valve adjustment (i.e., ramping between settings is not required); and 3) the valve adjustments shall be made by noon on the day following the day the flow below the dam triggers this operation, providing there is safe access to the site.

Licensee shall make available to the Forest Service, SWRCB and Cal Fish and Wildlife the streamflow records related to the spill cessation schedules upon request.

This condition does not apply in instances when Licensee is directed by the Commission or California Division of Safety of Dams to test (i.e., exercise) valves at the dams (i.e., quickly open and close the valve). Licensee shall make a good faith effort to schedule such tests after September of each calendar year to avoid adverse effects on aquatic species.

This condition is subject to temporary modification if required for repairs to the dam or associated equipment, by equipment malfunction, as directed by law enforcement authorities, or in emergencies. An emergency is defined as an outage due to an event that is reasonably out of the control of Licensee and requires Licensee to take immediate action, either unilaterally or under instruction of law enforcement, emergency services, or other regulatory agency staff, including actions to prevent or reduce the imminent loss of human life or damage to property. An emergency may include, but is not limited to: natural events such as landslides, storms, or wildfires; vandalism; malfunction or failure of Project works; or other public safety incidents. If Licensee temporarily modifies the requirements of this condition, Licensee shall make all reasonable efforts to promptly resume performance of the requirements and shall notify the Forest Service, SWRCB, and Cal Fish and Wildlife within 48 hours of the modification. Licensee shall provide notification to the Commission as soon as possible but no later than 10 days after such incident.

Licensee shall commence the dam spill cessation schedules in this part within the first 90 days of the new license term unless facility modifications or construction is required. Where facilities must be modified or constructed to allow compliance with the required spill cessation schedule,

including flow measurement facilities, except as otherwise provided, Licensee shall submit applications for permits to modify or construct the facilities as soon as reasonably practicable but no later than within the first 2 years of the new license term, and will complete the work as soon as reasonably practicable but no later than 2 years after receiving all required permits and approvals for the work. During the period before facility modifications or construction are completed, and starting within the first 90 days of the new license term, Licensee shall make a good faith effort to provide the specified spill cessation schedules within the reasonable capabilities of the existing facilities.

Rationale Statement in Support of YCWA's Condition AR2. Condition AR2 minimizes the frequency and magnitude of flow changes that would have the potential to adversely affect FYLF. YCWA's proposed spill cessation schedule for Our House Diversion Dam will be in effect from May 1 through July 15 of each year, encompassing the period during which FYLF breeding and early development is most likely to occur. The spill cessation schedule provides for a stepped reduction in spills so that down-ramping is gradual. Based on modeled application of the spill cessation measure to flows in the 40 year period of record, the proposed spill cessation tends to prolong the total length of time during which high flows from spill occur and reduce the magnitude of daily decreases in flow. In some years, intervals between spills are also eliminated. High velocities are generally a deterrent to FYLF breeding (Kupferberg 1996, Wheeler and Welsh 2008). Therefore, a prolonged spill will minimize the likelihood that FYLF breeding occurs prior to a spill compared to a series of separate spill events.

In addition, Condition AR2 minimizes the frequency and magnitude of flow changes with the potential to adversely affect stream fish populations. YCWA's proposed spill cessation schedule encompasses the period during which rainbow trout spawning, incubation and emergence are most likely to occur. As described above, the spill cessation schedule provides for a stepped reduction in spills so that down-ramping is gradual while prolonging the total length of time during which each spill event occurs.

Figures E2-4, E2-5 and E2-6 give examples of spill events where spill cessation would be implemented under Condition AR2 (red lines) as compared to the No Action Alternative (blue lines) and Without-Project (green lines) downstream of Our House Diversion Dam using output from the Operations Model. These examples show that YCWA's proposed Project mimics the Without-Project hydrograph much better than under the No Action Alternative. Reductions in flow are more gradual and spill periods are prolonged.

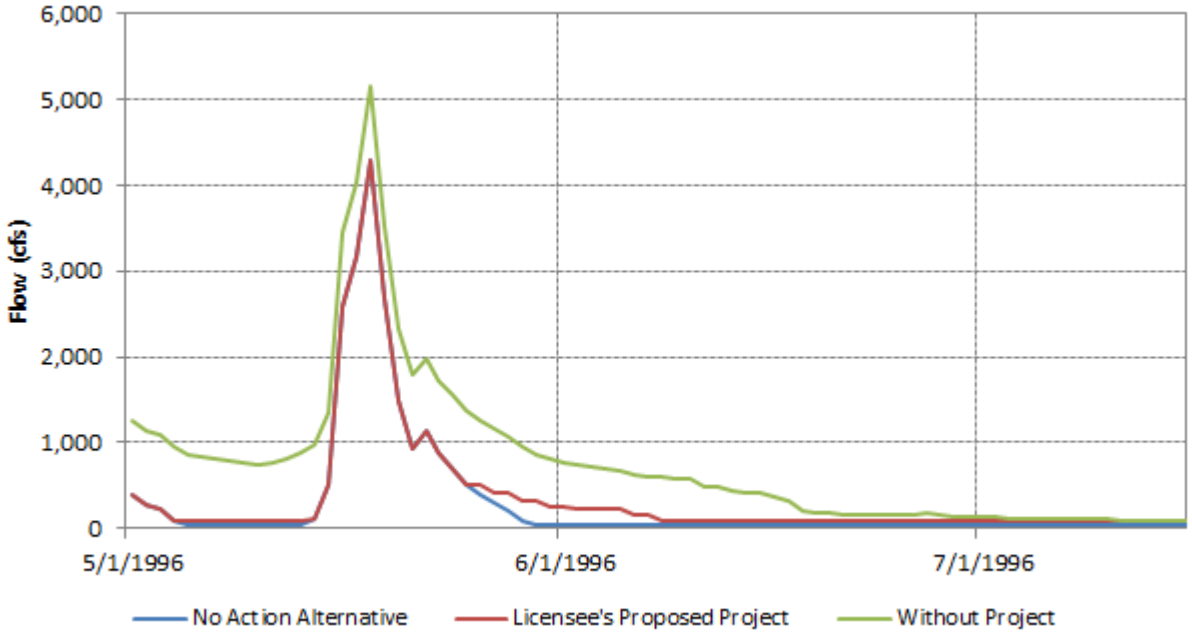

Figure E2-4. Example of spill cessation below Our House Dam under the No Action Alternative (blue line), YCWA's Proposed Project (red line), and Without-Project (green line) from May 1 through July 15, 1996.

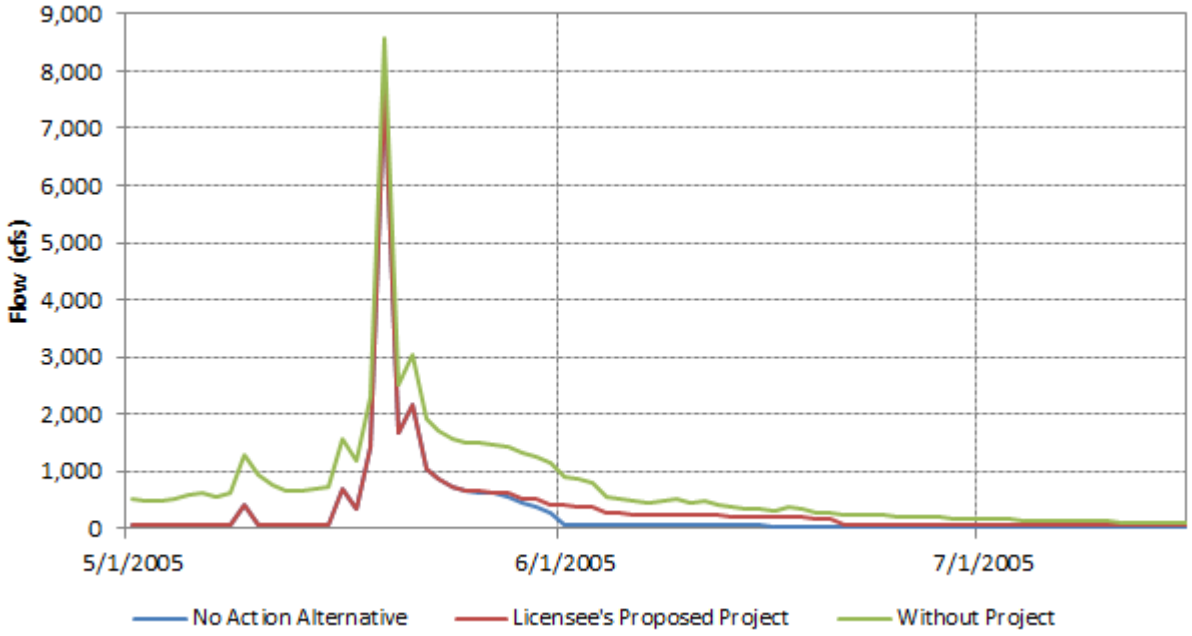

Figure E2-5. Example of spill cessation below Our House Dam under the No Action Alternative (blue line), YCWA's proposed Project (red line), and Without-Project (green line) from May 1 through July 15, 2005.

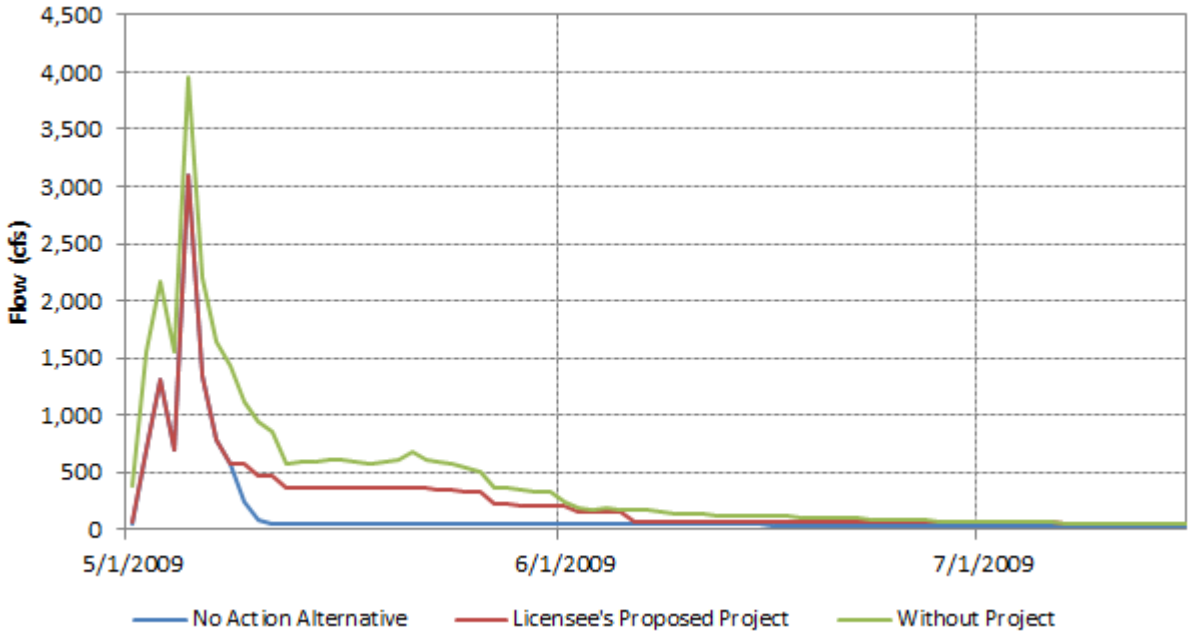

Figure E2-6. Example of spill cessation below Our House Dam under the No Action Alternative (blue line), YCWA's proposed Project (red line), and Without-Project (green line) from May 1 through July 15, 2009.

E2.4.3 YCWA's Proposed Condition AR3: Maintain Minimum Streamflows Downstream of Narrows 2 Powerhouse and Narrows 2 Full Bypass

Licensee, in coordinated operations with the licensee for the Narrows Project (FERC No. 1403) under the coordinated operations agreement or Commission order described in License's proposed Condition GEN7, shall meet the minimum streamflows in the Yuba River shown in Table 1 of this condition. These streamflows shall be measured at the indicated USGS gages, which are located downstream of the combined releases of the Narrows Project, the Narrows 2 Powerhouse and the Narrows 2 Full Bypass. Licensee shall record minimum streamflow at all gages as required by USGS (Article 8 of FERC's Form L-5, Standard Articles).

Table 1. Minimum Streamflows in cubic feet per second (cfs) for the Yuba River Development Project by month and Water Year Type, which is defined in Licensee's proposed Condition WR3.

Month	Schedule 1	Schedule 2	Schedule 3	Schedule 4	Schedule 5	Schedule 6	Conference Year
YUBA RIVER - BELOW NARROWS 2 POWERHOUSE/NARROWS 2 FULL BYPASS (COMPLIANCE POINT: USGS STREAMFLOW GAGE 11418000)							
October 1 – 15	700	700	700	700	600	600	500
October 16 - 31	700	700	700	700	600	600	500
November 1 - 30	700	700	700	700	600	600	500
December 1 - 31	700	700	700	700	550	550	500
January 1- 15	700	700	700	700	550	550	500
January 16 – 31	700	700	700	700	550	550	500
February 1 - 29	700	700	700	700	550	550	500

Table 1. (continued)

Month	Schedule 1	Schedule 2	Schedule 3	Schedule 4	Schedule 5	Schedule 6	Conference Year
YUBA RIVER - BELOW NARROWS 2 POWERHOUSE/NARROWS 2 FULL BYPASS (COMPLIANCE POINT: USGS STREAMFLOW GAGE 11418000) (continued)							
March 1- 31	700	700	700	700	550	550	500
April 1 – 15	700	700	700	700	600	600	500
April 16 – 30	--	--	--	--	--	--	--
May 1 – 15	--	--	--	--	--	--	--
May 16 – 31	--	--	--	--	--	--	--
June 1 - 15	--	--	--	--	--	--	--
June 16 – 30	--	--	--	--	--	--	--
July 1 – 31	--	--	--	--	--	--	--
August 1 – 31	--	--	--	--	--	--	--
September 1 – 30	700	700	700	700	500	500	500
YUBA RIVER - BELOW NARROWS 2 POWERHOUSE/NARROWS 2 FULL BYPASS (COMPLIANCE POINT: USGS STREAMFLOW GAGE 11421000)							
October 1 - 15	500	500	500	400	400	350	350
October 16 - 31	500	500	500	400	400	350	350
November 1 - 30	500	500	500	500	500	350	350
December 1 - 31	500	500	500	500	500	350	350
January 1- 15	500	500	500	500	500	350	350
January 16 – 31	500	500	500	500	500	350	350
February 1 - 29	500	500	500	500	500	350	350
March 1- 31	700	700	500	500	500	350	350
April 1 - 15	1,000	700	700	600	500	350	300
April 16 - 30	1,000	800	700	900	600	500	245
May 1 - 15	2,000	1,000	900	900	600	500	245
May 16 - 31	2,000	1,000	900	600	400	400	245
June 1 - 15	1,500	800	500	400	400	300	245
June 16 - 30	1,500	500	500	400	400	150	150
July 1 - 31	700	500	500	400	400	150	150
August 1 - 31	600	500	500	400	400	150	150
September 1 - 30	500	500	500	400	400	350	150

Minimum streamflows in this condition shall mean the 5-day running average of average daily streamflows, with the 15-minute flows not less than 90 percent of the specified flow requirement in Table 1 of this condition. In addition, 15-minute flows shall not be less than the applicable flow requirement specified in Table 1 for more than 48 consecutive hours.

Minimum streamflows in this condition may be temporarily modified for short periods, as necessary for powerhouse outages required for inspections and maintenance purposes, upon approval of the Commission.

Minimum streamflows may be temporarily modified due to an emergency. An emergency is defined as an outage due to an event that is reasonably out of the control of Licensee and requires Licensee to take immediate action, either unilaterally or under instruction of law enforcement, emergency services, California ISO or other regulatory agency staff, including actions to prevent or reduce the imminent loss of human life or damage to property. An emergency may include, but is not limited to: natural events such as earthquakes, landslides, storms, or wildfires; vandalism; malfunction or failure of PG&E Transmission lines or Project works; or other public

safety incidents. If Licensee temporarily modifies the requirements of this condition due to an emergency, Licensee shall make all reasonable efforts to promptly resume performance of the requirements, and shall notify the NMFS, USFWS, Cal Fish and Wildlife and the SWRCB within 48 hours of the start of the modification. Licensee shall provide notification to the Commission as soon as possible but no later than 10 days after such incident.

If any of the minimum flow requirements in YCWA's water right permits are temporarily modified by the SWRCB or its Deputy Director for Water Rights, and if Licensee, NMFS, USFWS and Cal Fish and Wildlife agree, then Licensee may make corresponding temporary modifications to the requirements in this condition. Licensee shall provide notification to the Commission as soon as possible but no later than 10 days after such temporary modifications are made.

Rationale Statement in Support of YCWA's Condition AR3. In 2002 through 2005, representatives of YCWA, Cal Fish and Wildlife, NMFS, USFWS, and several NGO's negotiated a set of minimum flow requirements (flow schedules) for the Yuba River downstream of Englebright Dam. The flow schedules settled a contested SWRCB water rights hearing and related litigation regarding lower Yuba River minimum flow requirements that had been pending for many years. The flow schedules developed by this group then were included in the Yuba Accord Fisheries Agreement, which was one of three related agreements that together are known as the "Lower Yuba River Accord."

During 2005-2007, YCWA conducted a comprehensive CEQA/NEPA process to analyze the environmental effects of the Yuba Accord, and in late 2007 YCWA certified its final EIR for the Yuba Accord. On May 20, 2008, the SWRCB adopted its Corrected Order WR 2008-0014, which amended YCWA's water right permits to incorporate the Yuba Accord flow schedules.

The Yuba Accord Fisheries Agreement, which was executed by YCWA, Cal Fish and Wildlife and four NGO's, and supported by NMFS and USFWS, contains the following language:

> The Parties intend that their monitoring and data-collection actions will produce a useful database for the proceedings of the Federal Energy Regulatory Commission regarding the relicensing of YCWA's FERC License for the Yuba Project, which expires in 2016. The Parties also intend that this monitoring and data-collection be used to evaluate the biological provisions of this Agreement.

Besides conducting the analysis of the Yuba Accord that is in YCWA's Yuba Accord EIR, YCWA also has established the RMT, which is comprised of representatives of YCWA, Cal Fish and Wildlife, NMFS, USFWS, and NGO's. The primary purpose of the RMT is to evaluate the effects of implementation of the Yuba Accord on anadromous fish in the lower Yuba River. YCWA has funded a monitoring plan since 2007, and the RMT has issued Draft and Revised Draft Interim Monitoring and Evaluation reports (available on the RMT web site at http://www.yubaaccordrmt.com/Interim%20ME%20Report/Forms/AllItems.aspx). At this time, and based on the study work conducted to date, the RMT is not recommending any changes to the Yuba Accord flow schedules.

Throughout the relicensing process, YCWA has described the genesis of the Yuba Accord flow schedules to relicensing stakeholders, and has strongly suggested that these recently and collaboratively developed and thoroughly analyzed flow schedules should be incorporated into YCWA's new license as the new lower Yuba River minimum instream flow requirements.

For Schedule 1 through Schedule 6 years, the proposed minimum streamflows in Table 1 of the condition are the same as the corresponding minimum instream flow requirements in the Yuba Accord's Fisheries Agreement, as ordered by the SWRCB in its Corrected Order WR 2008-0024 on pages 56-57 in term 1. (See also, SWRCB Corrected Order WR 2008-0014, fig. 2.) For Conference Years, there are some differences between YCWA's proposed condition and the corresponding requirements in Corrected Order WR 2008-0014. (See SWRCB Corrected Order WR 2008-0014, p. 57 and fig. 7.) These differences are shown in the following Table E2-13 and the reasons for them are discussed below.

Table E2-13. Proposed changes in Conference Year minimum streamflows in cubic feet per second (cfs) for the Yuba River Development Project by month.

Month	Yuba Accord Conference Year Requirements	YCWA's Proposed Condition AR3 Conference Year Requirements
YUBA RIVER - BELOW NARROWS 2 POWERHOUSE/NARROWS 2 FULL BYPASS (COMPLIANCE POINT: USGS STREAMFLOW GAGE 11418000 – YUBA RIVER NEAR SMARTSVILLE)		
October 1 – 15	--	500
October 16 - 31	600	500
November 1 - 30	600	500
December 1 - 31	600	500
January 1- 15	1,000	500
January 16 – 31	800	500
February 1 - 29	800	500
March 1- 31	800	500
April 1 – 15	--	500
April 16 – 30	--	--
May 1 – 15	--	--
May 16 – 31	--	--
June 1 - 15	--	--
June 16 – 30	--	--
July 1 – 31	--	--
August 1 – 31	--	--
September 1 – 30	--	500
YUBA RIVER - BELOW NARROWS 2 POWERHOUSE/NARROWS 2 FULL BYPASS (COMPLIANCE POINT: USGS STREAMFLOW GAGE 11421000 – MARYSVILLE)		
October 1 - 15	400	350
October 16 - 31	400	350
November 1 - 30	400	350
December 1 - 31	400	350
January 1- 15	245	350
January 16 – 31	245	350
February 1 - 29	245	350
March 1- 31	245	350
April 1 - 15	245	300
April 16 - 30	245	245
May 1 - 15	245	245
May 16 - 31	245	245
June 1 - 15	245	245
June 16 - 30	245	150

Table E2-13. (continued)

Month	Yuba Accord Conference Year Requirements	YCWA's Proposed Condition AR3 Conference Year Requirements
YUBA RIVER - BELOW NARROWS 2 POWERHOUSE/NARROWS 2 FULL BYPASS (COMPLIANCE POINT: USGS STREAMFLOW GAGE 11421000 – MARYSVILLE) (continued)		
July 1 - 31	70	150
August 1 - 31	70	150
September 1 - 30	70	150

The Yuba Accord Conference Year flow schedules are the same as the minimum flow schedules in Article 33 of YCWA's existing license, which was issued in 1963 and amended in 1966, without the critically dry WY reductions that are authorized by Article 33. The primary reason for including the Article 33 schedules as the Yuba Accord Conference Year schedules was that, when the Yuba Accord's minimum streamflows were being developed, there was no pending relicensing proceeding through which YCWA could have asked FERC to change the flow schedules in the existing license. Because YCWA must comply with these Article 33 requirements until they are superseded by new requirements in a new license, YCWA and the other parties to the Yuba Accord Fisheries Agreement agreed that the Yuba Accord Conference Year requirements would be the same as the Article 33 requirements, with the understanding that these requirements could be re-evaluated and possibly changed during YCWA relicensing proceeding. YCWA now is proposing such a re-evaluation and the changes in these requirements that are shown in Table E2-13.

If these changes are made, then the total volume of water that will be required to flow past the USGS Marysville gage during Conference Years will increase from the 174,208 ac-ft required to meet the Yuba Accord Conference Year requirements to a new total of 197,445 ac-ft.

If implemented, then the new proposed requirements will have some significant benefits over the current Conference Year requirements. First, the proposed new requirements at the USGS Smartsville gage will be in effect for an additional 45 days during September and the first part of October, and for an additional 15 days during the first part of April. In addition, there will be fewer month-to-month changes in these requirements. At the Marysville gage, the proposed new requirements will be constant from October 1 through March 31, while the current requirements have substantial reductions beginning on January 1. The potential for de-watering of Chinook salmon redds has been studied by YCWA and the RMT during the past 7 years. As a result of these studies, YCWA believes that the proposed, more-constant Conference Year flow requirements for the September through March timeframe (i.e., the spawning and the incubation period for Chinook salmon in the Yuba River) will result in less potential for de-watering of the redds of these salmon than would occur under the current, Yuba Accord Conference Year flow schedules. These new flow schedules also will require an approximately 14 percent increase in the total volume of water that must flow past the Marysville Gage in Conference Years during the November through March period.

Second, for the July through September period, YCWA's proposed Condition AR3 would increase the minimum flows at the Marysville gage from 70 to 150 cfs. These higher flows will require an additional 14,598 ac-ft of water to pass the Marysville gage during these months in

Conference Years, approximately a 114 percent increase for this period. YCWA believes that these higher minimum flows will provide better water temperature conditions in the Yuba River than would occur during Conference Years under the current requirements.[21]

E2.4.4 YCWA's Proposed Condition AR4: Control Project Spills at New Bullards Bar Dam

Licensee shall, beginning in the first full calendar year after license issuance, reduce flows through the New Bullards Bar Dam spillway in the following manner after any spill releases that occur between May 1 and July 31 after water is no longer stored in the Flood Reservation Space above elevation 1,918 feet. For spill events greater than approximately 2,000 cfs, as inflows into the reservoir recede and the spill is at 2,000 cfs and reducing, the spill will be reduced at a target rate of approximately 250 cfs per day[22] until the spill has ceased. If a spill of less than approximately 2,000 cfs occurs, then the spill release will be reduced from the peak spill flow target rate by a target rate of approximately 250 cfs per day until the spill has ceased.

Compliance with this measure will be the adjustments to spillway gate opening to meet the ramping rate as determined by Licensee's calculation of spillway gate release.

Rationale Statement in Support of YCWA's Condition AR4. Condition AR4 would minimize the frequency and magnitude of flow changes that have the potential to adversely affect stream fish populations. YCWA's proposed spill cessation schedule for New Bullards Bar Dam will be in effect from May 1 through July 15 of each year. This period will encompass a significant portion of time during which rainbow trout spawning, incubation and emergence are most likely to occur. As described above, the spill cessation schedule provides for stepped reductions in spills so that down-ramping is gradual while prolonging the total length of time during which each spill event occurs. Condition AR4 will have no foreseeable effect on FYLF because this species is not known to occur downstream of New Bullards Bar Dam.

E2.4.5 YCWA's Proposed Condition AR5: Implement Aquatic Invasive Species Management Plan[23]

Licensee shall, in the first year of the new license term, implement the Aquatic Invasive Species Management Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition AR5. Aquatic invasive species are a potential threat to the Project, and could cause impairments of Project function, as well as impacts to the environment. Implementing YCWA's proposed Aquatic Invasive Species

[21] If the Commission includes YCWA's Proposed Condition AR3 in YCWA's new license, then YCWA will ask the SWRCB to amend the provisions regarding Conference Year flows in YCWA's water-right permits so that they are consistent with the Conference Year requirements in YCWA's new license.
[22] Determined as specified in the Streamflow and Reservoir Level Gaging Plan.
[23] This plan is included in Appendix E3 of Exhibit E of Application for New License.

Management Plan would help prevent the introduction and spread of these species by providing a public education and awareness program; implementing monitoring as an early warning in case of the spread of invasive species; and providing guidelines for Project O&M to prevent the spread of aquatic invasive species.

E2.4.6 YCWA's Proposed Condition AR6: Implement New Bullards Bar Reservoir Fish Stocking Plan[24]

Licensee shall, in the first year of the new license term, implement the New Bullards Bar Reservoir Fish Stocking Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition AR6. New Bullards Bar Reservoir has a legacy of excellent recreational rainbow trout, kokanee (and spotted bass) fishing. This trout and kokanee fishery is in large part due to stocking programs and management as a Put-and-Grow fishery. Without this supplementation of natural production, the fishery and its associated recreational fishing experiences probably would decline. YCWA is committed to providing quality recreational opportunities for the public at New Bullards Bar Reservoir. A fish stocking program to maintain the rainbow trout and kokanee fisheries is an integral element of maintaining those opportunities.

E2.4.7 YCWA's Proposed Condition AR7: Implement Upper Yuba River Aquatic Monitoring Plan[25]

Licensee shall implement the Upper Yuba River Aquatic Monitoring Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition AR7. YCWA's proposed increases in minimum flows and management of spill cessation at Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam, which could affect habitat for resident fish species and FYLF resulting from changes in habitat suitability, water temperature, riparian vegetation, and channel morphology. In addition, YCWA proposes a sediment and LWM pass-through program at Our House and Log Cabin diversion dams, which could also affect habitat for fish species and FYLF. YCWA's Proposed Condition AR7 would periodically monitor stream fish and FYLF at representative locations where they were monitored during relicensing, which would provide a comparison between the distribution, relative abundance, and condition of fish populations and FYLF under pre-license conditions and new license conditions. To facilitate this comparison, Condition AR7 proposes to use the same methods that were used during relicensing, and samples would be taken at the same time of year they were taken during relicensing.

[24] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[25] This plan is included in Appendix E3 of Exhibit E of Application for New License.

With regard to stream fish populations, Condition AR7 provides for sampling at one location each in the Middle Yuba River, Oregon Creek, the North Yuba River and the Yuba River where sampling was done during relicensing. Only four fish species were found during relicensing (i.e., rainbow trout, smallmouth bass, Sacramento sucker and Sacramento pikeminnow) in this transitional fishery area, and summertime water temperatures and flows in at least the Middle Yuba River and Oregon Creek, will continue to be as they were – low and warm (i.e., exceed 20°C).[26] So, a significant change in the transitional fish population is not expected.

YCWA's relicensing studies found FYLF at few locations. As discussed above, because summertime conditions under the new license are not expected to be significantly different, YCWA proposes FYLF sampling at the monitoring sites once in the first year of the new license. Monitoring in the fifth and tenth year of the new license and then every 10 years is adequate to determine if changes in the new license have adversely affected FYLF.

Since YCWA proposes to pass sediment through Our House and Log Cabin Diversion dams and excavate sediment as needed from those impoundments, YCWA's proposed Condition AR7 includes channel morphology and riparian vegetation monitoring at co-located sites that were sampled during relicensing. Monitoring would occur following the first time the low level outlet in the dam is opened for the purposes of sediment passage, as described in YCWA's proposed Condition GS2, and then following every fifth year the dam low level outlet is opened for the purposes of sediment passage.

In addition, Condition AR7 includes channel morphology and riparian vegetation monitoring in the North Yuba River below New Bullards Bar Dam at co-located sites that were sampled during relicensing at the same frequency as for stream fish and FYLF monitoring.

YCWA's Proposed Condition AR7 would provide for continuous monitoring or water temperature and periodic monitoring of water quality (i.e., same frequency as for stream fish and FYLF) downstream of Our House, Log Cabin and New Bullards Bar dams to determine if conditions in the new license have adversely affected the environment.

YCWA's Proposed Condition AR7 also includes incidental observations, especially for western pond turtle (WPT) and American bullfrog. Specific surveys for WPT are not proposed because no WPT were observed during relicensing downstream of the dams. In addition, specific surveys are not needed because it is unlikely that WPT would be affected by Project O&M activities. Nesting and hatching success, key factors affecting the success of populations of western pond turtles that occur in terrestrial habitat, would not be affected by changes in Project flows and riparian habitat. In addition, effective survey methods for identification of nesting sites have not been developed; and focused surveys for WPT in the Project boundary are not likely to provide any more information than incidental observations.

[26] Water temperatures in these streams exceed 20°C for most of the summer under current conditions, which are normally inflow equals outflow from Our House and Log Cabin diversion dams. Since these facilities do not store water, conditions under the new license will also likely be inflow equals outflow, resulting in water temperatures over 20°C.

The plan provides for reports in years that monitoring occurs, review of those reports with agencies, and filing the reports with the Commission.

The monitoring schedules are reasonable. Monitoring in the first year of the new license, in conjunction with the relicensing information collected by YCWA, will establish a baseline for comparison with monitoring in later years. Monitoring in fifth and tenth year of the new license will show if the condition has any adverse effects. More frequent monitoring is not needed because the intent is not to do a research study on stream fish populations, FYLF, water quality, water temperature, channel morphology or riparian vegetation, but to reasonably assess whether the proposed Project adversely effects the environment using the monitoring data and the relicensing dates.

E2.5 Terrestrial Resources

E2.5.1 YCWA's Proposed Condition TR1: Implement Integrated Vegetation Management Plan[27, 28]

Licensee shall, in the first year of the new license term, implement the Integrated Vegetation Management Plan (IVMP) included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition TR1. Integrating vegetation management activities under one comprehensive plan will result in better control of NNIPs, with better communication and coordination. YCWA's proposed Integrated Vegetation Management Plan contains provisions for NNIP management, re-vegetation, routine vegetation management and sensitive resource protection. Currently, 14 NNIPs are known to occur in the Project Area. Many of the weed species are documented as aggressive invaders that displace native plants and disrupt natural habitats. Project O&M activities, such as road grading and vegetation control, may increase the spread of NNIPs. YCWA believes that the additional components of this condition, including NNIP removal, monitoring, and re-vegetation, will prevent the further spread of NNIPs and improve the overall environment. Implementing revegetation and sensitive resource protection will also help protect and improve the environment, while allowing continued Project O&M throughout the term of the license. Approaching these activities with a coordinated team approach is efficient and reduces risk of unintended environmental impacts.

[27] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[28] This condition overlaps in part with Articles 20 and 26 in FERC's Form-L5 Standard Articles.

E2.5.2 YCWA's Proposed Condition TR2: Implement Bald Eagle and American Peregrine Falcon Management Plan[29]

Licensee shall, in the first year of the new license term, implement the Bald Eagle and American Peregrine Falcon Management Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition TR2. Bald eagles have nested at New Bullards Bar Reservoir for more than 20 years. During this period, their protection has been accomplished through various agreements between YCWA, the Forest Service and USFWS (e.g., the USFWS 2004 BiOp and Closure of Tractor Cove). YCWA's proposed Bald Eagle and American Peregrine Falcon Management Plan is intended to consolidate protective measures, such as closures and LOPs, into a single document in order to address Project effects. YCWA believes that this condition will promote the continued use of the Garden Point by reducing disturbances associated with Project O&M and recreation. The condition also affords protection to any new nests constructed within or adjacent to the Project Area. In addition to bald eagles, the plan sets forth protective measures such as surveys and LOPs for recently reported and any new American peregrine falcon nests in or adjacent to the FERC Project Boundary.

E2.5.3 YCWA's Proposed Condition TR3: Implement Ringtail Management Plan[30, 31, 32]

Licensee shall, in the first year of the new license term, implement the Ringtail Management Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition TR3. Ringtail has been assigned the status of a Fully Protected Mammal under Cal Fish and Game Code Section 4700. Due to this status, ringtail is afforded the greatest protection prescribed to wildlife in California. Recent instances have occurred where ringtails have accessed the interior of Project powerhouses. In response, YCWA proposes a Ringtail Management Plan, which provides guidance for the exclusion of ringtail from Project facilities. Exclusion of ringtail will help to ensure YCWA's compliance with the protective status of this species in California.

[29] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[30] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[31] On April 2, 2014, the USFWS and Cal Fish and Wildlife advised YCWA via e-mail that each agency agreed to this Ringtail Management Plan.
[32] On April 2, 2014, YCWA, USFWS and Cal Fish and Wildlife each stated it "could live with" this plan (i.e., YCWA staff would recommend to its Board that the plan be included unchanged from the plan that was agreed to in YCWA's FLA, which it has been; USFWS staff said it would recommend to its management that the plan be include unchanged in USFWS' FPA Section 10(j) recommendations; and Cal Fish and Wildlife staff said it would recommend to its management that the plan be include unchanged in Cal Fish and Wildlife's FPA Section 10(j) recommendations). If each agency does not do this, YCWA reserves it s right to file a revised plan since the plan included in this FLA was a negotiated plan.

E2.5.4 YCWA's Proposed Condition TR4: Implement Bat Management Plan[33]

Licensee shall, within the first year of the new license term, implement the Bat Management Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of Condition TR4. Various bat species are known to occur throughout the Project Area, and they can be found utilizing Project facilities as night roosts and day roosts. While this generally does not create an issue, bats occasionally occupy areas where staff has routine presence, which could lead to human bat interactions. Such interactions could result in the unnecessary exposure of staff to diseases such as rabies or unnecessary disturbances to roosting bats. Implementation of YCWA's proposed condition to manage bats at Project facilities by exclusion would reduce the likelihood of such interactions, thus protecting staff and roosting bats.

E2.6 ESA-Listed Threatened and Endangered Species

E2.6.1 YCWA's Proposed Condition TE1: Monitor Water Temperatures Downstream of Narrows 2 Powerhouse[34]

Licensee shall, in the first 90 days of the new license term, install, maintain in proper functioning condition, and operate five water temperature monitoring recorders, one each at a suitable site at or near the following locations in the Yuba River: 1) the existing USGS Smartsville streamflow gaging station (USGS Gaging Station1141800); 2) the existing USGS Marysville streamflow gaging station (USGS Gaging Station 1142100); 3) in the pool upstream of Daguerre Point Dam; and two loggers in the Feather River, one upstream and one downstream of the confluence with the Yuba River, to be located at existing USGS streamflow gaging stations. Each recorder shall be placed in the active channel and monitor water temperature on an hourly basis, and shall have a minimum accuracy of ±0.2º Celsius. Licensee shall download water temperature data at least every 3 months, perform a quality assurance/quality control review of the data, and post the reviewed hourly water temperature data to a publically available website within 30 days of downloading the data.

Rationale Statement in Support of YCWA's Condition TE1. YCWA has collected water temperature data for the Yuba River downstream of Narrows 2 Powerhouse for several years as required by SWRCB decisions and orders. These data have been useful in many venues, particularly the Monitoring and Evaluation studies conducted as part of the Yuba Accord. YCWA proposes to continue this data collection.

[33] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[34] This proposed condition is similar to the term that was added to YCWA's water-right permits by the SWRCB's Revised Decision 1644, adopted on July 16, 2003. (See RD-1644, p. 178, term 2(d).)

E2.6.2 YCWA's Proposed Condition TE2: Monitor Chinook Salmon Downstream of Narrows 2 Powerhouse

Beginning upon license issuance and continuing through the fourth full year of the new license term, Licensee shall each year operate continuously an infrared and/or camera-based monitoring device (e.g., VAKI Riverwatcher™ systems) in each of the North and South fish ladders at Daguerre Point Dam. Based on the data produced by the monitoring devices, Licensee shall estimate number, size and timing of Chinook salmon and *Oncorhynchus mykiss* passing through the ladders. Data shall undergo a quality assurance/quality control review in consultation with the Lower Yuba Anadromous Fish Ecological Group (Group) described in Licensee's proposed Condition TE3. Beginning in the fifth full year of the new license term and annually thereafter, Licensee shall monitor Chinook salmon and *O. mykiss* immigration into the Yuba River using an infrared or camera-based monitoring device, or such other technology as may be developed in consultation with the Group.

In addition, beginning upon license issuance and continuing through the fourth full year of the new license term, Licensee shall monitor Chinook salmon escapement each year from September 1 through January 31 (weather and river conditions permitting) by conducting weekly mark-recapture carcass surveys in the Yuba River from Daguerre Point Dam to the Simpson Lane Bridge. All fresh carcasses observed shall be sampled. All sampled carcasses (adipose fin-clipped and non-clipped) shall be tagged for abundance estimation from the mark-recapture surveys. The following data shall be collected from each fresh carcass: 1) sex; 2) fork length in millimeters; 3) if a female carcass, egg retention status; 4) adipose fin presence; and 5) location where the fish was observed, in Global Positioning System coordinates. For adipose-fin clipped fish, heads may be collected, if coded wire tagging (CWT) recovery is desired by the Group. Estimation of the escapement from the mark-recapture carcass surveys shall use the super-population modification of the Cormack Jolly-Seber model. Beginning in the fifth year of the new license term and annually thereafter, Licensee shall monitor escapement using the mark-recapture method described above unless an alternative method is adopted in consultation with the Group.

By May 30 of each year, Licensee shall file with the Commission an annual monitoring report for the previous monitoring year. The report shall include objectives, methods and results sections and shall include raw data in appendices and an estimate of total annual escapement.

Rationale Statement in Support of YCWA's Condition TE2. As described previously for Condition AR3, the Yuba Accord required YCWA to establish a RMT to evaluate the implementation of the Accord. YCWA has funded a monitoring plan for the lower Yuba River since 2007. As part of the RMT's study work, the RMT utilized funding from YCWA to take charge of studies initiated by Cal Fish and Wildlife and USFWS; specifically, the RMT took over responsibility for operations of the VAKI Riverwatcher™ system and escapement surveys. YCWA and the RMT have consistently found these efforts highly valuable across a range of year type and data analysis needs. YCWA proposes to continue these data collection activities.

E2.6.3 YCWA's Proposed Condition TE3: Establish Lower Yuba River Anadromous Fish Ecological Group

Licensee shall, within the first 6 months of the new license term, establish the Lower Yuba River Anadromous Fish Ecological Group (Group), whose members shall include Licensee, NMFS, USFWS, Cal Fish and Wildlife, BLM and SWRCB. The purpose of the Group shall be to consult with Licensee regarding implementation of the terms and conditions of the new license that pertain to anadromous fish in the lower Yuba River downstream of Narrows 2 Powerhouse, to review study protocols for Licensee's studies of anadromous fish downstream of Narrows 2 powerhouse, and to consult with Licensee on specific operational issues related to flow changes in the reach downstream of Narrows 2 powerhouse as requested by Licensee. Licensee shall organize at least one meeting in April and up to three additional meetings each year with the Group. The purpose of the April meeting shall be to discuss water temperature and salmonid escapement data from the previous year developed pursuant to Licensee's proposed Conditions TE1 and TE2. By May 30 of each year, Licensee shall file with the Commission an annual report of the activities of the Group for the previous calendar year.

Rationale Statement in Support of YCWA's Condition TE3. As described previously for Conditions AR3, the Yuba Accord charged YCWA with establishing a RMT to evaluate the implementation of the Yuba Accord. In addition to evaluating the efficacy of the Yuba Accord flow schedules, the RMT provided valuable insights and comments on proposed YCWA operations and flow change decisions that impact flows in the Yuba River downstream of Englebright Dam. YCWA proposes that a group be established to both review the data collection results from Condition TE1 and TE2 and to continue to provide insights on proposed Project operations and flow change decisions that impact flows in the lower Yuba River.

E2.6.4 YCWA's Proposed Condition TE4: Control Project Ramping and Flow Fluctuation Downstream of Englebright Dam

This condition does not apply to Project operations during emergencies, releases required by USACE's flood control criteria, releases required to maintain a flood control buffer or for other flood control purposes, bypasses of uncontrolled flows into Englebright Reservoir, or times when Englebright Dam is spilling. When this condition applies, Licensee shall make reasonable efforts to operate New Bullards Bar Reservoir and Project facilities downstream of Englebright Dam and coordinate with the operator of the Narrows Project (FERC Project No. 1403) to avoid fluctuations in the flow of the Yuba River downstream of Englebright Dam and daily changes in Project operations affecting releases or bypasses of flow downstream of Englebright Dam shall be continuously measured at USGS Smartsville Streamflow Gage 11418000 and made in accordance with the following conditions:

- To minimize the potential for spring-run Chinook salmon redd dewatering, during the period from September 2 through December 31 (corresponding to the spring-run Chinook salmon spawning and incubation period), Licensee shall not reduce the flow downstream of Englebright Dam to less than the larger of: 1) the applicable minimum streamflow requirement specified in YCWA's Proposed Condition AR3; or 2) the flow that would

result from applying the maximum flow reduction amount specified in Table 1 of this condition corresponding to the base flow range determined using the maximum 5-day average flow that occurred on days when this condition was in effect during that September 2 through December 31 period. During the period of September 2 through 5, the base flow range shall be determined by the average daily flow on September 1.

- To minimize the potential for steelhead redd dewatering, during the period from January 1 through May 31 (corresponding to the steelhead spawning and incubation period), Licensee shall not reduce the flow downstream of Englebright Dam to less than the larger of: 1) the applicable minimum streamflow requirement specified in YCWA's Proposed Condition AR3; or 2) the flow that would result from applying the maximum flow reduction amount specified in Table 2 of this condition corresponding to the base flow range determined using the maximum 5-day average flow that occurred on days when this condition was in effect during that January 1 through May 31 period. During the period of January 1 through 5, the base flow range shall be determined by the average daily flow on December 31. If this condition was not in effect on December 31, then the base flow range shall be the minimum flow authorized under the preceding paragraph on the latest date on which this condition was in effect. During the period from April 1 through May 31 when Flow Schedules 3 through 6 or Conference Years are in effect specified in YCWA's Proposed Condition WR3, Licensee may reduce the flow downstream of Englebright Dam to the applicable minimum streamflow requirement specified in YCWA's Proposed Condition AR3.
- To minimize the potential for salmonid fry and juvenile stranding year-round, streamflow downstream of Englebright Dam:
  - shall not exceed a rate of increase of more than 500 cfs per hour, nor a rate of decrease of more than 200 cfs per hour, measured at the beginning of each hour of the day;
  - shall not vary up or down by more than 15 percent of the average daily flow due to changes in Project operations, once the daily Project release is achieved; and
  - shall not be reduced to a daily average flow of less than 70 percent of the prior day's average daily flow.

Table 1. Maximum flow reductions corresponding to the maximum average release (Base Flow) that has occurred during the period extending from September 1 through December 31.

Base Flow Range (cfs)	Maximum Flow Reduction (cfs)
450 – 549	200
550 - 849	250
850 - 1049	300
1,050 – 1,349	350
1,350 – 1,599	400
1,600 – 1,849	450
1,850 – 2,199	500
2,200 – 2,549	550
2,550 – 2,899	600
2,900 – 3,199	650
3,200 – 3,549	700
3,550 – 4,130	750

Table 2. Maximum flow reductions corresponding to the maximum average release (Base Flow) that has occurred during the period extending from January 1 through May 31.

Base Flow Range (cfs)	Maximum Flow Reduction (cfs)
450 - 499	200
500 - 549	250
550 - 649	300
650 - 849	350
850 – 1,199	400
1,200 – 1,449	450
1,450 – 1,699	500
1,700 – 1,899	550
1,900 – 2,149	600
2,150 – 2,399	650
2,400 – 2,699	700
2,700 – 2,949	750
2,950 – 3,199	800
3,200 – 3,450	850
3,450 – 3,899	900
3,900 – 4,130	950

Rationale Statement in Support of YCWA's Condition TE4. For the reasons stated below, Licensee proposes that this condition be included in the new license. This condition is expected to minimize potential Project effects related to flow ramping and flow fluctuations on salmonids in the Yuba River downstream of Englebright Dam.

The maximum flow reductions possible for each flow range specified in Table 1 and Table 2 were developed by identifying the resultant decreased flow levels that would result in no more than 1.0 percent of expected spring-run Chinook salmon and steelhead redds being dewatered, respectively, using known spatial and depth distributions of spring-run Chinook salmon and steelhead redds and morphological unit-specific stage-discharge relationships (See Section 6 of the Applicant-Prepared Draft Biological Assessment). Because fall-run Chinook salmon spawning and embryo incubation extends from October 1 through March 31, Conditions 1 and 2, which would restrict flow reductions during the spring-run Chinook salmon and steelhead spawning and embryo incubation periods, also would restrict flow reductions during the fall-run Chinook salmon spawning and embryo incubation period in the Yuba River downstream of Englebright Dam. Therefore, no additional conditions are proposed for fall-run Chinook salmon.

Studies conducted in the Yuba River downstream of Englebright Dam found no relationship between ramping rates in the lower Yuba River and the incidence of fry stranding on low gradient bars ("beaching") within the observed range of ramping rates (flow reductions of 100 to 200 cfs per hour at Narrows 2 Powerhouse) (B. Mitchell, ICF/JSA, pers. comm. 2012). Surveys conducted by YCWA indicate that the small size and strong association of young fry with substrates limit their ability to detect or respond to receding water levels, regardless of ramping rate. This finding is supported by Woodin (1984), who determined that any daytime ramping resulted in stranded Chinook salmon fry in Washington's Skagit River, and by Beck Associates (1989), who found no correlation between ramping rate and steelhead fry stranding during the summer in the Skagit River (WDF 1992).

Flow ramping rates of 100 to 200 cfs corresponded to changes in stage of 0.4 to 1 inch per hour at the study sites in the lower Yuba River (B. Mitchell, ICF/JSA, pers. comm. 2012), well within

the rates of stage change considered to be protective of juvenile salmonids. A rate of 1 inch per hour is generally within the range of natural rates of stage reductions in unregulated rivers (Olson and Metzgar 1987), while Higgins and Bradford (1996) state that maximum recommended stage reduction levels for gravel bars of regulated rivers are typically 2.5–5 cm (1-2 inches) per hour (Sommer et al. 2005). Therefore, a rate of flow reduction associated with Project releases or bypasses downstream of Englebright Dam of 200 cfs per hour would minimize the potential for fry stranding in the Yuba River downstream of Englebright Dam.

E2.7 Recreation Resources

E2.7.1 YCWA's Proposed Condition RR1: Implement Recreation Facilities Management Plan[35, 36]

Licensee shall, within the first year of the new license term, implement the Recreation Facilities Management Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition RR1. Overall, implementation of the Recreation Facilities Plan will provide enhanced recreation opportunities while also minimizing recreation-use impacts to natural, historic, and prehistoric resources within the Project Area. As such, the plan includes the following objectives to help achieve these goals: 1) to provide recreation facilities that meet the needs of Project recreation users consistent with federal, state, and local legal requirements and guidelines; 2) to monitor recreation use over the term of the license to help ensure Project recreation users enjoy high quality recreation experiences and that recreation use impacts are minimized and remain within acceptable limits; and 3) to describe YCWA's responsibilities regarding recreation facilities and monitoring under the new license.

More specifically, recreation use of Project facilities during the existing license term has resulted in some facilities that need near-term rehabilitation, and the Plan has measures to address these near-term issues and improve the recreation experience and provide new and safe facilities for the public (e.g., aging recreational water supply delivery system, septic systems and restroom facilities). Further, the existing recreation facilities will need major rehabilitation (most within 10 years of the new license) and the Plan addresses when and how YCWA will rehabilitate the facilities to continue to provide safe, quality recreation opportunities for the public.

Beyond the existing recreation use impacts, over the term of the new license recreation use/demand is expected to increase by as much as 50 percent, which YCWA has addressed in the Plan by providing incremental expansion of existing recreation facilities to provide for near-term recreation growth. However, a critical element of recreation use at the Project is boating on New Bullards Bar Reservoir, which has an established carrying capacity and must be carefully monitored and considered as recreation demand increases and causes potential pressures for

[35] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[36] This condition overlaps in part with Articles 17 and 18 in FERC's Form-L5 Standard Articles.

additional facilities (i.e., campgrounds, boat launch parking, etc.). In order to ensure that reservoir boating remains as a high quality opportunity and experience at the Project, YCWA has developed a monitoring program in the Plan to 1) ensure that the reservoir boating carrying capacity is monitored and 2) to determine if any future expansions or new developments are suitable at the Project and New Bullards Bar Reservoir in particular.

Finally, since the vast majority of the existing Project recreation facilities are located on NFS land, it is critical for YCWA to meet Forest Service standards and also regularly consult/coordinate with the Forest Service to operate the recreation facilities and continue to provide high quality recreation facilities and opportunities for the public. The Plan specifically addresses how and when YCWA will meet and/or consult with the Forest Service over the license term.

E2.7.2 YCWA's Proposed Condition RR2: Provide Recreation Flow Information

Licensee shall, beginning as soon as reasonably feasible but not later than one year after license issuance, make the following stream flow information available to the public:

- Middle Yuba River downstream of Our House Diversion Dam
- Oregon Creek downstream of Log Cabin Diversion Dam
- North Yuba River downstream of New Bullards Bar Dam
- Yuba River at Smartsville Gage
- Yuba River at Marysville Gage

The streamflow information will be from the streamflow gage downstream of the facility used to document compliance with flow requirements in the reach (see YCWA's Proposed Condition WR4). If that gage is not USGS rated above the compliance flow, Licensee shall make a good faith effort to estimate the flow above the USGS rating. The flow information shall be made available to the public on a real-time basis via the Internet; the publication of the information may be accomplished through a third party, such as the California Data Exchange Center. The preference is that data shall be reported in 15-minute intervals; however, data that is reported no less than in hourly intervals is acceptable. It is understood this information will be provisional and subject to change because it will not have undergone a quality assurance or quality control review before it is made available to the public.

Rationale Statement in Support of YCWA's Condition RR2. There is existing demand for recreational opportunities in the Project affected reaches and over the license term Licensee anticipates continued demand in Project affected stream reaches. Providing real-time flow information will allow recreationists to identify if there are suitable, opportunistic flows for their activities; and the information will help them to better plan their recreation trips.

E2.8 Land Use

E2.8.1 YCWA's Proposed Condition LU1: Implement Transportation System Management Plan[37]

Licensee shall, within the first year of the new license term, implement the Transportation System Management Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition LU1. YCWA's proposed Transportation System Management Plan provides guidance for the rehabilitation and maintenance of Primary Project Roads and Trails. Primary Project Roads and Trails are non-general use roads and trails, used primarily for the Project and are located within the FERC Project Boundary (and therefore will be under FERC's jurisdiction for the Proposed Project). General Access Roads are general use roads that are outside the FERC Project Boundary. YCWA has consulted with the Forest Service to determine which roads on NFS land are Primary Project Roads and which roads are General Access Roads. In addition, if a road providing primary access to Project facilities is a county road, it is included in a Road Maintenance Agreement (agreement) between YCWA and Yuba County. The agreement not jurisdictional to the FERC license and is intended to remain as a separate agreement between YCWA and Yuba County that generally addresses shared responsibilities and funding. The agreement is presently being negotiated by YCWA and Yuba County and is consistent with the Primary Project Roads and Trails list and related technical memorandum. All Primary Project Roads are included in the Transportation System Management Plan for Primary Project Roads and described in Table 3.3.7-11, Section 3.3.7 (Land Use) of Exhibit E of this Application for New License. As a reference, the CSA county roads are also listed in Table 3.3.7-11, Section 3.3.7 (Land Use) of Exhibit E of this FLA.

E2.8.2 YCWA's Proposed Condition LU2: Implement Fire Prevention and Response Plan[38, 39, 40]

Licensee shall, within the first year of the new license term, implement the Fire Prevention and Response Plan included in Licensee's application for new license, as approved by the Commission.

[37] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[38] This plan is included in Appendix E3 of Exhibit E of Application for New License.
[39] This condition overlaps in part with Article 28 in FERC's Form-L5 Standard Articles.
[40] On April 9, 2014, YCWA, the Forest Service and Cal Fish and Wildlife each stated it "could live with" this plan (i.e., YCWA staff would recommend to its Board that the plan be included unchanged from the plan that was agreed to in YCWA's FLA, which it has been; the Forest Service staff said it would recommend to its management that the plan be include unchanged in the Forest Service's preliminary FPA Section 4(e) conditions; and Cal Fish and Wildlife staff said it would recommend to its management that the plan be include unchanged in Cal Fish and Wildlife's FPA Section 10(j) recommendations). If each agency does not do this, YCWA reserves it s right to file a revised plan since the plan included in this FLA was a negotiated plan.

Rationale Statement in Support of YCWA's Condition LU2. YCWA's proposed Fire Prevention and Response Plan would, among other things: provide a mechanism for preventing and reporting wildfires to appropriate agencies; provide information on fire ignition sources in the Project area; and provide for cooperation between YCWA and appropriate agencies for investigating fires that may be related to Project O&M.

E2.9 Cultural Resources

E2.9.1 YCWA's Proposed Condition CR1: Implement Historic Properties Management Plan[41]

Licensee shall, in the first year of new license term, implement the Historic Properties Management Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition CR1. The purpose of YCWA's HPMP is to prescribe specific actions and processes to manage historic properties within the Project APE. It is intended to serve as a guide for YCWA's operating personnel when performing necessary O&M activities and to prescribe site treatments designed to address ongoing and future effects to NRHP-eligible historic properties. The HPMP also describes a process of consultation with appropriate state and federal agencies, as well as with Indian tribes who may have interests in historic properties within the Project APE. YCWA's requirements detailed in the HPMP include: management measures; training for all O&M staff; routine monitoring of known cultural resources and, periodic review and revision of the HPMP.

As described in the Application for New License, YCWA plans to complete consultation regarding the HPMP and file with FERC a final HPMP in its FLA. YCWA anticipates that FERC would then execute a Programmatic Agreement (PA) with SHPO and with the ACHP, should it choose to participate, to implement the HPMP. YCWA, Indian tribes and the Forest Service may be invited by FERC to participate in the PA as consulting parties.

[41] This plan is included in Volume V of Application for New License, and is considered Privileged.

E2.10 Aesthetic Resources

E2.10.1 YCWA's Proposed Condition VR1: Implement Visual Resources Management Plan[42, 43]

Licensee shall, within the first year of the new license term, implement the Visual Resources Management Plan included in Licensee's application for new license, as approved by the Commission.

Rationale Statement in Support of YCWA's Condition VR1. YCWA's proposed Visual Resources Management Plan would reduce the visual contrast of some Project facilities. The plan provides a schedule for when mitigation measures would be implemented and provides direction on how to address visual impacts from modifications to the Project that are not covered under the FERC license and are located on NFS land.

E2.11 Socioeconomic Resources

YCWA's proposed Project does not include conditions specifically related to socioeconomic resources.

E2.12 Air Quality

YCWA's proposed Project does not include conditions specifically related to air resources.

E2.13 Noise

YCWA's proposed Project does not include conditions specifically related to noise.

[42] This plan is included in Appendix E3 of Exhibit E of Application for New License.

[43] On March 10, 2014, YCWA, the Forest Service and Cal Fish and Wildlife each stated it "could live with" this plan (i.e., YCWA staff would recommend to its Board that the plan be included unchanged from the plan that was agreed to in YCWA's FLA, which it has been; the Forest Service staff said it would recommend to its management that the plan be include unchanged in the Forest Service's preliminary FPA Section 4(e) conditions; and Cal Fish and Wildlife staff said it would recommend to its management that the plan be include unchanged in Cal Fish and Wildlife's FPA Section 10(j) recommendations). If each agency does not do this, YCWA reserves it s right to file a revised plan since the plan included in this FLA was a negotiated plan.

Page Left Blank

ATTACHMENT 1
TO APPENDIX E2

Form L-5
(October, 1975)

FEDERAL ENERGY REGULATORY COMMISSION

TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED MAJOR PROJECT AFFECTING NAVIGABLE WATERS AND LANDS OF THE UNITED STATES

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project area and project works shall be in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Article 4. The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and supervision of the Regional Engineer,

Federal Energy Regulatory Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him such information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and shall notify him of the date upon which work with respect to any alteration will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall submit to said representative a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of any such alterations to the project. Construction of said alterations or any feature thereof shall not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights or occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a nonpower licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee,

to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

Article 7. The actual legitimate original cost of the project and of any addition thereto or betterment thereof shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 10. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 11. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of

making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

Article 12. The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission my prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 14. In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and

operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 17. The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All

clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 21. Material may be dredged or excavated from, or placed as fill in, project lands and/or waters only in the prosecution of work specifically authorized under the license; in the maintenance of the project; or after obtaining Commission approval, as appropriate. Any such material shall be removed and/or deposited in such manner as to reasonably preserve the environmental values of the project and so as not to interfere with traffic on land or water. Dredging and filling in a navigable water of the United States shall also be done to the satisfaction of the District Engineer, Department of the Army, in charge of the locality.

Article 22. Whenever the United States shall desire to construct, complete, or improve navigation facilities in connection with the project, the Licensee shall convey to the United States, free of cost, such of its lands and rights-of-way and such rights of passage through its dams or other structures, and shall permit such control of its pools, as may be required to complete and maintain such navigation facilities.

Article 23. The operation of any navigation facilities which may be constructed as a part of, or in connection with, any dam or diversion structure constituting a part of the project works shall at all times be controlled by such reasonable rules and regulations in the interest of navigation, including control of the level of the pool caused by such dam or diversion structure, as may be made from time to time by the Secretary of the Army.

Article 24. The Licensee shall furnish power free of cost to the United States for the operation and maintenance of navigation facilities in the vicinity of the project at the voltage and frequency required by such facilities and at a point adjacent thereto, whether said facilities are constructed by the Licensee or by the United States.

Article 25. The Licensee shall construct, maintain, and operate at its own expense such lights and other signals for the protection of navigation as may be directed by the Secretary of the Department in which the Coast Guard is operating.

Article 26. Timber on lands of the United States cut, used, or destroyed in the construction and maintenance of the project works, or in the clearing of said lands, shall be paid for, and the resulting slash and debris disposed of, in accordance with the requirements of the agency of the United States having jurisdiction over said lands. Payment for merchantable timber shall be at current stumpage rates, and payment for young growth timber below merchantable size shall be at current damage appraisal values. However, the agency of the United States having jurisdiction may sell or dispose of the merchantable timber to others than the Licensee: Provided, that timber so sold or disposed of shall be cut and removed from the area prior to, or without undue interference with, clearing operations of the Licensee and in coordination with the Licensee's project construction schedules. Such sale or disposal to others shall not relieve the Licensee of responsibility for the clearing and disposal of all slash and debris from project lands.

Article 27. The Licensee shall do everything reasonably within its power, and shall require its employees, contractors, and employees of contractors to do everything reasonably within their power, both independently and upon the request of officers of the agency concerned, to prevent, to make advance preparations for suppression of, and to suppress fires on the lands to be occupied or used under the license. The Licensee shall be liable for and shall pay the costs incurred by the United States in suppressing fires caused from the construction, operation, or maintenance of the project works or of the works appurtenant or accessory thereto under the license.

Article 28. The Licensee shall interpose no objection to, and shall in no way prevent, the use by the agency of the United States having jurisdiction over the lands of the United States affected, or by persons or corporations occupying lands of the United States under permit, of water for fire suppression from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license, or the use by said parties of water for sanitary and domestic purposes from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license.

Article 29. The Licensee shall be liable for injury to, or destruction of, any buildings, bridges, roads, trails, lands, or other property of the United States, occasioned by the construction, maintenance, or operation of the project works or of the works appurtenant or accessory thereto under the license. Arrangements to meet such liability, either by compensation for such injury or destruction, or by reconstruction or repair of damaged property, or otherwise, shall be made with the appropriate department or agency of the United States.

Article 30. The Licensee shall allow any agency of the United States, without charge, to construct or permit to be constructed on, through, and across those project lands which are lands of the United States such conduits, chutes, ditches, railroads, roads, trails, telephone and power lines, and other routes or means of transportation and communication as are not inconsistent with the enjoyment of said lands by the Licensee for the purposes of the license. This license shall not be construed as conferring upon the Licensee any right of use, occupancy, or enjoyment of the lands of the United States other than for the construction, operation, and maintenance of the project as stated in the license.

Article 31. In the construction and maintenance of the project, the location and standards of roads and trails on lands of the United States and other uses of lands of the United States, including the location and condition of quarries, borrow pits, and spoil disposal areas, shall be subject to the approval of the department or agency of the United States having supervision over the lands involved.

Article 32. The Licensee shall make provision, or shall bear the reasonable cost, as determined by the agency of the United States affected, of making provision for avoiding inductive interference between any project transmission line or other project facility constructed, operated, or maintained under the license, and any radio installation, telephone line, or other communication facility installed or constructed before or after construction of such project

transmission line or other project facility and owned, operated, or used by such agency of the United States in administering the lands under its jurisdiction.

Article 33. The Licensee shall make use of the Commission's guidelines and other recognized guidelines for treatment of transmission line rights-of-way, and shall clear such portions of transmission line rights-of-way across lands of the United States as are designated by the officer of the United States in charge of the lands; shall keep the areas so designated clear of new growth, all refuse, and inflammable material to the satisfaction of such officer; shall trim all branches of trees in contact with or liable to contact the transmission lines; shall cut and remove all dead or leaning trees which might fall in contact with the transmission lines; and shall take such other precautions against fire as may be required by such officer. No fires for the burning of waste material shall be set except with the prior written consent of the officer of the United States in charge of the lands as to time and place.

Article 34. The Licensee shall cooperate with the United States in the disposal by the United States, under the Act of July 31, 1947, 61 Stat. 681, as amended (30 U.S.C. sec. 601, et seq.), of mineral and vegetative materials from lands of the United States occupied by the project or any part thereof: Provided, That such disposal has been authorized by the Commission and that it does not unreasonably interfere with the occupancy of such lands by the Licensee for the purposes of the license: Provided further, That in the event of disagreement, any question of unreasonable interference shall be determined by the Commission after notice and opportunity for hearing.

Article 35. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of non-power facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 36. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 37. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

Page Left Blank