
State Water Resources Control Board

PUBLIC COMMENT PERIOD FOR DRAFT WATER QUALITY CERTIFICATION

MERCED IRRIGATION DISTRICT'S MERCED RIVER HYDROELECTRIC PROJECT FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 2179 AND MERCED FALLS HYDROELECTRIC PROJECT FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 2467

To: Interested Parties Mailing List

Pursuant to section 401 of the federal Clean Water Act, the State Water Resources Control Board (State Water Board or Board) has released a draft water quality certification (certification) for the Merced River Hydroelectric Project and Merced Falls Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project Nos. 2179 and 2467, respectively. The State Water Board is providing this opportunity for public review and comment on the draft certification.

Background

Merced Irrigation District (Merced ID) owns and operates the Merced River Hydroelectric Project (Merced River Project) and the Merced Falls Hydroelectric Project (Merced Falls Project) (collectively, Merced Projects). Merced ID is seeking new licenses from FERC for continued operation of the Merced Projects, which requires Merced ID to obtain certification from the State Water Board that operation of the Merced Projects will be protective of water quality and comply with water quality standards and other requirements of state law. On April 15, 2024, Merced ID submitted requests for certification for the Merced Projects to the State Water Board.

Brief Description of Merced Projects

The Merced Projects are located in the Merced River watershed, in Merced and Mariposa counties, California. The majority of the Merced Projects' facilities are located on federal land administered by the United States Department of Interior, Bureau of Land Management as part of the Sierra Resource Management Area. The major components of the Merced Projects include two reservoirs, one impoundment, three powerhouses, various access roads, and other appurtenant facilities. The Merced River Project has an authorized installed capacity of 101.25 megawatts and the Merced Falls Project has an authorized installed capacity of 3.4 megawatts. Additional background on the Merced Projects can be found in Appendix A of the draft water quality certification.

Water Quality Certification

In California, the State Water Board is responsible for protecting the State's water quality, including through issuance of certification under Section 401 of the Clean Water Act. Certification must ensure compliance with water quality standards and other appropriate requirements of state law, such as water quality control plan standards. A

certification is required before FERC can issue a license for a project. If the State denies certification, FERC cannot issue a license for the project. If the State issues a certification with conditions, those conditions become conditions of the federal license.

Opportunity for Public Comment

This draft certification does not constitute final action by the State Water Board on Merced ID's requests for certification of the Merced Projects. The State Water Board is releasing this draft certification to provide the public with an opportunity to review and comment on draft conditions developed to protect water quality and beneficial uses. The comment period for the draft certification is from the date of this notice until February 28, 2025. **Comments on the draft certification must be received by 12:00 pm (noon) on Friday, February 28, 2025**, and can be submitted electronically (preferred) or by mail as follows:

Email (preferred):
WR401Program@waterboards.ca.gov

or

Mail:
State Water Resources Control Board
Division of Water Rights – Water Quality Certification Program
Attn. Bryan Muro
P.O. Box 2000
Sacramento, CA 95812-2000

The draft certification for the Merced Projects and additional information regarding the State Water Board's certification process for the project are available on the [Merced River Project](#)¹ and [Merced Falls Project](#).²

KEEP INFORMED OF PROJECT MILESTONES

To receive emails related to the Merced Projects and other similar projects overseen by the State Water Board's Division of Water Rights, interested persons should enroll in the "Water Rights Water Quality Certification" e-mail notification service. Instructions on how to sign up for the [State Water Board's Email Subscription List](#) are outlined below:

1. Visit:
http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.shtml
2. Provide your name and email in the required fields.
3. In the categories below the email and name fields, select "Water Rights," then "Water Rights Water Quality Certification."
4. Click the "Subscribe" button.
5. An email will be sent to you. You must respond to the email message to confirm your membership on the selected list(s).

¹ https://waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/mercedriver_ferc2179.html

² https://waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/mercedriver_ferc2179.html

By enrolling in this email list, you will receive notices related to the Division of Water Rights' Water Quality Certification Program work, including information pertaining to the Merced Projects' certification process. You can enroll or un-enroll from the email subscription service at any time. If you do not have internet access or do not wish to participate in the email subscription list, you may contact Bryan Muro by phone call to: (916) 327-8702 to request to receive notices by mail.

If you have questions related to this notice, the best means of contact is by email to: WR401Program@waterboards.ca.gov.



Oscar Biondi
Senior Water Resource Control Engineer
Water Quality Certification Program
Division of Water Rights

January 27, 2025
Date

**STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD**

In the Matter of Water Quality Certification for

**MERCED IRRIGATION DISTRICT'S
MERCED RIVER HYDROELECTRIC PROJECT
AND
MERCED FALLS HYDROELECTRIC PROJECT**

**FEDERAL ENERGY REGULATORY COMMISSION
PROJECT NOS. 2179 AND 2467**

Sources: Merced River and Tributaries

Counties: Merced and Mariposa

**DRAFT WATER QUALITY CERTIFICATION FOR
FEDERAL PERMIT OR LICENSE**

Table of Contents

1.0	Projects Background	7
2.0	Projects Description.....	8
2.1	Water Rights	8
3.0	Federal Energy Regulatory Commission Licensing Processes	12
4.0	Regulatory Authority.....	13
4.1	Water Quality Certification and Related Authorities	13
4.2	Water Quality Control Plans and Related Authorities	14
4.3	Clean Water Act Section 303(d) Listing.....	17
4.4	Construction General Permit.....	17
4.5	State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	18
4.6	Aquatic Weed Control General Permit.....	18
4.7	Statewide Mercury Provisions.....	18
5.0	California Environmental Quality Act	19
6.0	Rationale for Water Quality Certification Conditions	19
6.1	Rationale for Condition 1 – Instream Flows	21
6.2	Rationale for Condition 2 – Ramping Rates	30
6.3	Rationale for Condition 3 – Carryover Storage Requirements	30
6.4	Rationale for Condition 4 – Extremely Dry Conditions	31
6.5	Rationale for Condition 5 – Southern Delta Salinity.....	32
6.6	Rationale for Condition 6 – Merced River and Regional Watershed Groups	33
6.7	Rationale for Condition 7 – Annual Review Meeting	33
6.8	Rationale for Condition 8 – Water Quality Monitoring and Management	34
6.9	Rationale for Condition 9 – Large Woody Material Management.....	37
6.10	Rationale for Condition 10 – Erosion and Sediment Management	37
6.11	Rationale for Condition 11 – Gravel Augmentation.....	38
6.12	Rationale for Condition 12 – Riparian and Floodplain Improvements	38
6.13	Rationale for Condition 13 – Predator Suppression.....	39
6.14	Rationale for Condition 14 – Aquatic Invasive Species Management	39
6.15	Rationale for Condition 15 – Merced National Wildlife Refuge.....	40
6.16	Rationale for Condition 16 – Recreation Facilities Management	40
6.17	Rationale for Condition 17 – Road Management	40
6.18	Rationale for Condition 18 – Biological Monitoring and Management	41

6.19 Rationale for Condition 19 – Comprehensive Monitoring, Assessment, Reporting, and Special Studies	41
6.20 Rationale for Condition 20 – Construction and Maintenance	43
6.21 Rationale for Condition 21 – Reintroduction of Anadromous Fish	43
6.22 Rationale for Conditions 22 through 45	43
7.0 Conclusion	47
8.0 Water Quality Certification Conditions	48
CONDITION 1. Instream Flows	48
1.A Water Year Types	48
1.B Minimum Instream Flows Below New Exchequer Dam, at Shaffer Bridge, and at Stevenson Gage	50
1.C Pulse Flows	52
1.D Bay-Delta Plan Flow Objectives	52
1.E Compliance Methods	53
1.E.1 Minimum Instream Flows	54
1.E.2 Pulse Flows	54
1.E.3 LSJR Flow Objectives	55
1.E.4 Unplanned and Planned Temporary Flow Modifications	55
1.F Annual Operations Plan	56
1.G Dry Year Management Operations Plan	58
CONDITION 2. Ramping Rates	58
CONDITION 3. Carryover Storage Requirements	60
CONDITION 4. Extremely Dry Conditions	61
CONDITION 5. Southern Delta Salinity Objective	62
CONDITION 6. Merced River and Regional Watershed Groups	62
6.A Merced River Watershed Group	62
6.B Lower San Joaquin River Watershed Group (Regional Watershed Group)	64
CONDITION 7. Annual Review Meeting	64
CONDITION 8. Water Quality Monitoring and Management	65
8.A Temperature Monitoring and Management	65
8.B Dissolved Oxygen Management	68
8.C Mercury Monitoring and Management	70
8.D Other Constituents Monitoring and Management	71
CONDITION 9. Large Woody Material Management	73
CONDITION 10. Erosion and Sediment Management	74

CONDITION 11. Gravel Augmentation	76
CONDITION 12. Riparian and Floodplain Improvements	77
CONDITION 13. Predator Suppression	79
CONDITION 14. Aquatic Invasive Species Management	80
CONDITION 15. Merced National Wildlife Refuge	81
CONDITION 16. Recreation Facilities Monitoring and Management	82
CONDITION 17. Road Management	83
CONDITION 18. Biological Monitoring and Management	84
CONDITION 19. Monitoring, Assessment, Reporting, and Special Studies	86
19.A Monitoring, Assessment, and Special Studies Program	86
19.B Annual Summary Reports	89
19.C Comprehensive Reports	89
CONDITION 20. Construction and Maintenance	90
CONDITION 21. Reintroduction of Anadromous Fish	90
CONDITIONS 22 – 45	91
9.0 References	96

List of Tables

Table A. Water Rights Held by Merced ID for the Merced Projects	9
Table 1. Minimum Instream Flow Requirements at Shaffer Bridge	51
Table 2. Merced River Temperature Requirements	67
Table 3. Merced River Dissolved Oxygen Water Quality Objectives¹	69
Table 4. Merced National Wildlife Refuge Water Delivery Schedule	82

List of Figures

Figure 1. Merced River and Merced Falls Hydroelectric Projects Location Map (source FLA 2012)	100
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List of Appendices

Appendix A. Project Description

Appendix B. Consolidated Instream Flow Requirements (*for convenience and illustrative purposes*)

Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
AF	acre-feet
AFLA	Amended Final License Application
Bay-Delta	San Francisco Bay/ Sacramento-San Joaquin Delta Estuary
Bay-Delta Plan	Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary
BLM	United States Department of Interior, Bureau of Land Management
BMI	benthic macroinvertebrates
BMPs	best management practices
Board	State Water Resources Control Board
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
Central Valley Regional Water Board	Central Valley Regional Water Quality Control Board
CEQA certification	California Environmental Quality Act water quality certification
cfs	cubic feet per second
CVP	Central Valley Project
Delta	Sacramento-San Joaquin Rivers Delta
Deputy Director	Deputy Director for the Division of Water Rights
dS/m	deciSiemens per meter
DWR	California Department of Water Resources
EC	electrical conductivity
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ERDC	United States Army, Engineer Research and Development Center
ESA	Endangered Species Act
EXC	California Data Exchange Center's New Exchequer Dam station
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
IS	Initial Study
LSJR	Lower San Joaquin River
LWMMP	Large Woody Material Management Plan
MAF	million acre-feet
Merced Falls Project	Merced Falls Hydroelectric Project
Merced ID	Merced Irrigation District
Merced Projects	Merced River Hydroelectric Project and Merced Falls Hydroelectric Project; collectively

Merced River Project	Merced River Hydroelectric Project
mg/L	milligram per Liter
MIF	minimum instream flow(s)
mmhos/cm	milliMhos per centimeter
Monitoring Council	California Water Quality Monitoring Council
MST	California Department of Water Resources'
	Merced River at Stevinson gage
NEPA	National Environmental Policy Act
Ninth Circuit	United States Court of Appeals for the Ninth Circuit
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NWR	Merced National Wildlife Refuge
PG&E	Pacific, Gas & Electric Company
Reclamation	United States Bureau of Reclamation
Regional Water Board	Regional Water Quality Control Board
RM	River Mile
SED	Final Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacramento San Joaquin Delta Estuary
SJRMEP	San Joaquin River Monitoring and Evaluation Program
SR/SJR Basin Plan	Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin
State Water Board	State Water Resources Control Board
STM Working Group	Stanislaus, Tuolumne, and Merced Working Group
SWP	State Water Project
TAF	thousand acre-feet
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service
Vernalis	San Joaquin River at Vernalis
Water Boards	State Water Resources Control Board and the 9 Regional Water Quality Control Boards, collectively
WQMP Plans	Water Quality Monitoring and Protection Plans
WRAMP	California Wetland and Riparian Area Monitoring Plan
WSI	Water Supply Index
WUA	weighted usable area, instream physical rearing habitat

1.0 Projects Background

The Merced River Hydroelectric Project (Merced River Project) and Merced Falls Hydroelectric Project (Merced Falls Project), collectively Merced Projects, Federal Energy Regulatory Commission (FERC) Project Nos. 2179 and 2467, respectively, are located in the Merced River watershed, in Merced and Mariposa counties, California (Figure 1). The Merced Projects are owned and operated by Merced Irrigation District (Merced ID or Licensee).

Merced ID received the original FERC license for the Merced River Project on April 8, 1964 (1964 FERC license). On February 26, 2012, Merced ID filed its Final License Application (FLA) for the Merced River Project with FERC. On April 23, 2014, Merced ID filed with FERC an Amended Final License Application (AFLA). Merced ID submitted the AFLA to modify the Merced River Project's description and FERC boundary to accommodate proposed changes to recreation facilities. The original license expired on February 28, 2014, and the Merced River Project has operated under a FERC annual license since 2014.

Pacific Gas and Electric Company (PG&E) received the original FERC license for the Merced Falls Project on July 28, 1969, which expired on February 28, 2014. The Merced Falls Project has also operated under FERC annual licenses since 2014. On February 8, 2012, PG&E filed its FLA to relicense the Merced Falls Project with FERC. On March 2, 2017, PG&E transferred ownership of the Merced Falls Project to Merced ID.

On April 15, 2024, the State Water Resources Control Board (State Water Board or Board) received applications for water quality certification (certification) from Merced ID for the Merced Projects. The applications are associated with the decision by the United States Court of Appeals for the Ninth Circuit (Ninth Circuit) in *California State Water Resources Control Board v. FERC*.¹ As a brief background on the Ninth Circuit Court decision, in May 2019, Merced ID requested that FERC waive the Board's certification authority under section 401 of the Clean Water Act for the Merced Projects, and on June 18, 2020, FERC issued an order finding that the State Water Board waived its certification authority related to the Merced Projects. On August 4, 2022, the Ninth Circuit vacated FERC's June 18, 2020 order finding that the State Water Board waived its certification authority for the Merced Projects, and remanded the matter to FERC for action consistent with the Ninth Circuit's decision. On July 11, 2023, FERC instructed Merced ID to file within 60 days (1) copies of requests for certification, (2) a copy of valid certifications, or (3) evidence of waiver of the Board's certification authority. On September 1, 2023, Merced ID requested an extension of time until December 11, 2023; FERC granted this request on September 12, 2023. On December 11, 2023, Merced ID requested an additional extension until April 15, 2024, stating its intent to commence the California Environmental Quality Act (CEQA) process in January 2024 and its plan to submit a request for certification to the Board in early to mid-April 2024. FERC granted this extension request on December 18, 2023. On

¹ 43 F.4th 920 (9th Cir. 2022), cert denied 2023 WL 3440583 (Westlaw 2023).

April 15, 2024, the State Water Board received certification applications from Merced ID for the Merced Projects pursuant to section 401 of the Clean Water Act.

2.0 Projects Description

The majority of the Merced Projects' facilities are located on federal land administered by the United States Department of Interior, Bureau of Land Management (BLM) as part of the Sierra Resource Management Area. The major components of the Merced Projects include two reservoirs (Lake McClure and McSwain Reservoir), one impoundment (Merced Falls Dam), three powerhouses, various access roads, and other appurtenant facilities. The Merced River Project has an authorized installed capacity of 101.25 megawatts and the Merced Falls Project has an authorized installed capacity of 3.4 megawatts. A detailed description of the Merced Projects' facilities can be found in Appendix A.

2.1 Water Rights

Merced ID claims riparian water rights for the natural flow of the Merced River at both the New Exchequer and McSwain powerhouses. These riparian claims are documented with the State Water Board through Statements of Water Diversion and Use numbers 15475 and 15476. Merced ID also holds pre-1914 and adjudicated rights originally held by the Exchequer Gold Mine Company and the Crocker-Huffman Land Company, as well as post-1914 appropriative water rights obtained directly by Merced ID for the purpose of operating the Merced Projects. In addition, Merced ID holds water right licenses 2685, 6047, and 11395 (Applications 1224, 10572, and 16186, respectively) for irrigation, domestic use, recreational, and other purposes. In 2003, the State Water Board amended Merced ID's water right licenses 2685, 6047, and 11395 to require: (1) release of an additional 12,500 acre-feet (AF) of water annually in October; and (2) that MID provide a volume of supplemental flow during a 31-day pulse flow period during April and May. The 12,500 AF are provided in addition to the FERC minimum instream flows. A list of water rights for the Merced Projects is provided in Table A.

Merced ID is the appropriative water right holder for nearly all water authorized for diversion in the Merced River watershed. In the Merced River watershed, there are 105 post-1914 appropriative water rights, with a combined face value of approximately 5.5 million acre-feet (MAF). Of these 105 water rights, 101 are non-power water rights with a face value of approximately 1.04 MAF. Of the 101 non-power rights, six are held by the Merced ID with a total face value of approximately 1.02 MAF. The 1.02 MAF of these six water rights held by MID accounts for approximately 98 percent of the water authorized for diversion (based on face value) under non-power water rights in the Merced River watershed.

On December 30, 2019, Merced ID submitted a new appropriative water right application (Application ID A033098) to increase its maximum annual diversion amount by 400,000 AF per year from the Merced River and 11 other streams in eastern Merced County. The application is currently pending before the State Water Board.

Table A. Water Rights Held by Merced ID for the Merced Projects

Application Number	Permit ID	License ID	Water Right Type	Status	Status Date	Face Value Amount ¹	Beneficial Use ²	County
A008238	4893	6032	Appropriative	Licensed	2/11/1935	5,066	DOM, IRR	Merced
A006470	3456	1911	Appropriative	Licensed	10/31/1929	1,266,960.6	POW	Merced
A001221	912	990	Appropriative	Licensed	3/26/1919	868,773	POW	Mariposa
A016186	12825	11395	Appropriative	Licensed	8/15/1983	605,000	IRR, WILD, DOM, REC, AQUA	Mariposa
S010405	--	--	Statement of Diversion and Use	Claimed	6/29/1981	0	POW	Merced
S015475	--	--	Statement of Diversion and Use	Claimed	1/8/2004	0	POW	Mariposa
A033098	--	--	Appropriative	Pending	12/30/2019	400,000	WILD, WQ, AQUA, IND, MUN, STOCK, DOM, IRR, INPOW, FROST, REC	Merced
S004718	--	--	Statement of Diversion and Use	Claimed	1/1/1975	0	IRR	Merced
S004719	--	--	Statement of Diversion and Use	Claimed	1/1/1975	0	IRR	Merced
A010572	6808	6047	Appropriative	Licensed	6/20/2003	63,719.9	IRR	Merced
A001222	913	2684	Appropriative	Licensed	3/26/1919	491,080.2	POW	Mariposa
A001224	914	2685	Appropriative	Licensed	6/20/2003	345,440	DOM, IRR, MUN	Mariposa, Merced
A006807	5732	5227	Appropriative	Licensed	9/27/1930	1,251.2	DOM, IRR	Merced
A018774	13088	9429	Appropriative	Licensed	6/8/1959	5,000	DOM, IRR	Merced
S004705	--	--	Statement of Diversion and Use	Claimed	1/1/1975	0	POW, REC	Merced

Application Number	Permit ID	License ID	Water Right Type	Status	Status Date	Face Value Amount¹	Beneficial Use²	County
A016187	12826	11396	Appropriative	Licensed	8/15/1983	1,861,824.9	POW	Mariposa
S015476	--	--	Statement of Div and Use	Claimed	1/8/2004	0	POW	Mariposa

¹ Values shown in acre-feet.

² Domestic (DOM), Irrigation (IRR), Power (POW), Fish and Wildlife Preservation and Enhancement (WILD), Recreation (REC), Aquaculture (AQUA), Water Quality (WQ), Industrial (IND), Municipal (MUN), Stockwatering (STOCK), Incidental Power (INPOW), Frost Protection (FROST).

2.1.1 Contractual Obligations

In addition to the 1964 FERC license requirements (see Appendix A), four agreements and contracts include various streamflow-related requirements. A summary of the agreements and contracts, and their associated terms and conditions, which are not part of the 1964 FERC license, are provided below.

2.1.1.1 California Department of Fish and Wildlife² Memorandum of Understanding

Merced ID is required to supplement flows in the Merced River in October by providing 12,500 AF of water in addition to the Merced Projects' existing FERC minimum flow requirement in that month. This 12,500 AF is reflected in the amended water right licenses 2685, 6047, and 11395 discussed above.

2.1.1.2 Water Supply Deliveries in Lake McClure

In addition to its own regular water supply and power generation withdrawals, Merced ID withdraws or allows withdrawals of water from Lake McClure for three other entities or uses as follows: (1) Lake Don Pedro Community Service District withdraws up to about 5,000 AF of water annually from a location just north of Barrett Cove Marina; (2) Merced ID recreation facilities annually withdraw less than 1,000 AF of water at three locations along Lake McClure; and (3) McClure Boat Club, a small development adjacent to the Merced River Project, withdraws about 25 AF of water at a point near the development. These withdrawals are minor, and do not affect operation of the Merced Projects. Merced ID anticipates that these withdrawals will continue unchanged.

² Formerly the California Department of Fish and Game.

2.1.1.3 Cowell Agreement

The Cowell Agreement is a contractual obligation recorded in 1926 between Merced ID and certain downstream water diverters. Under the Cowell Agreement, Merced ID releases water from Crocker-Huffman diversion dam, as shown in Table B in cfs, for use by the Cowell Agreement diverters at 11 locations within the Merced River watershed.

Table B. Flows on the Merced River Downstream of Crocker-Huffman Diversion Dam for Cowell Agreement Diverters

Month	Cowell Agreement Flows (cfs)
March	100
April	175
May	225
June - February	Starting June 1 st sustain 250 cfs until inflows to New Exchequer fall below 1,200 cfs, then sustain 225 cfs for 31 days, 175 cfs for 31 days, and 150 cfs for 30 days and 50 cfs thereafter or the natural inflow into Lake McClure, whichever is less, through the last day of February.

2.1.1.4 Davis-Grunsky Act

In 1959, the California Legislature authorized bond sales for development of local water projects through the Davis-Grunsky Act. On October 31, 1967, the California Department of Water Resources (DWR) and Merced ID entered into a contract for recreation and fish enhancement grants under the Davis-Grunsky Act (Davis-Grunsky contract). As part the Davis-Grunsky contract Merced ID agreed to maintain continuous flows of 180 - 220 cfs in the Merced River spawning area (between Crocker-Huffman diversion dam and the Santa Fe Railroad Bridge at Cressy) each year from November 1 to April 1. The Davis-Grunsky contract expired on December 31, 2017, since which time Merced ID has ceased providing the flows.

3.0 Federal Energy Regulatory Commission Licensing Processes

On February 8, 2012, PG&E filed with FERC its final relicensing application for the Merced Falls Project. Similarly, on February 26, 2012, Merced ID filed with FERC its final relicensing application for Merced River Project. On April 23, 2014, Merced ID filed with FERC an Amended Final License Application for the Merced River Project. Both applications followed FERC’s Integrated Licensing Process. FERC issued the *Final Environmental Impact Statement for hydropower licenses Merced River Hydroelectric Project—FERC Project No. 2179-043 and Merced Falls Hydroelectric Project—FERC Project No. 2467-020* (Final EIS) on December 4, 2015, in compliance with National Environmental Policy Act (NEPA) requirements. The Merced Projects have been operating under annual FERC licenses (i.e., license conditions established in 1964 and 1969 for the Merced River Project and Merced Falls Project, respectively) since their licenses expired in 2014.

4.0 Regulatory Authority

4.1 Water Quality Certification and Related Authorities

The federal Clean Water Act (33 U.S.C. §§ 1251 et seq.) was enacted “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” (33 U.S.C. § 1251(a).) The Clean Water Act relies significantly on state participation and support, in light of “the primary responsibilities and rights of the State to prevent, reduce, and eliminate pollution” and “plan the development and use” of water resources. (*Id.*, § 1251(b).) Section 101 of the Clean Water Act (33 U.S.C. § 1251(g)) requires federal agencies to “co-operate with State and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution in concert with programs for managing water resources.” (33 U.S.C. § 1251(g))

Section 401 of the Clean Water Act (33 U.S.C. § 1341) requires any applicant for a federal license or permit that may result in a discharge into navigable waters to provide the licensing or permitting federal agency with certification that the project will comply with specified provisions of the Clean Water Act, including water quality standards and implementation plans promulgated pursuant to section 303 of the Clean Water Act (33 U.S.C. § 1313). Clean Water Act section 401 directs the agency responsible for certification to prescribe effluent limitations and other conditions necessary to ensure compliance with the Clean Water Act and with “any other appropriate requirement of State law.” (33 U.S.C. §1341(d).) Section 401 further provides that certification conditions shall become conditions of any federal license or permit for the project. (*Ibid.*)

The State Water Board is the state agency responsible for Section 401 certification in California. (Wat. Code, § 13160.) The State Water Board has delegated authority to act on applications for certification to the Executive Director of the State Water Board. (Cal. Code Regs., tit. 23, § 3838, subd. (a).)

In addition, Water Code section 13383 provides the State Water Board with the authority to “establish monitoring, inspection, entry, reporting, and recordkeeping requirements... and [require] other information as may be reasonably required” for activities subject to certification under section 401 of the Clean Water Act that involve the diversion of water for beneficial use. The State Water Board delegated this authority to the Deputy Director of the Division of Water Rights (Deputy Director), as provided for in State Water Board Resolution No. 2012-0029 (State Water Board 2012). In the *Redelegation of Authorities Pursuant to Resolution No. 2012-0029* memo issued by the Deputy Director on April 20, 2023, authority was redelegated to the Assistant Deputy Directors of the Division of Water Rights (State Water Board 2023a).

4.1.1 Procedure, Application, and Noticing

Merced ID filed applications for certification with the State Water Board under section 401 of the Clean Water Act for the Merced Projects on April 15, 2024. On December 10, 2024, State Water Board staff provided public notice of the applications pursuant to California Code of Regulations, title 23, section 3858, by posting information

describing the Merced Projects on the State Water Board's website. No comments were received in response to these notices.

On December 9, 2024, State Water Board staff forwarded Merced ID's applications for certification to the Executive Officer of the Central Valley Regional Water Quality Control Board (Central Valley Regional Water Board). (See Cal. Code Regs., tit. 23, § 3855, subd. (b)(2)(B).) On January 13, 2025, Central Valley Regional Water Board staff responded, stating they had no comments.

4.2 Water Quality Control Plans and Related Authorities

The State Water Board's certification for the Merced Projects must ensure compliance with the water quality standards in the Central Valley Regional Water Board's *Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin* (SR/SJR Basin Plan) (Central Valley Regional Water Board, 2019) and the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) (State Water Board 2018b), and any amendments thereto.

Water quality control plans designate the beneficial uses of water to be protected (such as municipal and domestic supply, industry, agriculture, and fish and wildlife habitat), water quality objectives for the reasonable protection of the beneficial uses and the prevention of nuisance, and a program of implementation to achieve the water quality objectives. (Wat. Code, §§ 13241, 13050, subds. (h), (j).) The beneficial uses, together with the water quality objectives contained in the water quality control plans and applicable state and federal anti-degradation requirements, constitute California's water quality standards for purposes of the Clean Water Act. In issuing certification for a project, the State Water Board must ensure consistency with the designated beneficial uses of waters affected by the project, the water quality objectives developed to protect those uses, and anti-degradation requirements. (*PUD No. 1 of Jefferson County v. Washington Dept. of Ecology* (1994) 511 U.S. 700, 714-719 (*PUD No. 1*).

The nine Regional Water Quality Control Boards (Regional Water Boards) have primary responsibility for the formulation and adoption of water quality control plans for their respective regions, subject to State Water Board and United States Environmental Protection Agency (USEPA) approval, as appropriate. (Wat. Code, § 13240 et seq.) As noted above, the State Water Board may also adopt water quality control plans, which will supersede regional water quality control plans for the same waters to the extent of any conflict. (*Id.*, § 13170.) The State Water Board and Regional Water Boards (collectively Water Boards) adopt the plans pursuant to their authorities under the Porter-Cologne Water Quality Control Act (Wat. Code, §§ 13000 et seq.) and the federal Clean Water Act (33 U.S.C. § 1313).

Periodic Review. The State Water Board has commenced the 2024 Review of State Water Quality Control Plans and State Policies for Water Quality Control (2024 Review of State Plans and Policies). State water quality control plans and policies for water quality control (State Plans and Policies) contain water quality standards and other provisions established by the State Water Board to preserve and enhance California's

waters to safeguard human health, support aquatic ecosystems, improve the quality of water resources, and protect beneficial uses of waters.

Triennial reviews are conducted pursuant to the federal Clean Water Act (33 U.S.C. § 1251 et seq.) and its implementing regulations, and periodic reviews are conducted pursuant to the Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.). (See 33 U.S.C. § 1313(c)(1), 40 C.F.R. § 131.20(a), Wat. Code, §§ 13143, 13170, 13170.2, subd. (b), 13240.) For the 2024 review cycle, the State Water Board will be conducting triennial review and periodic review in a single combined proceeding. In addition to reviewing State Plans and Policies, the 2024 Review of State Plans and Policies will include consideration of the federally promulgated water quality standards for California (40 C.F.R. §§ 131.36, 131.37 and 131.38) and the Clean Water Act section 304(a) recommended criteria.

The 2024 Review of State Plans and Policies will help engage the public and interested persons to identify potential changes or additions that will help to guide the State Water Board's priorities for future amendments to the State Plans and Policies, including new or revised water quality standards that are enforceable for the waterbodies for which they are established.

Section 10(a)(2)(A) of the Federal Power Act requires FERC to consider the extent to which a project is consistent with Federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by a project. In March 2019, the State Water Board submitted to FERC the plans and policies included in the state's comprehensive plan for orderly and coordinated control, protection, conservation, development, and utilization of the water resources of the state. This submission included the Central Valley Basin Plan and Antidegradation Policy, which are discussed above, and other applicable plans and policies for water quality control. (FERC 2024.)

4.2.1 Sacramento and San Joaquin Rivers Basin Plan

The Central Valley Regional Water Board adopted, and the State Water Board and USEPA approved, the SR/SJR Basin Plan. The SR/SJR Basin Plan designates the beneficial uses of water to be protected along with the water quality objectives necessary to protect those uses. The Central Valley Basin Plan specifies that the beneficial uses of any specifically identified waterbody generally apply to its tributary streams. The existing beneficial uses for Lake McClure and McSwain Reservoir are: irrigation; power; contact recreation; other non-contact recreation; warm and cold freshwater habitat; and wildlife habitat. Additionally, municipal and domestic supply is a potential beneficial use for Lake McClure and McSwain Reservoir. The existing beneficial uses from McSwain Reservoir to the San Joaquin River are: municipal and domestic water supply; stock watering; process; service supply; power; contact recreation; canoeing and rafting; other non-contact recreation; warm and cold freshwater habitat; warm and cold migration; warm and cold spawning; and wildlife habitat.

4.2.2 Bay-Delta Plan

The Bay-Delta Plan establishes water quality objectives to protect beneficial uses of water in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta) and tributary watersheds, including drinking water supply, irrigation supply, and fish and wildlife. The State Water Board adopts the Bay-Delta Plan pursuant to its authorities under the Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.) and the federal Clean Water Act (33 U.S.C. § 1313).

The State Water Board has historically developed the water quality control plan for the Bay-Delta for several reasons. The Bay-Delta is a critically important natural resource that is both the hub of California's water supply system and the most valuable estuary and wetlands system on the West Coast. Because diversions of water within and upstream of the Bay-Delta Estuary are a driver of water quality in the Bay-Delta watershed, much implementation of the Bay-Delta Plan relies on the combined water quality and water right authority of the State Water Board. In addition, the Bay-Delta falls within the boundaries of two Regional Water Boards. Having the State Water Board develop and adopt water quality control plans that cross Regional Water Board boundaries ensures a coordinated approach.

The beneficial uses in the Bay-Delta Plan are: municipal and domestic supply; industrial service supply; industrial process supply; agricultural supply; groundwater recharge; navigation; water contact recreation; non-contact water recreation; shellfish harvesting; commercial and sport fishing; warm freshwater habitat; cold freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; estuarine habitat; wildlife habitat; and rare, threatened, or endangered species.

In 2018, the Bay-Delta Plan was updated to adopt new and revised Lower San Joaquin River (LSJR) flow objectives and revised southern Sacramento-San Joaquin Rivers Delta (Delta) salinity objectives. The new and revised LSJR flow objectives apply from February – June to the Stanislaus, Tuolumne, and Merced Rivers and include a baseflow requirement that applies on the San Joaquin River at Vernalis (Vernalis). In addition, the Bay-Delta Plan includes a revised southern Delta salinity objective of 1.0 deciSiemens/meter (dS/m) electrical conductivity (EC) at Vernalis and at the three interior southern Delta stations for the protection of agricultural beneficial uses. The 2018 updates to the Bay-Delta Plan retain the LSJR flow objective that applies to the San Joaquin River at Vernalis during October.

On August 8, 2022, the State Water Board issued a notice of preparation of environmental documentation and scoping meeting for a proposed regulation to implement the 2018 updates to the Bay-Delta Plan. Additionally, the Bay-Delta Plan provides pathways for voluntary agreements to implement the LSJR flow portions of the Bay-Delta Plan for the “[t]ributaries as a whole, an individual tributary, or some combination thereof.” In 2022, the State Water Board received a voluntary agreement proposal from parties on the Tuolumne River. On April 11, 2023, the State Water Board issued a notice of preparation of environmental documentation and scoping meeting for possible amendment of the Bay-Delta Plan to consider incorporation of the proposed

Tuolumne River voluntary agreement as partial implementation of the LSJR objectives. In the case of the Tuolumne River voluntary agreement proposal, the State Water Board needs to consider Bay-Delta Plan updates because the proposal does not fully conform to the current provisions of the Bay-Delta Plan. Evaluation and consideration of the Tuolumne River voluntary agreement proposal is ongoing.

The State Water Board is currently considering additional updates to the Bay-Delta Plan focused on the Sacramento River and its tributaries, Delta eastside tributaries (including the Calaveras, Cosumnes, and Mokelumne Rivers), interior Delta flows, and Delta outflows, including consideration of proposed voluntary agreements. On October 25, 2024, the State Water Board started a public comment period to solicit input on the proposed draft updates³ to the Bay-Delta Plan.

4.3 Clean Water Act Section 303(d) Listing

On February 6, 2024, the State Water Board adopted the 2020-2022 California Integrated Report (Clean Water Act Section 303(d) List/305(b) Report) (California Integrated Report; State Water Board 2022b) and it was approved by USEPA on May 11, 2022. The Merced River, from the San Joaquin River to McSwain Reservoir, McSwain Reservoir, and Lake McClure are on the Clean Water Act Section 303(d) list of impaired waterbodies. The Merced River is listed as impaired for water temperature, dissolved oxygen, mercury, Group A pesticides,⁴ and unknown toxicity. McSwain Reservoir and Lake McClure have been identified as being impaired for mercury. Total maximum daily loads are written plans that define the maximum amount of a pollutant that a waterbody can receive without exceeding water quality standards and establish load allocations for point and nonpoint sources of pollution.

4.4 Construction General Permit

Merced ID may need to obtain coverage under the [*General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities*](#) (Construction General Permit)⁵(State Water Board 2022a) for activities that disturb one or more acres of soil or activities that disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres. Construction activities subject

³ https://waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/2024/draft-sacdelta-bdplan-updates.pdf (Accessed: January 23, 2025).

⁴ Group A pesticides consist of aldrin, dieldrin, chlordane, endrin, heptachlor, heptachlor epoxide, hexachlorocyclohexanes (including lindane), endosulfan, and toxaphene.

⁵ Water Quality Order No. 2022-0057-DWQ and NPDES No. CAS000002, supersedes Orders No. 2009-0009-DWQ, 2010-0014-DWQ, and 2012-0006-DWQ, and any amendments thereto except for: (1) the requirement to submit annual reports by September 1, 2023, (2) enforcement purposes, and (3) as set forth in Section III.C of Order No. 2022-0057-DWQ. Available online at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html (Accessed: November 14, 2024).

to the Construction General Permit include clearing, grading, and disturbances to the ground, such as stockpiling or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

4.5 State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State

The [State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State](#) (Dredge or Fill Procedures)⁶ (State Water Board 2019 and 2021) provide California's definition of wetland, wetland delineation procedures, and procedures for submitting applications for activities that could result in discharges of dredged or fill material to waters of the state. The Dredge or Fill Procedures ensure that State Water Board regulatory activities will result in no net loss of wetland quantity, quality, or permanence, consistent with the Water Code sections 16200-16201. Merced ID must comply with the Procedures when conducting dredge or fill activities that may impact waters of the state, including wetlands.

4.6 Aquatic Weed Control General Permit

The [Statewide National Pollutant Discharge Elimination System Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications](#) (Aquatic Weed Control General Permit)⁷ applies to projects that require aquatic weed management activities. The Aquatic Weed Control General Permit sets forth detailed management practices to protect water quality from pesticide and herbicide use associated with aquatic weed control.

4.7 Statewide Mercury Provisions

On May 2, 2017, the State Water Board adopted Resolution No. 2017-0027, which approved *Final Part 2 of the [Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California—Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions](#)*.⁸ (State Water Board, 2017a) Resolution No. 2017-0027 provides a consistent regulatory approach throughout the state by setting mercury limits to protect the beneficial uses associated with the consumption of fish by both people

⁶ The Dredge or Fill Procedures and any amendments thereto. Available online at: https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedures.pdf. (Accessed: January 16, 2025).

⁷ Water Quality Order No. 2013-0002-DWQ and NPDES No. CAG990005, as amended by Order No. 2014-0078-DWQ, Order No. 2015-0029-DWQ, Order No. 2016-0073-EXEC, and any amendments thereto. Available online at: https://www.waterboards.ca.gov/water_issues/programs/npdes/pesticides/weed_control.html. (Accessed: November 14, 2024).

⁸ Available online at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2017/050217_6_appx_a.pdf (Accessed: January 21, 2025).

and wildlife. The State Water Board also established definitions for the following three new beneficial use definitions (tribal traditional culture, tribal subsistence fishing, and subsistence fishing) for use by the Water Boards. In addition, the State Water Board approved one narrative and four numeric mercury objectives to apply to inland surface waters, enclosed bays, and estuaries of the state that have any of the following beneficial use definitions: commercial and sport fishing, tribal traditional culture, tribal subsistence fishing, wildlife habitat, marine habitat, preservation of rare and endangered species, warm freshwater habitat, cold freshwater habitat, estuarine habitat, or inland saline water habitat, with the exception of waterbodies or waterbody segments with site-specific mercury objectives. These provisions will be implemented through NPDES permits, water quality certifications, waste discharge requirements, and waivers of waste discharge requirements.

5.0 California Environmental Quality Act

Merced ID is the lead agency for the purposes of CEQA. (Pub. Resources Code, §§ 21000 – 21177.) The State Water Board is a responsible agency. On May 15, 2024, Merced ID filed with FERC a status report regarding its activities related to obtaining certification for the Merced Projects. The report to FERC noted that Merced ID intends to start tribal consultation and issue a notice of intent to rely on FERC’s Final EIS, in combination with a Supplemental Analysis, to satisfy CEQA. In the status report, Merced ID further noted its intent to adopt a final CEQA Negative Declaration or Mitigated Negative Declaration by the end of March 2025. On May 28, 2024, Merced ID issued a *Notice of Intent to Rely on FERC Final Environmental Impact Statement, With Mandatory Conditions, in Combination with a Supplemental Analysis, to Satisfy CEQA for the Merced River Hydroelectric Project and Merced Falls Hydroelectric Project Relicensings*.

6.0 Rationale for Water Quality Certification Conditions

This section of the certification explains that the grant of certification, as conditioned, is warranted and why the conditions in Section 8.0 of this certification are necessary to ensure that the Merced Projects and their discharges comply with water quality requirements. This section also includes, as necessary, citations to federal, state, or tribal laws that authorize the conditions and sets forth citations to applicable regulatory authority. In general, the code citations, plans, and policies that support issuance of this certification are described more fully in Section 4.0 and may not be duplicated in this section. The explanation and citations should be evaluated in the context of the certification as a whole, but the certification conditions are set forth only in Section 8.0.

As explained in this section, the conditions in this certification are generally required pursuant to the SR/SJR Basin Plan and the Bay-Delta Plan, as described in Section 4.0, Regulatory Authority.

The Dredge or Fill Procedures, adopted pursuant to Water Code sections 13140 and 13170, authorize approval of dredge or fill projects subject to satisfaction of specified requirements. California Code of Regulations, title 23, sections 3830 et seq., set forth

state regulations pertaining to certifications. In particular, section 3856 sets forth information that must be included in certification requests, and section 3860 sets forth standard conditions that shall be included in all certification actions.

Water Code sections 13267 and 13383 authorize the Water Boards to establish monitoring and reporting requirements for persons discharging or proposing to discharge waste to navigable waters. Water Code section 1051 additionally authorizes the State Water Board to investigate waters diverted for beneficial use. Moreover, this certification ensures continued monitoring, reporting, and assessment of water quality for discharges that may impact waters of the state.

Fish and Game Code section 5937 requires any owner of a dam to allow sufficient water to pass over, around, or through the dam to keep in good condition any fish that may be planted or exist downstream. Section 5937 and requirements to maintain or monitor flow or other water quality characteristics as required to meet section 5937 are appropriate conditions of state law necessary to protect fishery beneficial uses.

The conditions in this certification were developed to ensure compliance with water quality standards and water quality requirements established under the Porter-Cologne Water Quality Control Act and the federal Clean Water Act, including requirements in applicable water quality control plans, and other appropriate requirements of state law. The conditions in Section 8.0 of this certification are necessary to protect the beneficial uses of waters of the state identified in water quality control plans, prevent degradation of water quality, and help ensure compliance with state and federal water quality requirements.

When preparing the conditions in this certification, State Water Board staff reviewed and considered:

- The final license applications submitted by Merced ID (Merced ID, 2012a), Merced ID's amendment to the final license application for the Merced River Project (Merced ID, 2012b), and PG&E (PG&E, 2012) to FERC, Merced ID's applications for certification, and any updates thereto;
- Comments submitted on the draft license applications;
- The draft (FERC, 2015a) and Final EIS (FERC, 2015b) prepared pursuant to NEPA, including comments submitted on the draft EIS;
- *Bureau of Land Management Final Section 4(e) Conditions, Final Recommendations, Terms and Conditions for the Merced River Hydroelectric Project 2179-043* (BLM, 2015);
- Existing and potential beneficial uses and associated water quality objectives in the SR/SJR Basin Plan and Bay-Delta Plan;
- USEPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (USEPA, 2003);
- Final 2020-2022 California Integrated Report (Clean Water Act Section 303(d) List/305(b) Report) (State Water Board, 2024);

- Applicable water quality information, permits, policies, objectives, implementation measures, and programs (e.g., Dredge or Fill Procedures, Construction General Permit, etc.);
- Merced Projects-related controllable water quality factors; and
- Other information in the record.

This certification is issued pursuant to the final 2023 Clean Water Act Section 401 Water Quality Certification Rule (Fed. Reg. 66558-66666 (September 27, 2023) [amending 40 C.F.R. Parts 121, 122, 124]) that went into effect on November 27, 2023 (2023 Rule), but also complies with the previous 2020 Rule that was in effect for portions of 2020-2023 should it reemerge as a result of litigation or any other reason. To the extent FERC considers any certification condition to include requirements outside the substantive scope of USEPA’s *Clean Water Act Section 401 Certification Rule*, 85 Fed. Reg. 42,210 (July 13, 2020) (2020 Rule), the 2020 Rule— including but not limited to 40 C.F.R. §§ 121.1(f) and (n), 121.3, 121.7(d)(1), and 121.9(b)—is inconsistent with federal law and controlling case law. The 2023 Rule restores the scope of certification “that is consistent with not only the statutory language and congressional intent but also longstanding [USEPA] guidance and decades of Supreme Court case law.” (Fed. Reg. 65591-66606 [Scope of Certification].) Under section 401 of the Clean Water Act, when an activity requiring a federal permit or license “may result in any discharge into the navigable waters,” the applicant is required to obtain a certification that states the activity will comply with applicable water quality standards and that also sets forth any “limitations” and “monitoring requirements” necessary to assure that the “applicant” will comply with water quality standards and “any other appropriate requirement of State law.” (33 U.S.C. § 1341(a) & (d).) Certification is required for such activity as a whole, not merely for its point-source discharges to waters of the United States. (*PUD No. 1*, supra, 511 U.S. at pp. 711- 712.) USEPA replaced the 2020 Rule because, among other faults, it “may prevent state and tribal authorities from adequately protecting their water quality,” “may result in a state or tribe’s certification or conditions being permanently waived as a result of non-substantive and easily fixed procedural concerns,” and “may limit the flexibility of certifications and permits to adapt to changing circumstances.” (86 Fed. Reg. 29,543- 29,544 (June 2, 2021).) As explained in this certification, each certification condition is authorized by applicable state and federal law and is necessary to ensure compliance with such laws. This paragraph is hereby incorporated as part of the explanatory statement for each condition of this certification.

6.1 Rationale for Condition 1 – Instream Flows

Condition 1 is a suite of minimum instream flow requirements that includes FERC staff recommendations, flows to protect baseline conditions, and flow requirements to meet state water quality standards and other appropriate requirements of state law. The minimum instream flows outlined in Condition 1 maintain baseline flow conditions from November through January to support spawning and early rearing for native resident and migratory fish, require increased flows from February through June to support rearing and migration for native resident and migratory fish, and increased flows from July through October to support native fish species that remain in the Merced River over

the summer and migrate upstream to spawn in the fall. Conditions 1.B, 1.C, and 1.D are based on information contained in FERC's 2015 Final EIS, the 2018 [Final Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacramento San Joaquin Delta Estuary](#) (2018 SED) (State Water Board, 2018a),⁹ the 2022 drying of the Merced River, and other pertinent and scientific information that became available after the State Water Board adopted the 2018 SED.

Overview of Minimum Instream Flows (Condition 1.B). The minimum instream flows listed in Table 1 of Condition 1.B are consistent with FERC recommended base flows from March 16 through October 31. The minimum flows listed in Table 1 of Condition 1.B for November 1 – March 15 and Condition 1.D flows are greater than the FERC recommended flow schedule because analyses in the 2018 SED and more recent scientific information show that flows greater than the FERC recommended flows are needed to provide reasonable protection of native resident and migratory fish species that use the Merced River, LSJR, and Bay-Delta, and that such flows have been impacted by the Merced Projects. The November 1 through March 15 flows required in Condition 1.B were required in the Merced River for 50 years (1967 – 2017), under the Davis-Grunsky contract, to maintain a minimum level of suitable habitat for spawning and rearing Chinook salmon. Protecting baseline conditions is important to prevent degradation of habitat for native resident and migratory fish species.

Minimum instream flows listed in Table 2 of Condition 1.B are in response to the dry conditions the Merced River experienced in the summer of 2022, which resulted in four months of disconnection of the Merced River from the mainstem of the LSJR. The State Water Board received letters¹⁰ notifying the Board of dry river conditions with requests to investigate and develop and implement actions to prevent the Merced River from drying in the future. Additional information on minimum instream flows is provided in the subsection 6.1.2 below.

Overview of Pulse Flows (Condition 1.C). Condition 1.C flows are generally consistent with FERC staff recommended pulse flows in the spring and fall with one modification to include the month of February in the spring pulse flow window, thereby providing for increased flexibility and effectiveness of the spring pulse flows. These flow schedules are a substantial increase from the flow requirements in the existing FERC licenses and are needed to improve instream conditions for native resident and migratory fish populations. Additional information on pulse flows is provided in the subsection 6.1.3 below.

⁹ Available online at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2018_sed/ (Accessed: January 23, 2025)

¹⁰ National Marine Fisheries Service, California Department of Fish and Wildlife, San Francisco Baykeeper, Friends of the River, California Sportfishing Protection Alliance, The Nature Conservancy, and at least one local landowner.

Overview of Bay-Delta Flows (Condition 1.D). Condition 1.D applies a percent of unimpaired flow requirement at the confluence of the Merced River and LSJR to meet the Merced River portion of the LSJR flow objectives in the Bay-Delta Plan. Additional information on Bay-Delta flows is provided in the subsection 6.1.4 below.

Generally, flow requirements in Condition 1.D are higher than flow requirements in Conditions 1.B and 1.C in the February through June period. Condition 1.D flows can be used to meet the requirements of Conditions 1.B and 1.C in the February through June period or contribute to flow requirements from July to January with State Water Board approved adaptive implementation of Condition 1.D flows or through a voluntary agreement consistent with the Bay-Delta Plan.

6.1.1 Rationale for Condition 1.A: Water Year Types

Currently, Merced ID has established a five-level water year classification system for the Merced River. The Merced 60-20-20 Index is based on the unregulated inflow to Lake McClure. The five-level water year classifications are: Wet, Above Normal, Below Normal, Dry, and Critically Dry. The Merced 60-20-20 Index is similar to the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) and shares the same five-water year classifications. The index and water year classifications are calculated based on: 60 percent of the current year's April through July inflow, plus 20 percent of the current year's October through March inflow, plus 20 percent of the lesser of the previous year's index or 675 thousand acre-feet (TAF). This certification uses Merced ID's water year classifications to determine water year type with flexibility to modify the water year type classification system during the term of the new FERC license(s) for the Merced Projects. This flexibility is needed due to the importance water year classifications play in establishing flow and other requirements of the certification, and the role a changing climate may play during the term of a new FERC license(s) for the Merced Projects (e.g., decreasing snowpack, changed timing of precipitation, etc.). Projected changes in climate also have the ability to significantly alter the hydrology of the system.

Water year type determinations are a critical aspect of water management and project operations. Merced ID's water year classification system relies on unregulated inflow to Lake McClure such that it is important that the methods and sources of information from which unregulated flow is measured are accurate representations of the system. Due to the importance of water year type determinations, Merced ID must use the best available information and technologies to support water year type determinations throughout the term of the new FERC license(s).

6.1.2 Rationale for Condition 1.B: Minimum Instream Flows Below New Exchequer Dam, at Shaffer Bridge, and at Stevinson Gage

McSwain Reservoir may back up to the base of New Exchequer Dam when McSwain Reservoir is at full pool; however, this is not likely when McSwain Reservoir is drawn down. Condition 1.B requires Merced ID to provide a minimum discharge of 25 cfs at

New Exchequer Dam to prevent dewatering of the river reach between the New Exchequer Dam and McSwain Reservoir.

Condition 1.B contains water year type specific minimum instream flow requirements on the Merced River at Shaffer Bridge. From March 16 through June 30, the required minimum instream flow schedule is consistent with the FERC staff recommendation, which is based on information in the 2015 Final EIS. The FERC staff flow schedule was developed with input from stakeholders and environmental agencies. The analysis considered tradeoffs between improving temperature conditions for fish life stages with the amount of cold water stored in Lake McClure, enhancing instream physical habitat (estimated by weighted usable area (WUA)) for native resident and migratory fish, providing flows that encourage juvenile outmigration prior to unfavorable temperature conditions, and conserving water for irrigation purposes. During the late spring and summer, the flows were designed to improve water temperatures for smoltification and provide reasonable instream physical habitat (estimated by WUA) for *Oncorhynchus mykiss* (*O. mykiss*) juveniles and adults, while at the same time conserving cold water reservoir storage for later in the year and making more water available for irrigation and other beneficial uses.

From March 16 to October 31, minimum flow values in Condition 1.B are primarily based on Table 5-1 (page 5-14) of FERC's Final EIS. In response to comments received from Merced River Conservation Committee, California Sportfishing Protection Alliance, Golden West Women Flyfishers, Friends of the River, American Rivers, American Whitewater, Northern California Council Fly Fishers International, and the Sierra Club Tehipite Chapter (collectively, Conservation Groups) on July 16, 2020, and recognizing the need for increased flows in dry years to protect instream habitat, minimum instream flows from July – October of Dry and Critically Dry water years were increased from 100 cfs to 150 cfs to support the temperature criteria identified in Condition 8.A. Table 3. From November 1 to March 15, Condition 1.B incorporates minimum flows formerly required by the Davis-Grunsky contract to ensure protection of conditions that support salmon spawning, egg incubation, and recreation, and more recent scientific information than the 2015 Final EIS. The flows are needed to prevent degradation of baseline instream habitat conditions and to avoid further reductions in persistently low survival of juvenile salmonids and returning adults to spawn in the Merced River. From November 1 through March 15, the minimum instream flow requirements are equivalent, at a minimum, to flow commitments that existed for 50 years (1967-2017) under the Davis-Grunsky contract. The November through mid-March flows range from 180 cfs to 220 cfs (based on dry and normal water year types

defined in the Davis-Grunsky contract¹¹) and are moderately higher than the FERC staff-recommended flow schedule, which ranges from 120 cfs to 175 cfs. The FERC flow schedule is lower in this time period based, in part, on analyses in the 2015 Final EIS that show greater amounts of “instream physical habitat” for spawning and rearing (estimated by WUA) at lower flow levels.

Notwithstanding the 2015 Final EIS, more recent information demonstrates that higher flows are needed. The 2018 SED shows that higher instream flows during February through June are associated with higher juvenile Chinook salmon survival and a recent (2019¹²) evaluation of juvenile Chinook salmon survival data on the Stanislaus River shows that juvenile abundance decreased with increased instream physical rearing habitat as estimated by WUA. This occurs because WUA modeling estimates are maximized at relatively low flows (e.g., 75 cfs), whereas spawner and juvenile data show that higher juvenile survival occurs during times of higher flows rather than increased WUA. The same analysis shows that higher instream flows have a stronger (relative to WUA) positive relationship with spawning success. In addition, the analysis found that temperatures during spawning and early incubation (i.e., October to November) had the greatest impact on juvenile production. It is anticipated that implementing Condition 1.D. flows will result in greater flow rates in the February through June months and could potentially increase flows from July – January if adaptive implementation methods are approved and applied during these months during a given year. In addition to flows improving habitat for fish, it is anticipated that cold water habitat will be improved by lower water temperatures as a result of implementation of certification conditions (e.g., Condition 3, Condition 8A, and other temperature management requirements).

Condition 1.B includes minimum flow requirements at the Department of Water Resources’ Merced River at Stevinson (MST, River Mile 4.5) gage¹³ in response to dry river conditions experienced in the Merced River in recent years. The Merced River

¹¹ The Davis-Grunsky contract flows are based on the Lake McClure water year type established in the 1964 FERC license. This method relies on the prior May 1st DWR Bulletin 120 forecast of unimpaired inflow to Lake McClure from April through July; if it was greater than 450 TAF then the November through March minimum flow was 220 cfs (normal), and if it was less than 450 TAF then the minimum flow was 180 cfs (dry). For incorporation into this certification, Davis-Grunsky contract flow requirements were converted to the Merced 60-20-20 water year types by reviewing historical Bulletin 120 documents from 1960 to 2015. The normal Davis-Grunsky contract flow of 220 cfs is applied in Wet, Above Normal, and Below Normal water years; and the dry Davis-Grunsky contract flow of 180 cfs is applied in Dry and Critically Dry water years.

¹² Independent Science Advisory Panel. 2019. Final Report. Developing Goals for the Bay-Delta Plan: Concepts and Ideas from an Independent Science Advisory Panel. April 2019.

¹³ DWR’s MST gage represents the closest gage to the confluence of the Merced and San Joaquin Rivers.

experienced a dry river channel during the summer periods of 2016 and 2022, and the MST flow gage recorded periods of zero flow during December 2016 and January 2017. Dry season instream flow requirements at the MST gage from July through January will ensure flow conditions that will prevent the river from running dry, maintain connectivity through the Merced River to the confluence with the LSJR, and contribute to achieving basic ecological processes such as sustaining riparian vegetation. Given seasonal differences in hydrology and baseflows, a separate summer dry season (July – September) minimum instream flow of 66 cfs and fall-winter dry season (October – January) minimum instream flows of 150 cfs are required at MST. Additionally, Condition 1 provides for changes to compliance gages or their locations with Deputy Director approval to account for potential updates to the parties that oversee gages, access issues, or other factors that impact gaging during the term(s) of the new FERC license(s) for the Merced Projects.

The fall-winter dry season baseline minimum instream flow requirement of 150 cfs reflects the lowest 5th percentile monthly average daily flow observed from January 2000 to October 2024. The 5th percentile is used instead of the observed minimum flow to avoid any extreme outliers that may have occurred in the record (e.g., drought emergencies and 2016-17 winter). For the summer dry season minimum instream flow requirement, the 5th percentile calculation is not used because it is expected that the 5th percentile flow will not maintain perennial flow and a connected river. Instead, the summer dry season requirement is based on recommendations by the National Marine Fisheries Service (NMFS). On March 1, 2023, NMFS submitted a letter to the State Water Board that included a flow recommendation of 66 cfs in the Merced River near its confluence with the LSJR to protect essential fish habitat, fish passage, and ecological processes. (NMFS, 2023)

6.1.3 Rationale for Condition 1.C: Pulse Flows

Condition 1.C requires implementation of the pulse flows identified in the Final EIS with one modification to provide for more flexible implementation of the pulse flow made in response to CDFW comments received on July 16, 2020. The FERC staff recommendation includes spring pulse flows from March – May. The pulse flow was modified to include the month of February to increase flexibility to use pulse flows when they may be most effective. It is anticipated that the flows required in Condition 1.D will provide greater volumes of water in the spring than the combination of Condition 1.B flows and Condition 1.C flows. Further, the fall pulse flows are consistent with Merced ID's amended water rights licenses, discussed above. Pulse flows aim to mimic seasonal high flow events that provide important biological cues. For example, during the fall, specifically in October or November, pulse flows will help to attract adult native migratory fish to the mouth of the Merced River and stimulate upstream migration to the primary spawning area between Crocker-Huffman diversion dam and Shaffer Bridge. In the spring, if timed appropriately, pulse flows stimulate native migratory fish outmigration prior to stressful summer flow and temperature conditions. In addition, pulse flows provide important geomorphic benefits, such as mobilizing spawning gravel and flushing sediment. Absent high flow events, especially in dry water years, river reaches can accumulate fine grained sediments, decreasing the amount of available

spawning habitat. Furthermore, pulse flows and a more natural flow regime will better support aquatic life by maintaining or improving aquatic habitat. Pulse flows are needed to consistently inundate floodplains for a stretch of time, particularly during the spring, thereby providing rearing and foraging habitat for juvenile native resident and migratory fish in overbank areas. Pulse flows also stimulate growth and reproduction of floodplain vegetation that provides protective cover for juvenile native resident and migratory fish and additional shade to the channel during warmer months when water temperature limits the suitability of native fish habitat in the Lower Merced River.

6.1.4 Rationale for Condition 1.D: Bay-Delta Plan Lower San Joaquin River Flows

Condition 1.D requires implementation of the Bay-Delta Plan's LSJR flow objectives, which are both narrative and numeric, to reasonably protect native fish and wildlife beneficial uses in the LSJR watershed to the Sacramento – San Joaquin Delta (Delta). The narrative objectives require, in part, maintaining inflow conditions from the LSJR watershed to the Delta at Vernalis that are sufficient to support and maintain the natural production of viable native LSJR watershed fish populations migrating through the Delta. The numeric objective requires flows that more closely mimic natural hydrograph conditions. The program of implementation for the flow objectives provides flexibility for the flows to be adjusted, shaped, or shifted, if information supports that adaptively implementing the flows better achieves the narrative goal of supporting native LSJR watershed fish populations.

The LSJR watershed once supported large spring-run and fall-run (and possibly late fall-run) Chinook salmon populations; however, it is widely thought that the watershed now only supports fall-run Chinook salmon populations, and these populations are at risk. Reduced flow is recognized as a primary driver of the decline of riverine ecosystem conditions and fish species abundance and distribution in the LSJR watershed, including the Merced River. Nearly every feature of habitat that affects native fish and wildlife is, to some extent, determined by flow (e.g., temperature, water chemistry, and physical habitat complexity). The LSJR flow objectives are necessary to protect fish and wildlife beneficial uses in the LSJR watershed.

The program of implementation for the flow objectives allows adaptive implementation of the percent of the unimpaired flow requirement. When specific criteria are met as outlined in the Bay-Delta Plan, adaptive implementation methods allow the magnitude and timing of flows to be adjusted within 30–50 percent of the unimpaired flow range, applied as a total volume of water with an alternative flow schedule that results in better protection of fishery resources than rigidly following the unimpaired flow value on a seven-day running average, and/or that a portion of the total February through June required volume may be shifted to a different month (July – January) to avoid adverse impacts to fish and wildlife resources. In addition, non-flow measures could improve habitat conditions for fish and wildlife, which may support a change in the required percent of unimpaired flow, within the prescribed range, or other adaptive adjustments that may collectively reduce the water supply and economic effects resulting from implementing the 2018 Bay-Delta Plan.

Adaptive implementation of flow is intended to accomplish the following goals:

- Maximize fisheries benefits at potentially lower water cost.
- Respond to changing information and changing conditions, including changes in flow patterns from climate change.
- Minimize adverse water temperature effects.
- Support scientific experiments that assess the benefits of different flow regimes and other habitat improvements.

Merced River flows that meet the February – June LSJR flow objectives are greater than the baseflows and pulse flows identified in Conditions 1.B and 1.C. The higher flows required by Condition 1.D support achieving temperature criteria in Condition 8.A. Table 3 during the February through June time period and potentially contribute to meeting temperature criteria from July through November depending on State Water Board approval and application of adaptive implementation methods. The 2018 SED provides the scientific basis for requiring LSJR numeric flow objectives for the reasonable protection of native fish and wildlife beneficial uses. The 2018 SED shows that flows greater than baseline and the FERC staff recommendation are needed to provide reasonable protection for LSJR native resident and migratory fish species. Accordingly, this certification includes Condition 1.D that requires Merced ID to meet the Merced River portion of the LSJR flow objective near the confluence of the Merced River with the LSJR. Condition 1.D also acknowledges that the Bay-Delta Plan allows for the LSJR flow objective to be implemented as a total volume of water that can be applied adaptively within and outside the February through June time period to achieve the best biological outcome while reducing water supply impacts.

Potential voluntary agreements are being negotiated to implement the Bay-Delta Plan's water quality objectives related to the protection of native fish and wildlife. Robust voluntary agreements can help inform and facilitate implementation of the LSJR flow objectives and provide coordinated solutions in the Bay-Delta watershed while also providing reasonable protections for fish and wildlife. Incorporation of the terms of any voluntary agreement will be evaluated through the process(es) identified in the Bay-Delta Plan and the State Water Board will consider whether the agreement will help achieve the water quality objectives, help protect the beneficial uses, and be enforceable through State Water Board action. Depending on the scope of potential future voluntary agreement proposals, amendments to the certification may be necessary.

Subject to acceptance by the State Water Board, the Bay-Delta Plan expressly allows the use of a voluntary agreement as a means of implementing the LSJR flow objectives. A voluntary agreement may serve as an implementation mechanism for the LSJR tributaries as a whole, an individual tributary, or some combination thereof. Voluntary agreements may include commitments to meet the flow objectives and to undertake non-flow actions. At a minimum, to be considered by the State Water Board, voluntary agreements must include provisions for transparency and accountability, monitoring and reporting, and for planning, adaptive adjustments, and periodic evaluation, that are

comparable to similar elements contained in the program of implementation for the LSJR flow objectives.

Future updates to the Bay-Delta Plan may also be approved by the State Water Board to include specific provisions for voluntary agreements as a means of implementing the water quality objectives for the protection of fish and wildlife beneficial uses. As stated in Condition 35 (compliance with the Bay-Delta Plan and SR/SJR Basin Plan) and Condition 34 (compliance with other applicable standards and plans), the Merced Projects must be operated in a manner consistent with all applicable water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act.

6.1.5 Rationale for Condition 1.E: Compliance Methods

Compliance methods for baseflows, pulse flows, and LSJR flow objectives are needed to track and account for flows, including flows that are used as a volume or “block” of water to comply with the LSJR flow objectives. Implementing the LSJR percent of unimpaired flow requirement requires development of methods to monitor and evaluate compliance. Flow objectives in water quality control plans and permits have traditionally been established as flow schedules by water year type with flows established at a fixed flow rate in cfs for a stated time period (e.g., monthly, 30-days, 14-days, or some other specific time increment). Similarly, compliance methods that track and account for flows that are established as a block or volume of water, such as pulse flows or LSJR flow objectives using adaptive implementation methods, need to be established and approved by the State Water Board. These actions are necessary to demonstrate compliance with flow requirements in Conditions 1.B, 1.C, and 1.D.

6.1.6 Rationale for Condition 1.F: Annual Operations Plans

Condition 1.F requires the development of annual operations plans to promote comprehensive water resource management, including efficient and effective management of water resources for water supply and biological beneficial uses. The annual operations plans must address implementation of the flows identified in Conditions 1.B, 1.C, and 1.D, ramping rates in Condition 2, and carryover storage requirements in Condition 3. Annual operations plans will be developed based on a forecast, or multiple forecasts, of the best available information but may not accurately reflect actual precipitation and snowpack conditions that occur as the water year progresses. Accordingly, annual adaptive operations plans may need to be modified as the year progresses and information about available water supply improves. The process of developing an annual adaptive operations plan supports tracking operations decisions and identifying potential deviations from the approved plan as the water year progresses, such that proposed modifications can be submitted for approval, if necessary.

The Bay-Delta Plan requires annual adaptive operations plans to identify adaptive implementation actions for achieving the LSJR flow objectives. The annual operations plan required under Condition 1.F may be used to fulfill the Bay-Delta Plan’s

requirements for annual adaptive operations plans as long as the Bay-Delta Plan's requirements are met.

6.1.7 Rationale for Condition 1.G: Dry Year Management Operations Plan

Developing and implementing a Dry Year Management Plan is important for successful management of water resources to protect all beneficial uses in California's extremely variable climate, which includes extended drought. Multiple, successive dry years present difficult choices between releasing reservoir water to meet immediate demands (deliveries and instream flow requirements) or storing reservoir water for a future year to address the risk of additional dry year(s). The Dry Year Management Plan should identify available strategies for managing the need to release water from storage to fulfill seasonal water demand with the need to retain water in storage for future demand.

6.2 Rationale for Condition 2 – Ramping Rates

Project operations can cause abrupt flow and stage fluctuations in the Merced Projects-affected reaches. These fluctuations and the rate at which they occur (i.e., ramping rate) may strand or otherwise impact aquatic species. Condition 2 requires Merced ID to develop and implement a Ramping Rate Plan, in consultation with the Merced River Watershed Group, to avoid rapid changes in river flow that may adversely impact aquatic life.

6.3 Rationale for Condition 3 – Carryover Storage Requirements

Carryover storage refers to the quantity of water stored in a reservoir at the end of a season or water year (i.e., September 30). Where reservoir operations could impact fish and wildlife, storing an amount of cold water in a reservoir is often referred to as a cold-water pool. Carryover storage requirements that help manage the cold-water pool in Lake McClure are needed to preserve cold water that can help provide suitable water temperatures for Chinook salmon, steelhead, and other native fish species that rely on cold water habitat.

Lake McClure inflow temperatures serve as an indicator of the temperatures that salmon would be able to access during the fall spawning period without the presence of the dams (i.e., Crocker-Huffman diversion dam, Merced Falls Dam, McSwain Dam, New Exchequer Dam) that currently block migration. As illustrated in Figure F.1.6-7a and elsewhere in Appendix F.1 of the State Water Board's 2018 SED, Lake McClure storage volumes affect water release temperatures from the reservoir. The water temperature impacts associated with releases from Lake McClure extend and get amplified as the Merced River flows downstream through additional dam complexes, until the water is released below Crocker-Huffman diversion dam, the current limit of anadromy on the Merced River. Warm water releases are most acute in the fall (i.e., during September through November) when adult salmon are migrating into the Merced River and spawning. Furthermore, Figure 19-7 of Chapter 19 of the State Water Board's 2018 SED shows that the water temperatures necessary for spawning salmon (i.e., less than 55.4 degrees Fahrenheit [°F]) are delayed by approximately one month on average

during the fall-run Chinook salmon spawning time period when comparing Lake McClure inflow temperatures relative to Crocker-Huffman diversion dam release temperatures. This approximately one-month delay in access to optimal spawning temperatures likely affects egg viability, and potentially shortens the overall window of opportunity available to juvenile salmon for successful development and migration prior to ocean entry.

In addition to ensuring cold water is preserved and provided to native fish species, carryover storage requirements also provide the benefit of improving water delivery reliability, especially during sequential dry years and drought conditions. No reliable forecast exists that can predict hydrologic conditions for the upcoming water year. This means that reservoir operators must assume that conditions for the coming water year could range from drought to flood. For this reason, prudent reservoir operations include consideration and planning to ensure some degree of protection of existing and future water supplies in the event of dry conditions. Maintaining sufficient reservoir carryover storage levels helps to ensure water will be available for multiple beneficial uses during droughts.

The Bay-Delta Plan recognizes that implementing the LSJR flow objectives requires the development and implementation of minimum reservoir carryover storage levels. Maintaining adequate carryover storage helps to avoid significant adverse temperature or other impacts on fish and wildlife or, if feasible, on other beneficial uses. Adequate carryover storage levels allow for the consideration of fish and wildlife beneficial uses year-round while focusing the LSJR flow objectives on the season that is most important to early life stages of several fish species.

6.4 Rationale for Condition 4 – Extremely Dry Conditions

California's history of drought illustrates the importance of planning for multiple dry years or drought. It is difficult to anticipate the specific impacts of consecutive dry years or a long-term drought and identify where limited water supplies may be best used during times of shortage. Condition 4 allows Merced ID to submit a request for Deputy Director approval of a Revised Operations Plan to address water shortage issues during consecutive Dry or Critically Dry water year types or drought years. This condition provides flexibility for adaptive implementation during times of extreme water shortage.

The Bay-Delta Plan includes an emergency provision, which applies if the State Water Board determines the existence of an emergency as defined in CEQA or the Governor declares a state of emergency under the California Emergency Services Act and the LSJR flow requirements affect or are affected by the conditions of the emergency. The Governor's power to declare an emergency is not limited to statewide emergencies, but encompasses emergencies that are regional or local in nature. Under the Bay-Delta Plan's emergency provision, the State Water Board may approve a temporary change in the implementation of the LSJR flow objectives. With respect to drought conditions, however, most are not declared emergencies and are to be accommodated through the adaptive implementation methods allowed in in the Bay Delta Plan for the LSJR flow objectives. The Bay-Delta Plan's emergency provision cannot be used to routinely relax

implementation of flow requirements but is reserved for true emergencies. The Bay-Delta Plan's emergency provision includes a requirement for the State Water Board to find that measures will be taken to reasonably protect fish and wildlife beneficial uses in light of the circumstances of the emergency.

6.5 Rationale for Condition 5 – Southern Delta Salinity

One of the primary water quality concerns in the southern Delta is salinity, particularly for agricultural water users. The Bay-Delta Plan establishes a year-round water quality objective of 1.0 dS/m EC at Vernalis and in the southern Delta for the protection of agricultural beneficial uses.

Before 2018, the Bay-Delta Plan set a water quality objective at the three interior southern Delta compliance stations and Vernalis of 0.7 milliMhos per centimeter (mmhos/cm) (units of mmhos/cm are equal to units of dS/m) during the summer irrigation season and 1.0 mmhos/cm from September to March. Under their water right permits as amended by Water Right Decision 1641 (2000), DWR and the United States Bureau of Reclamation (Reclamation) are responsible for meeting this salinity requirement at the three interior southern Delta compliance stations and Reclamation is responsible for meeting the requirement at Vernalis. The 2018 Bay-Delta Plan set a year-round objective of 1.0 dS/m, but as part of the amendments, the State Water Board determined that salinity at Vernalis during the summer irrigation season should remain 0.7 dS/m to provide assimilative capacity for salinity in the southern Delta and ensure attainment of the 1.0 dS/m water quality objective.

Salinity control in the southern Delta is complicated due to a variety of factors. The San Joaquin River, which flows into the southern Delta, carries a heavy salt load from upstream, primarily associated with discharges from agricultural lands on the west side of the river, served with Reclamation's Central Valley Project (CVP) water. In addition, due to upstream water infrastructure development, flows in the San Joaquin River and its tributaries are lower than they were historically. Complex southern Delta circulation issues, shallow saline groundwater, the export pumps of the CVP and DWR's State Water Project (SWP), and hundreds of diversions further complicate the salinity issues. It is reasonable to consider the responsibility of other entities besides Reclamation and DWR for implementing the southern Delta salinity objective as more information becomes available.

The Bay-Delta Plan's LSJR flow objectives and southern Delta salinity objective are complementary. The diversion of water and associated reduction in streamflow contributes to increased salinity. Increased flows under the LSJR flow objectives provide the incidental benefit of a lower salinity irrigation water supply to flush salts early in the irrigation season, and thus provide better salinity conditions during spring germination of crops, which is generally the most salt-sensitive time. The complementary nature of both objectives provides a comprehensive means to put the state's water resources to beneficial use to the fullest extent possible.

6.6 Rationale for Condition 6 – Merced River and Regional Watershed Groups

Optimizing the timing of flows to meet instream flow and other requirements, while also considering other beneficial uses as long as intended benefits to fish and wildlife are not reduced, requires coordination with many parties. Accordingly, Condition 6 requires the formation of the Merced River Watershed Group, as well as a subcommittee focused on fishery resources – the Merced River Anadromous Fish Committee – to coordinate Merced River-specific information and activities. Condition 6 also requires broader coordination through the Lower San Joaquin River Watershed Group recognizing watershed partners on the Lower San Joaquin River and its tributaries need to be coordinated in their flow and non-flow actions to achieve the provisions of the Bay-Delta Plan. Parties identified for participation in such coordination include Merced ID, water operators, stakeholders, and agencies with expertise on the Merced River and LSJR watershed related to fisheries management, hydrology, water operations, monitoring, and assessment. Coordination is intended to maximize the beneficial uses of the state’s waters and to assist with implementation, monitoring, and assessment of the certification conditions.

Participation in a LSJR watershed coordination group is necessary to assist with implementation of certification conditions, coordinate flows in the LSJR watershed to support native resident and migratory fish species, integrate monitoring efforts, and assess the effectiveness of certification conditions and water quality standards, including the February through June LSJR flow objectives. The Bay-Delta Plan identifies the formation of the Stanislaus, Tuolumne, and Merced Working Group (STM Working Group) as a watershed group to provide recommendations regarding multiple requirements of the Bay-Delta Plan such as: biological goals; procedures for implementing the adaptive methods described above in section 6.1.4; annual adaptive operations plans; and the San Joaquin River Monitoring and Evaluation Program, including special studies and reporting requirements. Recognizing that naming conventions may change over time, a watershed group identified by a name different than “STM Working Group” that performs the same functions and complies with the same requirements as the STM Working Group is considered functionally equivalent to the STM Working Group for the purposes of consistency with the Bay-Delta Plan’s requirements and this condition.

6.7 Rationale for Condition 7 – Annual Review Meeting

Monitoring plans and studies required by this certification will help resource agencies and State Water Board staff evaluate benefits and impacts associated with implementation of new license(s) conditions on hydrological, biological, and geomorphological resources affected by the Merced Projects throughout the term of the license(s) and any extensions. Annual consultation meetings bring resource agencies and interested stakeholders together to discuss monitoring results and resource trends, and develop adaptive management actions, if necessary, to protect water quality and beneficial uses. Condition 7 requires Merced ID to conduct annual consultation meetings with resource agencies and other interested stakeholders to review monitoring reports and discuss ongoing and forecasted operations, including revisions or

modifications to monitoring and/or operations that may be needed to protect water quality and beneficial uses.

6.8 Rationale for Condition 8 – Water Quality Monitoring and Management

The Merced River is listed on the Clean Water Act 303(d) list as impaired for water temperature, dissolved oxygen, mercury, Group A pesticides, and unknown toxicity. Lake McClure and McSwain Reservoir are listed on the 303(d) list as impaired for mercury. Elevated water temperatures and depressed dissolved oxygen levels significantly reduce habitat suitability for native resident and migratory fish downstream of Crocker-Huffman diversion dam. On the Merced River, water temperature below the Merced Projects is largely controlled by reservoir storage volumes, flow releases from the reservoirs, and flow diversions. These factors can also affect dissolved oxygen concentrations downstream.

Water temperature and dissolved oxygen are primary drivers of the productivity and survival of native resident and migratory salmonids. Water temperature is crucial to aquatic organisms because it directly influences their metabolism, respiration, feeding, behavior, growth, and reproduction. Most aquatic species have an optimal temperature range for growth and reproduction, and they are also bound by upper and lower temperature limits in which they can no longer survive or successfully reproduce. Temperature and dissolved oxygen are intrinsically linked in the aquatic environment (i.e., as water temperatures increase, biochemical demand for oxygen increases such that fish need more oxygen, and as water temperatures increase the solubility of oxygen decreases such that there is less dissolved oxygen available for fish).

As noted earlier in the certification, Lake McClure and McSwain Reservoir have been identified as impaired for mercury. Mercury is a potent neurotoxicant that is toxic to humans, wildlife, and fish, and mercury pollution negatively impacts the beneficial uses of many waters of the state. Fish collected from the Merced River, Lake McClure, and McSwain Reservoir have fish tissue mercury concentrations that exceed safety thresholds to protect fish health, as well as exceed water quality objectives for the protection of human and wildlife consumers of fish. Although mercury occurs naturally in the environment, the Merced Projects' operations exacerbate fish mercury concentrations. On May 2, 2017, the State Water Board adopted Resolution No. 2017-0027, which approved *Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California—Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions*. (State Water Board, 2017a) Resolution No. 2017-0027 provides a consistent regulatory approach throughout the state by setting mercury limits to protect the beneficial uses associated with the consumption of fish by both people and wildlife.

The development and implementation of a Water Temperature Monitoring and Management Plan is required to ensure actions are implemented to provide suitable cold water habitat, which is necessary for Chinook salmon, steelhead, and other cold-water native fish species downstream of the Merced Projects. As demonstrated in Figure F.1.6-7a and elsewhere in Appendix F.1 of the State Water Board's 2018 SED,

reservoir storage volumes in Lake McClure affect the temperature of water released from the reservoir. The temperature of water released from Lake McClure affects water temperatures further downstream, including below Crocker-Huffman diversion dam during September through November when adult salmon are migrating into the Merced River and spawning. Figures F.1.6-7b through F.1.6-7e and elsewhere (e.g., Figure F.1.6-53) in Appendix F.1, as well as information in Chapter 19 and Master Response 3.1 from the State Water Board's 2018 SED, provide information showing relationships between the amount of flow in the Merced River below the Merced Projects and water temperatures. This information demonstrates that during much of the year increased flows provides additional cold-water habitat.

The availability of water temperatures necessary for spawning salmon (less than 55.4°F or 13°C) is delayed approximately one month during the fall-run Chinook salmon spawning period when comparing Lake McClure inflow temperatures to Crocker-Huffman diversion dam release temperatures, see Figure 19-7 of the State Water Board's 2018 SED. Lake McClure inflow temperatures serve as an indicator of the temperatures that salmon would be able to access during the fall spawning period without the presence of the dams that are currently blocking migration (i.e., Crocker-Huffman diversion dam, Merced Falls Dam, Lake McSwain Dam, New Exchequer Dam). Water temperatures less than 55.4°F are often available for release at the low level intake in Lake McClure (Figure 3-9 through 3-11 of the 2015 Final EIS and Figures 17 and 19 in Vogel 2007¹⁴), which shows that cold water necessary for spawning salmon in the fall time period is available if it can be more efficiently managed and delivered to the spawning reaches or if fish passage is developed to bring salmon further upstream so they have access to the cold water released from Lake McClure.

Condition 8 requires Merced ID to meet temperature criteria in Table 2 (or as modified in an approved management plan) within its reasonable control through development and implementation of a Water Temperature Monitoring and Management Plan. Condition 8 also requires MID to develop and implement a Dissolved Oxygen Management Plan, a Mercury Monitoring and Management Plan, and an Other Constituents Monitoring and Management Plan. The plans must be developed in consultation with the Merced River Anadromous Fish Committee, the Merced River Watershed Group, and appropriate state agencies. These plans are needed to protect water quality and the beneficial uses of water described in the Bay-Delta Plan and the SR/SJR Basin Plan.

The temperature criteria identified in Table 2 are needed to help ensure operation of the Merced Projects will comply with state water quality requirements including the salmon protection objective in the Bay-Delta Plan. The salmon protection objective states that, "water quality conditions shall be maintained, together with other measures in the watershed, sufficient to achieve a doubling of natural production of Chinook salmon

¹⁴ Vogel, D.A. 2007. A feasibility investigation of reintroduction of anadromous salmonids above Crocker-Huffman dam on the Merced River. Natural Resource Scientists, Inc., Red Bluff, CA. December 2007.

from the average production of 1967 – 1991, consistent with provisions of State and federal law.”¹⁵ On the Merced River, the doubled natural production of the average production of Chinook salmon from 1967-1991 is 18,000 fish¹⁶ which is an estimated escapement (returning adults) of approximately 8,000 fish.¹⁷

As described in this section, water temperature in the Merced River downstream of the Merced Projects is a limiting factor for the spawning and rearing life stages of Merced River salmonids. The Merced Projects increase downstream river temperatures, delay arrival of cold water to spawning habitat, and block fish species from moving upstream to colder spawning and rearing habitats. Accordingly, the Merced Projects are responsible for water temperature impairments and related impacts to beneficial uses associated with the construction and ongoing operation of the Merced Projects. Improved temperature associated with implementation of the Temperature Monitoring and Management Plan will help ensure salmonid habitat with temperature conditions that promote survival and contribute to achieving the salmon protection objective and compliance with water quality standards in the Bay-Delta Plan.

Temperature criteria in Table 2 are based on USEPA recommended temperature criteria for protection of salmonids¹⁸ and information provided and analyzed in the 2018 SED.¹⁹ Available information indicates that improving temperature conditions for fish species on the Merced River may require a combination of increased river flow, reservoir storage management, and infrastructure actions. Accordingly, multiple actions could be available to mitigate the temperature impact to salmonid habitat caused by the Merced Projects. Merced ID must identify and develop cold water management solutions that provide suitable temperatures for freshwater life stages of salmonids, which should include evaluation of protecting cold water reserves with sufficient reservoir storage volumes and construction of infrastructure solutions such as selective reservoir withdrawal structures, cold water bypasses, fish passage, water chillers, and other infrastructure that help provide native fish with the cold water habitat that fish need

¹⁵ Bay-Delta Plan (State Water Board 2018b), Table 3, page 14. Available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf (Accessed: January 31, 2025)

¹⁶ USFWS. (2001). Final Restoration Plan for the Anadromous Fish Restoration Program; A Plan to Increase Natural Production of Anadromous Fish in the Central Valley California. Prepared for the Secretary of the Interior by the United States Fish and Wildlife Service with assistance from the Anadromous Fish Restoration Program Core Group under authority of the Central Valley Project Improvement Act. January 9, 2001.

¹⁷ Mills and Fisher (1994) Central Valley Anadromous Sport Fish Annual Run-Size, Harvest, and Population Estimates 1967 through 1991.

¹⁸ USEPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. April 2003. USEPA 910-B-03-002. 49 pp.

¹⁹ Chapter 19 Analyses of Benefits to Native Fish Populations from Increased Flow between February 1 and June 30.

and are needed to achieve the Merced River components of the salmon protection objective.

Information gathered from implementation of the plans required by Condition 8 will be used to evaluate the effects of actions related to the Merced Projects on water quality, and to identify, assess, and adaptively manage potential adverse water quality impacts.

6.9 Rationale for Condition 9 – Large Woody Material Management

Large woody material contributes to productive aquatic ecosystems and is an important component of stream channel maintenance and the formation of complex aquatic habitat both along stream margins and in active river channels. Large woody material provides cover and holding habitat for native resident and migratory fish and organic matter that supports the aquatic food web. Large woody material in tributaries of the upper watersheds is carried progressively downstream during high flow events. Prior to the construction of the Merced Projects' dams, high flow events would distribute large woody material from the upper watersheds throughout reaches downstream of the Merced Projects. Presently, the Merced Projects prevent most incoming large woody material from entering the Merced River downstream of Merced Falls Dam. The large woody material is instead impounded by the Merced Projects' reservoirs. For this reason, large woody material of the size capable of influencing channel morphology is largely absent in the Lower Merced River downstream of Merced Falls Dam.

Condition 9 requires Merced ID to develop and implement a Large Woody Material Management Plan (LWMMP) in consultation with BLM, USFWS, NMFS, CDFW, California Department of Transportation (Caltrans), and State Water Board staff. The LWMMP will specify large woody material augmentation procedures and associated monitoring to assess the effectiveness of its implementation in transporting and distributing large woody material throughout the Merced River below Merced Falls Dam.

6.10 Rationale for Condition 10 – Erosion and Sediment Management

Erosion and sedimentation can contribute to degradation of the waters of the state; therefore, it is necessary to implement actions to limit or eliminate such discharges to protect water quality and associated beneficial uses. Project construction has the potential to cause erosion that could impact the Merced River and its tributaries. Increases in erosion can violate water quality objectives (e.g., turbidity) and impact beneficial uses. Beneficial uses of the Merced River that could be impacted by increased erosion and sedimentation include, but are not limited to: warm freshwater habitat; cold freshwater habitat; and water contact recreation. Additionally, the Merced Projects reduce the frequency of seasonal high flow events in river reaches below the Merced Projects' dams that facilitate the transport of fine sediment. Accumulation of fine sediment can degrade water quality and adversely affect fish spawning and incubation success.

To manage existing erosion and minimize future erosion and sediment delivery to the Merced Projects stream reaches and reservoirs, Condition 10 requires Merced ID to

develop and implement an Erosion and Sediment Management Plan (Erosion and Sediment Plan) in consultation with BLM, CDFW, USFWS, NMFS, and State Water Board staff. The Erosion and Sediment Plan will describe methods to inventory, assess, remediate, and monitor erosion sites, and outline site-specific temporary erosion control measures to be implemented during construction and maintenance activities.

6.11 Rationale for Condition 11 – Gravel Augmentation

Relicensing studies identified the need for gravel augmentation in the Merced River below Crocker-Huffman diversion dam. The Merced Projects' reservoirs trap gravel originating from upstream sources. This limits available gravel that supports and enhances aquatic habitat in the Merced River. The Merced River, downstream of Crocker-Huffman diversion dam, exhibits degraded habitat due to the Merced Projects' operations. This degraded habitat is characterized by a coarsening of the bed surface and reduction in the frequency and quantity of gravel deposits. Coarsening of the bed surface reduces the habitat suitability of spawning reaches, resulting in a reduction in the survival of fish eggs. Good quality coarse gravel provides substrate for growth of algae and invertebrates, which are important for the aquatic food web.

Condition 11 requires Merced ID to develop and implement a Gravel Augmentation Plan in consultation with BLM, CDFW, USFWS, NMFS, and State Water Board staff. The Gravel Augmentation Plan will require addition of gravel to the Merced River below Crocker-Huffman diversion dam, as well as gravel mobilization monitoring. The Gravel Augmentation Plan must consider the gravel amounts and placement schedule NMFS recommended to FERC (NMFS, 2014; NMFS, 2016). NMFS recommended sourcing aggregate material from areas along the banks of Merced River where future restoration projects (Condition 12) could be located. As aggregate material is harvested along the streambanks for gravel augmentation activities, new floodplain areas may be created.

6.12 Rationale for Condition 12 – Riparian and Floodplain Improvements

The Merced Projects have altered the hydrology and natural geomorphic processes along the Merced River corridor. The Merced Projects' dams block sediment recruitment from the upstream basin and have changed the high flow frequencies, caused channel incision, altered peak flows, decreased winter flows, increased summer flows, and changed ramp down rates. The depletion of sediment loads reduces the formation of sediment benches, which affects riparian colonization and succession. Natural floodplain inundation has been greatly reduced in the Merced River corridor.

Floodplain habitats in the Central Valley have been found to have a positive effect on the growth of juvenile native resident and migratory fish, and larger and faster growth has been associated with increased survivorship in the river and to adulthood. The higher growth rates are largely attributed to greater productivity and availability of prey in the floodplains. Riparian habitats also provide allochthonous food sources and shading, which provides temperature benefits and cover to help protect juvenile native resident and migratory fish from predators. Floodplain habitats provide a migratory corridor and refuge from predatory species.

The need for the development and enhancement of riparian and floodplain habitats is consistent with the Bay-Delta Plan Program of Implementation to support and protect aquatic-life beneficial uses. The inclusion of the development and enhancement of riparian and floodplain habitats will maximize the benefits to native species from the instream flow requirements in Condition 1. Additionally, riparian and floodplain improvement efforts should be coordinated with related efforts, such as gravel augmentation (Condition 11) and large woody material augmentation (Condition 9).

6.13 Rationale for Condition 13 – Predator Suppression

Predation has been identified as one of the multiple stressors that adversely impacts the survival of juvenile native resident and migratory salmonids. The Merced Projects' operations contribute to increased predation pressure on juvenile native resident and migratory fish. For example, increased water temperatures increase the presence of warm-water predatory species, and reduced water velocities increase the presence of submerged aquatic vegetation, which supports predatory species. In addition, other physical conditions in the river likely increase predation exposure to native resident and migratory fish (e.g., gravel pits, diversion dams, and lack of cover). There is large uncertainty in the magnitude of the impact of predation on native salmonid populations, especially the role of predation as a proximate or ultimate cause of mortality to native salmonids. The implementation of non-flow actions such as predator suppression to increase native salmonid survival is necessary to bolster native salmonid populations and is consistent with the Bay-Delta Plan.

6.14 Rationale for Condition 14 – Aquatic Invasive Species Management

Recreational boating opportunities at the Merced Projects' reservoirs have the potential to cause the proliferation of aquatic invasive species. Visitors from different areas provide the potential for a large number of aquatic invasive species to colonize Merced Projects-affected waters and potentially impact beneficial uses. If not properly managed, the use of contact recreational equipment can introduce aquatic invasive species that can deleteriously affect water quality, outcompete native fauna and flora, and degrade the Merced Projects' infrastructure.

Aquatic invasive species have the potential to cause adverse impacts to native species in the river. Floating and submerged aquatic vegetation can degrade water quality (e.g., depress dissolved oxygen) and support non-native predators. In addition to the increase of predation pressure by non-native species, invasive species can compete against native species for limited resources.

Condition 14 requires Merced ID to develop and implement a Merced Projects-specific aquatic invasive species plan that includes a public education program for the Merced Projects recreation facilities. The plan also must include monitoring for early detection of aquatic invasive species vectors to minimize the risk of aquatic invasive species becoming established in the Merced Projects waters.

6.15 Rationale for Condition 15 – Merced National Wildlife Refuge

The Merced National Wildlife Refuge (NWR) is located about 30 miles southeast of McSwain Dam and is part of the San Luis NWR Complex. It encompasses 10,262 acres of wetlands, native grasslands, vernal pools, and riparian areas and was established in 1951 under the federal Lea Act (16 U.S.C. §695–695c; 62 Stat. 238) to attract wintering waterfowl from adjacent farmland where their foraging was causing crop damage.

The existing FERC license requires that Merced ID provide the USFWS with up to 15,000 AF of water from the Merced River Project and return flow for the Merced NWR. The FERC staff recommendation includes development of a water delivery plan to ensure delivery of 15,000 AF to the Merced NWR. Condition 15 requires Merced ID to develop and implement a plan to continue water deliveries to the Merced NWR during times of the year when the 15,000 AF of water would provide the most benefit to wildlife.

6.16 Rationale for Condition 16 – Recreation Facilities Management

Operations and maintenance activities associated with the Merced Projects' recreation facilities have the potential to impact water quality. A list of existing recreational facilities can be found in Appendix A. As part of relicensing the Merced Projects, Merced ID is proposing improvements to recreational facilities through the reconstruction of existing facilities and the construction new recreational facilities. Construction of new recreation facilities, modification of existing recreation facilities, or other ground-disturbing activities could increase soil erosion and fine sediment delivery to the Merced Projects' waterways. Fine sediment can adversely affect water quality and associated aquatic habitat by increasing turbidity and total suspended solids. Accumulation of fine sediment in aquatic substrate can adversely affect fish spawning success and limit habitat suitability for many aquatic invertebrates.

Condition 16 requires Merced ID to develop and implement a Recreation Facilities Management Plan in consultation with BLM, CDFW, USFWS, and State Water Board staff. The Recreation Facilities Management Plan will include: (1) measures that will be implemented to protect water quality; (2) monitoring; and (3) schedules to implement the proposed improvements and new recreation facilities.

6.17 Rationale for Condition 17 – Road Management

Operations and maintenance of the Merced Projects' roads have the potential to impact water quality. The potential for water quality impacts depends on factors such as local topography, roadbed material, and drainage characteristics. To avoid and minimize these potential water quality impacts, Condition 17 requires Merced ID to develop and implement a Road Management Plan. Condition 17 will help ensure operation and maintenance of the Merced Projects roads do not cause discharges to surface waters that violate water quality standards.

6.18 Rationale for Condition 18 – Biological Monitoring and Management

Continued operation of the Merced Projects has the potential to impact fish populations, special-status amphibians, and benthic macroinvertebrate (BMI) assemblages in the Merced Projects-affected stream reaches. Biological measurements are the most direct indicator of the health and the well-being of fish and wildlife populations. Biological monitoring can detect changes, identify additional information needs, and guide adaptive management of the Merced Projects operations. Biological metrics can be used to assess the long-term impact from physical and chemical degradations (e.g., bioassessments). Corresponding biological data and environmental information (e.g., temperature, acres of floodplain inundation, flow pulse timing) can be used to evaluate the impact of management actions on fish and wildlife health. Of particular importance are the annual installation and operation of rotary screw traps for juvenile fish monitoring and an adult fish counting facility to collect necessary data on salmon and steelhead to evaluate population dynamics and inform the operation of the Merced Projects. The Bay-Delta Plan Program of Implementation indicates that biological goals (e.g., abundance, spatial extent, survival, and temporal presence) will be used as part of adaptive management and to measure the effectiveness of the program. The State Water Board approved the [*Final Initial Biological Goals for the lower San Joaquin River*](#)²⁰ on February 6, 2024 in adopting [State Water Board Resolution No. 2024-0006](#).

Condition 18 requires Merced ID to develop and implement a Biological Monitoring and Management Plan in consultation with the Merced River Anadromous Fish Committee, Merced River Watershed Group, and the Lower San Joaquin River Watershed Group. The Biological Monitoring and Management Plan will identify monitoring and adaptive management that will be implemented for anadromous fish, BMI, and amphibians in the Lower Merced River.

6.19 Rationale for Condition 19 – Comprehensive Monitoring, Assessment, Reporting, and Special Studies

A comprehensive monitoring, assessment, reporting, and special studies program is necessary to determine compliance with water quality standards and flow and water quality requirements contained in this certification. Monitoring and special studies are also needed to: assess the effectiveness of flow and water quality requirements in this certification; inform adaptive implementation and adaptive management decisions such as annual operations plans and the timing of pulse flows; investigate the technical factors involved in water quality control; and inform future amendments to water quality control plans.

The Bay-Delta Plan Program of Implementation for the LSJR flow objectives requires formation of the San Joaquin River Monitoring and Evaluation Program (SJRMEP),

²⁰ State Water Board. 2023. Final Initial Biological Goals for the Lower San Joaquin River. September. Available online at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/2024/20240206-final-initial-biological-goals-reso.pdf. (Accessed: January 23, 2025)

which includes comprehensive monitoring, evaluation, special studies, and reporting associated with implementation of the Bay-Delta Plan flow and water quality objectives. Development and implementation of the Merced River Monitoring Plan may be used as the Merced River portion of the SJRMEP.

The monitoring and assessment required in Condition 19 is consistent with multiple other statewide efforts to improve the quality of and access to monitoring data for the regular assessment of the status of natural resources. The California Water Quality Monitoring Council (Monitoring Council) develops specific recommendations to improve the coordination and cost-effectiveness of water quality and ecosystem monitoring and assessment, enhance the integration of monitoring data across departments and agencies, and increase public accessibility to monitoring data and assessment information. The 2016 Open and Transparent Water Data Act calls for DWR, in consultation with the Monitoring Council, State Water Board, and CDFW, to create, operate, and maintain a statewide integrated water data platform, develop protocols for data sharing, documentation, quality control, public access, and promotion of open-source platforms and decision support tools related to water data (e.g., groundwater, water quality, fisheries, water project operations).

Comprehensive monitoring is needed to address individual and cumulative impacts of the Merced Projects to fish and wildlife beneficial uses. Development and implementation of the comprehensive monitoring, assessment, reporting, and special studies program should be a collaborative effort with the State Water Board and watershed partners, including Merced ID. The Merced River is one tributary in the Bay-Delta Watershed that supports native resident and migratory fish that migrate through the Sacramento-San Joaquin Delta. Accordingly, the Merced River Monitoring Plan should be integrated and coordinated with new and ongoing monitoring programs in the LSJR watershed and Bay-Delta such as CDFW fish monitoring efforts, Interagency Ecological Program, FERC licensing proceedings, San Joaquin River Restoration Program, and regional water quality monitoring programs. This level of integration is necessary to coordinate flow actions among the salmon-bearing LSJR tributaries, evaluate progress toward achieving biological goals and protection of fish and wildlife beneficial uses, evaluate and prioritize aquatic habitat stressors, and assess the effectiveness of LSJR flow objectives on a regional scale.

The Bay-Delta Plan requires annual and comprehensive reporting of monitoring data. Annual reporting is required to inform the next year's operations and other activities to protect fish and wildlife. In addition to annual reporting, every three to five years a comprehensive report is required to review the progress toward meeting biological goals and identify any recommended changes to the implementation of the LSJR flow objectives. The State Water Board will hold public meetings to receive, discuss, and consider the comprehensive report, technical information, and conclusions or recommendations developed through a peer review process. This information will be used to inform potential adaptive changes to the implementation of the LSJR flow objectives and, as appropriate, future potential changes to the Bay-Delta Plan.

6.20 Rationale for Condition 20 – Construction and Maintenance

Protection of the beneficial uses identified in the SR/SJR Basin Plan requires effluent limitations and other limitations on pollutant discharges from point and nonpoint sources to the Merced River and its tributaries. The Merced Projects may replace or rehabilitate existing facilities and conduct other activities that may require construction or maintenance through the term of the FERC license. Erosion from the Merced Projects-related construction and maintenance activities has the potential to result in discharges that violate water quality standards. Condition 20 requires Merced ID to comply with the terms of the Construction General Permit and to develop and implement appropriate Water Quality Monitoring and Protection Plans when needed.

6.21 Rationale for Condition 21 – Reintroduction of Anadromous Fish

The Merced River historically supported populations of Central Valley Chinook salmon (both fall-run and spring-run), steelhead, Pacific lamprey, and green sturgeon as well as numerous other native fish species. Spring-run Chinook salmon are currently listed as threatened under the Endangered Species Act. Prior to dam construction, anadromous fishes, including the Chinook salmon, migrated upstream to suitable spawning habitat. The Merced Projects' facilities and other structures limit the upstream extent of habitat that anadromous fish can access.

Water quality conditions (e.g., temperature and contaminant concentrations) are typically better in the river at upstream locations compared to downstream locations. Figure 19-7 of the State Water Board's 2018 SED shows that Lake McClure inflow temperatures reach suitable salmon spawning levels (55.4°F) approximately one month earlier than Crocker-Huffman diversion dam release temperatures, illustrating how conditions downstream of the Merced Projects' reservoirs are of lower quality, especially for spawning salmon cold water habitat.

Crocker-Huffman diversion dam (River Mile 52.0) represents the current upstream barrier to native resident and migratory fish in the Lower Merced River. Prior to being shut down in the 1970s, Crocker-Huffman diversion dam had an existing fish ladder. As outlined in the Final EIS, NMFS recommends that Merced ID provide fish passage to cold-water habitat upstream of Crocker-Huffman diversion dam until a long-term water temperature improvement plan is developed. Fish passage above barriers can allow access to a larger abundance of improved habitat for native resident and migratory fish species.

Condition 21 require studies and a plan for reintroduction of anadromous fish if such reintroduction is reasonably foreseeable, if directed by the Deputy Director.

6.22 Rationale for Conditions 22 through 45

This certification imposes additional conditions regarding the Merced Projects approvals, monitoring, enforcement, and potential future revisions.

Condition 22 is necessary to comply with Water Code section 13167 and Conditions 23 through 26 contain important clarifications concerning the scope and legal effect of this certification, and other legal requirements that may apply to the Merced Projects.

Monitoring, reporting, and assessment actions, and the information developed through such actions, must be readable, shared, and coordinated with other appropriate entities, and accessible to ensure that a discharge activity complies with water quality requirements. Water Code section 13167 requires the Water Boards to ensure that monitoring data and assessment information are available in a single location and that the information is presented in a manner easily understandable by the public. To fulfill this legislative mandate, Condition 22 requires electronic data submittal in a format compatible with existing system specifications. Compliance with this condition enhances the accessibility of data and transparency of regulatory actions. This allows regulatory agencies and the public to better assess compliance and understand water quality trends or data anomalies by compiling data and making it readily available.

Pursuant to the California Endangered Species Act (Fish & G. Code, § 2050 et seq.) and federal Endangered Species Act (16 U.S.C. § 1531 et seq.), Condition 23 of the certification does not authorize any act which results in the taking of a threatened, endangered, or candidate species.

An applicant for certification is required to identify other licenses, permits, and agreements in the application. In the event an applicant for certification needs authorization from the state or federal authorities, California Code of Regulations, title 23, section 3856, subdivision (e), requires that the applicant provide copies of “any final and signed federal, state, and local licenses, permits, and agreements (or copies of the draft documents, if not finalized) that will be required for any actions associated with the activity. If no final or draft document is available, a list of all remaining agency regulatory approvals being sought shall be included.” To help ensure the integrity of the certification process and its focus on ensuring that Project activities meet water quality standards and other appropriate requirements of state law, Condition 24 serves to notify applicants that there may be additional applicable federal, state, or local laws or ordinances with which they must comply, including the state and federal Endangered Species Acts (Condition 23).

Water Code section 13160, subdivision (b)(1) allows the State Water Board to issue a certification when there is “reasonable assurance that an activity of any person subject to the jurisdiction of the [State Water Board] will comply with applicable requirements” of state and federal law. Because agency organization and authorities change over time, Condition 25 provides direction for continuity of oversight in the event an agency’s authority or responsibility is transferred to or subsumed by another agency.

The State Water Board is responsible for the water right, water quality, and drinking water functions of the California state government. (Wat. Code, § 174.) Certain certifications involve an appropriation of water subject to part 2 of division 2 of the Water Code or the diversion of water for certain beneficial uses. (See, e.g., Cal. Code Regs., tit. 23, § 3855, subd. (b)(1)(A).) Condition 26 explains the State Water Board’s issuance

of this certification is not adjudicating or approving the validity of water rights that may be related to the Project. It also recognizes the State Water Board's authority, independent of its water quality authority, to prevent unauthorized or threatened unauthorized diversions of water. This helps to ensure that an applicant for a federal license or permit that involves a discharge to navigable waters understands that, except as specified in the certification, the certification does not constitute, or excuse the applicant from obtaining any other State Water Board approvals required for the activity.

Conditions 27 through 29 are necessary to assure that any discharge authorized under the certification will comply with water quality requirements. These conditions are included to comply with California Code of Regulations, title 23, section 3860, which sets forth conditions that must be included in all certifications.

Condition 27 is a standard condition that "shall be included as conditions of all certification actions" pursuant to California Code of Regulations, title 23, section 3860, subdivision (a). This condition places the permittee on notice that the certification action may be modified or revoked following administrative or judicial review. Condition 28 is a standard condition that "shall be included as conditions of all water quality certification actions" pursuant to California Code of Regulations, title 23, section 3860, subdivision (b). This condition clarifies the scope of the certification's application and ensures that any applicant for a federal license or permit, which may result in a discharge into navigable waters, is subject to the appropriate State certification. Condition 29 is a standard condition that "shall be included as conditions of all water quality certification actions" pursuant to California Code of Regulations, title 23, section 3860, subdivision (c). This fee requirement condition is also required pursuant to California Code of Regulations, title 23, section 3833, subdivision (b), which requires payment of fees by project proponents applying for certification. Fees are essential to support the Water Boards' certification program, which includes the development of certifications and related inspections to ensure the protection of water quality and beneficial uses that may be impacted by a project.

Conditions 30 through 45 are necessary to ensure that the Merced Projects operate to meet water quality standards and other appropriate requirements of state law, or that adjustments are made to ensure continued compliance with water quality standards in light of new information, changes to the Merced Projects, climate change, or changes to the standards themselves.

This certification requires monitoring, reporting, and analysis as important elements to ensure that the Merced Projects activities will comply with state and federal water quality requirements and other appropriate requirements of state law. Conditions 30, 31, and 32 provide for extensions of time to comply with requirements, prevention or remedy of violations, and notification of additional actions to ensure compliance and prevent violations of water quality standards. In the event of non-compliance, additional actions may be necessary to return the Merced Projects to compliance and prevent violation of water quality standards. Conditions 33, 34, 35, and 37 require Licensee to comply with the SR/SJR Basin Plan and Bay-Delta Plan, and amendments thereto; provide for updates to the Merced Projects based on changes in technology and

methodology; provide for consideration of the effects of climate change on Merced Projects operations and updates to ensure continued compliance with appropriate requirements of state law; and ensure that all reasonable measures are taken to protect water quality and beneficial uses, in accordance with plans adopted pursuant to state and federal water laws.

Water Code section 13267 authorizes the State Water Board to require any person or entity who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste to furnish, under penalty of perjury, technical or monitoring reports when necessary to investigate the quality of any waters of the State. Condition 36 requires such reports that are necessary to ensure compliance with water quality standards.

Condition 38 provides that the State Water Board will provide notice and an opportunity to be heard in exercising its authority to add or modify certification conditions.

Condition 39 relates to site access requirements and is authorized pursuant to the Water Boards' authority to investigate the quality of any waters of the State, including specific site access authorized under Water Code section 13267 and 13383. Site access is needed to ensure compliance with the certification and associated protection of water quality and beneficial uses.

Condition 40 requires site personnel and agencies to be familiar with the content of the certification and availability of the document at the Merced Projects sites. This condition is required to ensure that site personnel are familiar with the conditions needed to protect water quality and any authorized discharge will comply with the terms and conditions of this certification, which requires compliance with water quality objectives and beneficial uses adopted or approved under sections 13170 or 13245 of the Water Code, and with other appropriate requirements of state law.

Condition 41 requires the Licensee to use analytical methods approved by California's Environmental Laboratory Accreditation Program, when available, to ensure that such analyses are done in a consistent manner.

Conditions 42 and 43 ensure the Licensee complies with the Dredge or Fill Procedures and the Merced Projects operation and maintenance activities result in no net loss of wetland quantity, quality, or permanence, consistent with the Water Code sections 16200-16201.

Condition 44 ensures the certification can be modified to avoid or reduce significant environmental impacts based on any findings from environmental documents obtained through CEQA.

In the event that any provision of this certification is found invalid, Condition 45 ensures that the certification will remain effective, and water quality will still be protected. (Wat. Code, § 13160.)

7.0 Conclusion

The State Water Board finds that, with the conditions and limitations imposed under this certification, the Merced Projects will comply with applicable state water quality standards and other appropriate requirements of state law.

8.0 Water Quality Certification Conditions

ACCORDINGLY, BASED ON ITS INDEPENDENT REVIEW OF THE RECORD, THE STATE WATER RESOURCES CONTROL BOARD CERTIFIES THAT OPERATION OF THE MERCED RIVER HYDROELECTRIC PROJECT AND MERCED FALLS HYDROELECTRIC PROJECT (collectively Merced Projects) will comply with sections 301, 302, 303, 306, and 307 of the Clean Water Act, and with applicable provisions of State law under the following terms and conditions.

CONDITION 1. Instream Flows

1.A Water Year Types

Unless otherwise required by the Deputy Director as described later in this condition, minimum flow requirements will be determined using a water year classification system for the Merced River, referred to as the Merced 60-20-20 Index, which was established by the Merced Irrigation District (Merced ID or Licensee). The Merced 60-20-20 Index has five-water year classifications as follows: Wet (W), Above Normal (AN), Below Normal (BN), Dry (D), and Critically Dry (C). The Merced 60-20-20 Index is calculated, in units of thousand acre-feet (TAF), as: 60 percent of the current year's April through July unregulated runoff (inflow) below Merced Falls (i.e., unimpaired inflow to Lake McClure), plus 20 percent of the current year's October through March unregulated runoff below Merced Falls, plus 20 percent of the lesser of: (1) the previous year's index; or (2) 675 TAF. The Merced 60-20-20 Index is used to determine the resulting water year based on the following numerical breakpoints:

- Wet: Index \geq 650 TAF
- Above Normal: Index $>$ 530 TAF and $<$ 650 TAF
- Below Normal: Index $>$ 420 TAF and \leq 530 TAF
- Dry: Index $>$ 360 TAF and \leq 420 TAF
- Critically Dry: Index \leq 360 TAF

Unless otherwise approved by the State Water Resource Control Board (State Water Board) Deputy Director of the Division of Water Rights (Deputy Director),²¹ Merced ID shall determine the water year classifications using the Merced 60-20-20 Index. Water year classifications shall be determined each month from January through April and will apply from the 15th day of the month through the 14th day of the next month (January 15 to February 14 and February 15 to March 14, etc.), as follows:

²¹ Per provisions in Condition 1.A, the Deputy Director may require changes to the Merced 60-20-20 Index Methodology or broader water year type methodology during the term(s) of the new FERC license(s) for the Merced Projects. Any such changes approved by the Deputy Director shall supersede the provisions of Condition 1.A in the event of a conflict.

- For the January preliminary Index calculation, the 75 percent exceedance forecast from the California Department of Water Resources' (DWR) corresponding Water Supply Index²² (WSI) shall be used for the current water year's October through March unregulated runoff and observed or expected values shall be used for the current water year's April through July unregulated runoff.
- For the February preliminary Index calculations, the 75 percent exceedance forecast, from the corresponding monthly issue of the DWR Bulletin 120,²³ shall be used for the current water year's October through March unregulated runoff and observed or expected values shall be used for the current water year's April through July unregulated runoff.
- For the March and April preliminary Index calculations, the 75 percent exceedance forecast, from the corresponding monthly issue of the DWR Bulletin 120, shall be used for the current water year's April through July unregulated runoff and observed or expected values shall be used for the current water year's October through March unregulated runoff.

The final water year classification shall be determined in May and shall apply from May 15 through January 14 of the following water year. For the May Index calculation, a 50 percent exceedance forecast, from the May issue of DWR's Bulletin 120, shall be used for the current water year's April through July unregulated runoff and observed values shall be used for the current water year's October through March unregulated runoff.

Within 15 days of each water year type determination, the Licensee shall provide written notice and support for the determination.

Approval and Documentation of Merced 60-20-20 Index Methodology. Within 90 days of issuance of the new Federal Energy Regulatory Commission (FERC) license(s) for the Merced Projects, the Licensee shall submit background and supporting information related to the Merced 60-20-20 Index Methodology and how it will be implemented to the Deputy Director for review and consideration of approval. The Deputy Director may require changes as part of any approval. At a minimum, the Licensee shall provide the following information related to implementing the Merced 60-20-20 Index to determine water year types:

²² WSI is a publication issued by DWR in the months of December, January, February, March, April, and May. It contains forecasts based on precipitation and runoff observed through December 31 of the previous year.

²³ Bulletin 120 is a publication issued by DWR four times a year, in the second week of February, March, April, and May. It contains forecasts of the volume of seasonal runoff from California's major watersheds, and summaries of precipitation, snowpack, reservoir storage, and runoff in various regions of California.

- Measurement devices, technologies, data, equations, and other information sources used to measure and calculate flows, reservoir outflow, reservoir storage volume, and diversions as part of the determination of water year type and the Merced 60-20-20 Index;
- Data, information sources, and calculations used to estimate unimpaired flow and unregulated inflow to Lake McClure;
- Methodology used to determine water year type classifications; and
- Any additional documentation supporting how the Licensee determines the water year type using the Merced 60-20-20 Index.

The Licensee shall file the Deputy Director-approved Merced 60-20-20 Index Methodology with FERC.

Evaluation and Potential Updates to Water Year Type Methodology. No sooner than five years following issuance of the new FERC license(s) for the Merced Projects and throughout the term(s) of the new FERC license(s) and any extensions, the Deputy Director may require that the Licensee develop a report evaluating the effectiveness of the Merced 60-20-20 Index to match the timing and volume of actual water supply conditions (unimpaired flow) in the Merced River watershed and make recommendations regarding potential updates to the methodology used to establish water year types for the Merced Projects that more accurately align with the volume and timing of actual water supply conditions. The Deputy Director may request such a report based on information suggesting the Merced 60-20-20 Index methodology produces water supply estimates that are no longer reflecting the timing and volume of actual water supplies as estimated by unimpaired flow (e.g., changes in snowmelt, precipitation, or other factors that impact the assumptions of the methodology). The report and recommendations shall be developed in consultation with State Water Board staff. The Licensee shall submit the report and recommendations to the Deputy Director for review and consideration of approval by the deadline identified by the Deputy Director. The Deputy Director may require changes as part of any approval.

The Licensee shall file with FERC any Deputy Director approved updates to the water year type methodology. The Licensee shall implement changes to the water year type methodology upon receipt of Deputy Director and any other required approvals.

1.B Minimum Instream Flows Below New Exchequer Dam, at Shaffer Bridge, and at Stevinson Gage

The Licensee is required to operate the Merced Projects to meet the minimum instream flows below New Exchequer Dam, at Shaffer Bridge, and at the Stevinson gage as noted below and later in Condition 1. If a specified compliance gage(s) or location(s) is no longer available during the term(s) of the FERC license(s), an alternate gage or location at or downstream of the specified compliance location may be used if approved by the Deputy Director.

Below New Exchequer Dam. The Licensee shall provide a minimum flow of 25 cubic feet per second (cfs), measured as reservoir outflow at the New Exchequer Dam station (California Data Exchange Center station ID EXC), at all times, to ensure the riverine section between New Exchequer Dam and McSwain Reservoir is not dewatered.

Shaffer Bridge. No later than three months following license(s) issuance, the Licensee shall maintain minimum instream flows specified in Table 1 at Shaffer Bridge (River Mile 32.5), as measured at United States Geological Survey (USGS) gage no. 11271290 (also known as Merced River at Shaffer Bridge near Cressey California). The minimum flow requirements in Table 1 are defined based on the water year types described in Condition 1.A above.

**Table 1. Minimum Instream Flow Requirements at Shaffer Bridge
(in cubic feet per second)**

Time Period	Wet	Above Normal	Below Normal	Dry	Critically Dry
January	220	220	220	180	180
February	220	220	220	180	180
March 1 - 15	220	220	220	180	180
March 16 - 31	410	370	330	275	200
April 1 - 15	590	500	450	375	250
April 16 - 30	790	700	600	500	300
May	790	700	600	400	250
June	200	150	150	100	100
July	200	150	150	150	150
August	200	150	150	150	150
September	200	150	150	150	150
October 1 - 15	200	150	150	150	150
October 16 - 31	175	175	150	150	150
November	220	220	220	180	180
December	220	220	220	180	180

Stevinson Gage (closest available compliance point to confluence with San Joaquin River): No later than three months following license(s) issuance, Licensee shall maintain minimum instream flows, as measured at DWR’s Merced River near Stevenson gage (MST, River Mile 4.5) site ID 0981, of 66 cfs from July 1 through September 30 and 150 cfs from November 1 through January 30. If Licensee is aware of any water diverter with a junior priority, or that is otherwise not entitled to divert at a given time, diverting or threatening to divert significant quantities of water at a time when Licensee is required to bypass or release water to meet these minimum instream flows, Licensee shall report that diversion or threatened diversion to the State Water Board, which will consider appropriate action.

1.C Pulse Flows

No later than three months following license(s) issuance, Licensee shall release pulse flows as specified in this condition, as measured at Shaffer Bridge (River Mile 32.5).

- Fall: Licensee shall provide a fall pulse flow measured at Shaffer Bridge (River Mile 32.5), during October and/or November until a total volume of 12,500 acre-feet (AF) is released. This volume is in addition to the volume of flows set forth in Table 1 for the same period. The timing, magnitude, and duration, of the fall pulse flow shall be determined in consultation with the Merced River Anadromous Fish Committee and the Lower San Joaquin River Watershed Group (Condition 6).
- Spring: Licensee shall provide a minimum spring pulse flow volume between February and May, as measured at Shaffer Bridge (River Mile 32.5), of 30,000 AF during Wet water years, 20,000 AF during Above Normal water years, 15,000 AF during Below Normal water years, 10,000 AF during Dry water years, and 5,000 AF during Critically Dry water years. This volume is in addition to the volume of flows set forth in Table 1 for the same period. The spring pulse flow volume shall be based on the water year type (Condition 1.A) in effect at the time the pulse flow is initiated, and may need to be adjusted if a change in water year type requires a larger pulse flow volume. If the May Bulletin 120 results in a change in water year type that requires a larger pulse flow volume, the Licensee shall consult with the Merced River Anadromous Fish Committee to determine how to best provide the additional volume of water. The timing, magnitude, and duration of the base and peak spring pulse flow releases shall be determined in consultation with the Merced River Anadromous Fish Committee and the Lower San Joaquin River Watershed Group (Condition 6).

1.D Bay-Delta Plan Flow Objectives

No later than three months following license issuance, the Licensee shall operate the Merced Projects in a manner consistent with the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) (State Water Board, 2018b) and any amendments thereto. This includes achieving the LSJR narrative and numeric water quality objectives established in the Bay-Delta Plan, Table 3, Water Quality Objectives for Fish and Wildlife Beneficial Uses, consistent with measures in the Bay-Delta Plan's program of implementation, including provisions for adaptive implementation. Adaptive implementation of the LSJR flow objectives may result in flows that achieve base flows and pulse flows set forth in Conditions 1.B and 1.C subject to the criteria and approval process set forth in this certification and the Bay-Delta Plan's program of implementation. Adaptive implementation is encouraged as a feature of the program of implementation because it allows for adjustment of the required percentage of unimpaired flow in specified ways to improve the functions of those flows and better achieve the water quality objectives in response to changing information and conditions. In addition, subject to acceptance by the State Water Board, the Bay-Delta Plan expressly allows the use of a voluntary agreement as a means of implementing the LSJR flow objectives.

The Licensee shall ensure that flows from the Merced River, including flows bypassed, released, or otherwise provided by the Licensee and any other available flows, meet the LSJR flow objectives for the Merced River and contribute to the flow objective at Vernalis.

This condition is not intended to relieve any other water diverter of applicable requirements, or to preclude the State Water Board from setting additional requirements for other diverters to contribute to the achievement of the LSJR flow objectives. If the Licensee is aware of any water diverter with a junior priority, or otherwise not authorized to divert at a given time, diverting or threatening to divert significant quantities of water at a time when the Licensee is required to bypass or release water to meet the LSJR flow objectives, the Licensee shall report that diversion or threatened diversion to the State Water Board, which will consider appropriate action.

Flow requirements from Condition 1.B, 1.C, and 1.D are consolidated into Appendix B – Consolidated Instream Flow Requirements, for convenience and illustrative purposes.

1.E Compliance Methods

No later than six months after license issuance, the Licensee shall submit compliance methods for the flow requirements in Conditions 1.B, 1.C, and 1.D to the Deputy Director for review and consideration of approval. Compliance methods for Conditions 1.C. and 1.D shall be developed in consultation with the Merced River Watershed Group and the Lower San Joaquin River Watershed Group (Condition 6). The Deputy Director may require changes as part of any approval.

Flows shall be measured in two ways: (1) as an instantaneous flow; and (2) as the 24-hour average of the flow (mean daily flow). The instantaneous flow is the value used to construct the mean daily flow value and shall be measured in 15-minute or more frequent increments. Each instantaneous flow measurement shall be equal to or greater than 90 percent of the designated minimum flow value. The mean daily flow is the average of the incremental readings of instantaneous flow from midnight (12:00 AM) of one day to midnight (12:00 AM) of the next day. The Licensee shall record instantaneous (usually every 15-minutes) flow readings at all gages, consistent with USGS standards, and ensure the gages are calibrated for the full range of flows that are required, including pulse and unimpaired flows. The Licensee shall report any deviation from the required flows to the State Water Board's Deputy Director within 24 hours of the deviation.

Flows shall be measured at the gage locations referenced in this condition unless otherwise approved by the Deputy Director. The Licensee shall comply with applicable California laws and regulations regarding measuring and monitoring water diversions, including California Code of Regulations, title 23, section 933, and amendments thereto, and State Water Board requirements to provide telemetered diversion data on a public

website.²⁴ The Licensee shall post all flow and other data to the California Data Exchange Center website, within 24-hours of flow measurement, unless otherwise approved by the Deputy Director. The Licensee shall provide notice to the Deputy Director and publicly notice at an easily accessible location on the internet all known events that will affect minimum flow releases (e.g., powerhouse outages, construction, etc.) in the Merced Projects' reaches a minimum of 30 days in advance.

1.E.1 Minimum Instream Flows

The point of measurement for compliance with minimum instream flows identified in Condition 1.B are as follows unless another location and/or gage at or downstream of the location specified below is approved by the Deputy Director. Minimum instream flows are in cfs as a mean daily average:

- Flows released at New Exchequer Dam shall be measured and monitored at all times at the New Exchequer Dam station (California Data Exchange Center station ID EXC).
- Flows identified in Table 1 shall be measured and monitored at Shaffer Bridge (River Mile 32.5).
- Flows to support Merced River flows to its confluence with the San Joaquin River (i.e., 66 cfs in July through September and 150 cfs from October through January) shall be measured and monitored at the Stevinson gage (DWR's MST gage, DWR Site ID 0981).

1.E.2 Pulse Flows

Fall Pulse Flow: Flows shall be measured and monitored at Shaffer Bridge (River Mile 32.5). The exact timing of the beginning of the pulse flow release shall be determined by the Merced River Anadromous Fish Committee and coordinated with the Lower San Joaquin River Watershed Group (Condition 6). The fall block pulse flow volume shall reach 12,500 AF while ensuring that spawning occurs in the baseflow channel rather than in overbank areas. The volume of water attributed to minimum flows required by Condition 1.B shall not be included in the pulse flow volume.

Spring Pulse Flow: Flows shall be measured and monitored at Shaffer Bridge (River Mile 32.5). The configuration of all releases (i.e., flows to be released on each day) and the exact timing of the beginning of the release shall be determined by the Merced River Anadromous Fish Committee and coordinated with the Lower San Joaquin River Watershed Group (Condition 6). Compliance with this provision shall be based on verification of the number of days flows exceed 1,000 cfs (e.g., no less than nine days in

²⁴ Information regarding telemetered requirements are available online at the State Water Board's [Telemetry Requirements webpage](https://www.waterboards.ca.gov/waterrights/water_issues/programs/measurement_regulation/telemetry_requirements.html), which is available online at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/measurement_regulation/telemetry_requirements.html. (Last Accessed November 14, 2024)

Wet years) and the total volume of the pulse flow release (e.g., no less than 30,000 acre-feet in Wet years). The releases shall be configured to consist of flows equal to or greater than 1,000 cfs for up to a total of nine days in Wet water years, seven days in Above Normal water years, and six days in Below Normal water years. Additionally, the peak flow shall be held for two days, followed by a gradually descending hydrograph. The time needed to reach the 1,000 cfs threshold at the beginning of the pulse flow and to ramp down from 1,000 cfs to the required minimum flow shall not be included in the designated days over 1,000 cfs. The total volume attributed to the pulse flow includes flows from the onset of the ramp up to the pulse flow to the return to the designated minimum flow. The volume of water attributed to minimum flows required by Condition 1.B shall not be included in the pulse flow volume.

1.E.3 LSJR Flow Objectives

The Licensee shall develop compliance methods for the LSJR flow objective specific to the Merced River that are consistent with the Bay-Delta Plan and submit the methods to the State Water Board's Executive Director (Executive Director) for consideration of approval. On September 20, 2019, the State Water Board released a draft guidance document, *Initial Unimpaired Flow Compliance Measures*, that provides basic steps for monitoring and assessing compliance with the LSJR unimpaired flow objectives and identifies several issues that need to be resolved. State Water Board staff has been developing methods to address these issues and anticipates submitting updated Unimpaired Flow Compliance Methods that include options for voluntary agreements, to the Executive Director for consideration. Compliance methods approved by the State Water Board or Executive Director in accordance with the Bay-Delta Plan shall be used to inform the Licensee's development of compliance methods specific to the Merced River as required by this condition.

1.E.4 Unplanned and Planned Temporary Flow Modifications

Unplanned Temporary Flow Modifications. The flows specified in Condition 1 may be temporarily modified if required by equipment malfunction reasonably beyond the control of the Licensee, as directed by law enforcement authorities, or in emergencies. An emergency is defined as an unforeseen event that is reasonably out of the control of the Licensee and requires the Licensee to take immediate action, either unilaterally or under instruction by law enforcement or other regulatory agency staff, to prevent imminent loss of human life or substantial property damage. An emergency may include, but is not limited to, natural events such as: landslides, storms, or wildfires; malfunction or failure of Project works; and recreation accidents. Drought is not considered an emergency for purposes of this condition.

When possible, the Licensee shall notify the Deputy Director prior to any unplanned temporary instream flow modification. In all instances, the Licensee shall notify the Deputy Director within 24 hours of the beginning of any unplanned temporary streamflow modification. Within 96 hours of the beginning of any unplanned temporary stream flow modification, the Licensee shall provide the Deputy Director with an update

of the conditions associated with the modification and an estimated timeline for returning to the required instream flows.

Within 30 days of the beginning any unplanned temporary instream flow modification, the Licensee shall provide the Deputy Director with: (1) a written description of the modification and reason(s) for its necessity; (2) photo documentation of the emergency or reason for the instream flow modification; (3) a timeline for returning to the required instream flow or timeline when the instream flow resumed; (4) a description of corrective actions taken in response to any unplanned under-release of flow; and (5) a plan to prevent the need for modification of instream flows resulting from a similar emergency or event.

Planned Temporary Flow Modifications. The flow requirements in Conditions 1.B and 1.C may be temporarily modified for planned maintenance or an activity associated with the Merced Projects following Deputy Director approval. Condition 1.D flows can be adaptively managed such that any temporary modification to the unimpaired flow shall be coordination with the Merced River Watershed Group (Condition 6) such that compliance with the LSJR flow requirements in the Bay-Delta Plan are met. Merced ID shall request approval for any temporary flow modification to Conditions 1.B and 1.C requirements from the Deputy Director no later than 60 days prior to any such planned maintenance or activity. The notification shall include: (1) a description of the need for a temporary flow modification; (2) the requested temporary flow modification, including its anticipated duration; (3) any measures that will be implemented to ensure protection of water quality and beneficial uses during the temporary flow modification; and (4) documentation of consultation with the applicable fish and wildlife agencies if appropriate. The Deputy Director may require Merced ID to defer the temporary minimum instream flow modification or implement other actions as part of any temporary minimum instream flow modification approval. The Licensee shall file with FERC the Deputy Director approval and any amendments thereto. Temporary minimum instream flow modifications shall be implemented upon Deputy Director approval and any other required approvals.

1.F Annual Operations Plan

The Licensee shall prepare an Annual Operations Plan that describes actions, operations, and methods for meeting instream flows identified in Condition 1, reservoir storage requirements in Condition 3, temperature and dissolved oxygen targets identified in Condition 8, and water deliveries to the Merced National Wildlife Refuge identified in Condition 15. The Annual Operations Plan shall cover the current water year. The Annual Operations Plan shall identify how instream flow requirements, carryover storage requirements, dissolved oxygen objectives, and temperature targets will be achieved under a reasonable range of hydrological conditions (i.e., hydrological conditions that are reasonably expected in the year for which the plan is prepared). The Annual Operations Plan shall identify appropriate strategies for meeting flow, dissolved oxygen, temperature, and carryover storage requirements and identify relevant parameters such as precipitation volume, monthly reservoir storage, as well as precipitation, inflow, storage patterns, and resulting streamflow. The annual operations

plan shall identify how Bay-Delta Plan flows and other flow requirements are calculated or measured, identify compliance methods for minimum, pulse, and Bay-Delta Plan flows, and how adjustments will be made as updated information regarding the present year's hydrology becomes available, such as DWR's monthly Bulletin 120 publications during late winter and spring. Equations and gage locations shall be provided as part of the description of flow calculations to meet requirements. The Annual Operations Plan shall include any planned and reasonably foreseeable operations or maintenance that may necessitate the Licensee requesting temporary modification to any flows or other requirements in this certification.

The Bay-Delta Plan requires annual adaptive operations plans to identify adaptive implementation actions for achieving the LSJR flow objectives. The annual operations plan required under this condition may be used to fulfill the Bay-Delta Plan's requirements for annual adaptive operations plans provided that the requirements in the Bay-Delta Plan are met.

By November 1 of each year, the Licensee shall submit a draft Annual Operations Plan to the Deputy Director, the Merced River Watershed Group, and the Lower San Joaquin River Watershed Group (Condition 6), for review and recommendations. The draft annual operations plan shall cover the current water year (October 1 – September 30 of the following year). After considering recommendations, the Licensee shall submit a proposed Annual Operations Plan to the Executive Director by January 10 of the current water year for consideration of approval. When acting on requests for approval of annual operations plans, the State Water Board or Executive Director will consider the recommendations of the Merced River Watershed Group and Lower San Joaquin River Watershed Group (if functionally equivalent to the Stanislaus, Tuolumne, and Merced Working Group), along with the requirements and procedures for adaptive implementation and other relevant information. As part of any approval, the Executive Director may require changes to the proposed Annual Operations Plan, based on advice from the watershed groups or other relevant information.

If hydrologic conditions change in the current water year such that revisions need to be made to an approved annual operations plan, the Licensee shall submit a Revised Operations Plan to the Executive Director for consideration of approval after consultation with the Merced River Watershed Group and the Lower San Joaquin River Watershed Group (if functionally equivalent to the STM Working Group). The State Water Board recognizes that an adaptive Annual Operations Plan is based on a forecast from the best available information and may not accurately reflect actual conditions that occur during the February through June period. Accordingly, the State Water Board will consider this factor and whether the hydrologic condition could have been planned for in evaluating deviations from approved adaptive operations plans. The Executive Director may require changes to any Revised Operations Plan as part of any approval.

The annual operations plans and any revisions thereto shall be implemented upon approval of the Executive Director and any other required approvals. The Licensee shall file with FERC the Executive Director-approved annual operations plan, and any approved revisions thereto.

1.G Dry Year Management Operations Plan

No later than one year following license issuance, the Licensee shall submit a Dry Year Management Operations Plan to the Deputy Director for consideration of approval. The Deputy Director may require changes as part of any approval. The Dry Year Management Operations Plan shall outline operations strategies for optimizing water supply reliability for instream flows and water deliveries during Dry years in anticipation of multiple, sequential dry years. Dry-year water management strategies identified in the approved plan shall be designed to minimize the frequency of requesting modification of the flow requirements of this certification as described in Condition 4 (Extremely Dry Conditions).

The Dry Year Management Plan shall be developed in consultation with the Merced River Watershed Group (Condition 6), and include, at minimum, a description of the process for allocating water to users during years with and without water shortages, a description of options for reservoir storage targets that address water deliveries and the need for instream flows and downstream temperature management in anticipation of multiple, sequential dry year conditions, and management strategies to guide operations in multiple, sequential, dry years. Management strategies shall include water allocation approaches that assess risks and costs of meeting immediate and future water supply needs and instream flow requirements, considering the uncertainty of future inflows and the risk of drought. This effort shall be coordinated with development of carryover storage requirements required in Condition 3. Implementing dry-year operations strategies should be exhausted prior to using the process outlined in Condition 4 (Extremely Dry Conditions).

The Dry Year Management Plan shall be implemented upon approval of the Deputy Director and any other required approvals. The Licensee shall file with FERC the Deputy Director-approved Dry Year Management Plan, and any approved amendments thereto.

CONDITION 2. Ramping Rates

No later than one year following license issuance, the Licensee shall submit a Ramping Rate Plan to the Deputy Director for consideration for approval. The Deputy Director may require changes as part of any approval. The Licensee shall develop the Ramping Rate Plan for changes in flows, including pulse flows, in consultation with the agencies in the Merced River Watershed Group (Condition 6). The Ramping Rate Plan shall be developed and implemented to protect aquatic life health (e.g., prevent dewatering and stranding, promote natural fish behaviors) and provide adequate conditions to stimulate growth of riparian trees and shrubs. At a minimum, the Ramping Rate Plan shall include:

- Purpose of the plan;
- Aquatic species for which ramping rates were developed to protect;
- An assessment of which flows (if any), in addition to those required in Condition 1, require ramping rates;
- Methods or information used to determine ramping rates (e.g., studies, tests, monitoring, etc.), as well as identification of what additional studies or information are needed if interim ramping rates are proposed;
- A monitoring plan to verify adequate protections for aquatic life health (e.g., stranding, dewatering, fish behaviors, and mortality), and adequate stimulation of growth of riparian trees and shrubs. The plan may point to other monitoring required by this certification;
- Criteria for evaluating the effectiveness of the ramping rates;
- Schedule for reporting study and monitoring results to the agencies in the Merced River Watershed Group;
- Description of how planned facilities maintenance and operations will be designed to comply with ramping rates schedules whenever feasible;
- Proposed interim ramping rates, if applicable;
- Documentation of consultation with agencies in the Merced River Watershed Group (Condition 6), comments and recommendations made in connection with the development of the Ramping Rates Plan, and a description of how the Ramping Rates Plan incorporates or addresses the comments and recommendations; and
- How modifications to the Ramping Rates Plan will be implemented to address the need for updates to ramping rates throughout the term of the FERC license(s) and any extensions. After considering monitoring results from other conditions of this certification, or following recommendation(s) by one or more agency in the Merced River Watershed Group (Condition 6), the Deputy Director may require the Licensee to initiate consultation with the agencies of the Merced River Watershed Group to determine if the required ramping rates are protecting water quality and beneficial uses, and determine what, if any, adjustments are necessary. Following consultation, the Licensee shall provide the Deputy Director with a report summarizing the consultation process and any recommendations made by the Licensee and/or the Merced River Watershed Group regarding the need for updates to the ramping rates. The Deputy Director may require Licensee to develop, and implement, a plan to address needed modifications to the Ramping Rate Plan and submit such plan to the Deputy Director for review and consideration of approval. The Deputy Director may require changes as part of any approval.

A temporary variance from ramping rates may be granted if required by equipment malfunction beyond the reasonable control of the Licensee, as directed by law enforcement authorities or in emergencies.²⁵ Within 96 hours of beginning any unplanned temporary modification from ramping rates, the Licensee shall provide

²⁵ Refer to definition of emergencies presented in Condition 1.E.4 of this certification.

written notification to the Deputy Director including: a description of the event that necessitated the temporary modification, an update of the conditions associated with the modification, an estimated timeline for returning to compliance with certification requirements, and future actions the Licensee proposes to implement to avoid the need for a variance resulting from a similar event in the future, if appropriate.

The Ramping Rate Plan and any approved amendments thereto shall be implemented upon approval of the Deputy Director and any other required approvals. The Licensee shall file with FERC the Deputy Director-approved Ramping Rate Plan, and any approved amendments thereto.

CONDITION 3. Carryover Storage Requirements

No later than three months following license issuance, the Licensee shall initiate a collaborative effort through the Merced River Watershed Group (Condition 6) to develop proposed reservoir carryover storage and other reservoir requirements as needed (collectively referred to Carryover Storage Requirements) for Lake McClure. No later than 18 months following license issuance, the Licensee shall submit proposed Carryover Storage Requirements to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval.

In developing the Carryover Storage Requirements, the Licensee shall consider and incorporate site-specific information, local conditions, and knowledge from local experts. The feasibility of carryover storage options shall be evaluated and considered as part of developing the Carryover Storage Requirements. The Carryover Storage Requirements shall be designed to provide suitable stream temperatures, avoid significant adverse temperature or other impacts on fish and wildlife and, if feasible, on other beneficial uses. The Licensee shall target suitable temperature conditions for freshwater life stages of Chinook salmon and Central Valley steelhead, which are identified in Table 2 in Condition 8. The Carryover Storage Requirements shall include any monitoring and reporting that will be implemented (may include reference to monitoring conducted under other certification conditions), as well as updates to the requirements, if needed, during the term(s) of the FERC license(s). The Carryover Storage Requirements and any amendments thereto shall be implemented upon approval of the Deputy Director and any other required approvals. The Licensee shall file with FERC the Deputy Director-approved Carryover Storage Requirements, and any approved amendments thereto.

Prior to Deputy Director approval of Carryover Storage Requirements, the Licensee shall monitor and report temperature conditions and manage diversions, releases, and operations to achieve temperature targets (Table 2, Condition 8) in combination with approved biological goals.

The Deputy Director may require updates to the Deputy Director-approved Carryover Storage Requirements based on new information (e.g., the ability of Licensee to draw water from different reservoir elevations) supporting the need for changes to the requirements. If required by the Deputy Director, the Licensee shall consult with the

Merced River Watershed Group and provide the Deputy Director with proposed updates to the Carryover Storage Requirements, information supporting the proposed updates, and documentation of consultation with the Merced River Watershed Group and any comments or recommendations provided by the group as part of consultation. The Deputy Director may require changes as part of any approval.

CONDITION 4. Extremely Dry Conditions

In the event of extremely dry conditions, which may include when the Governor of the State of California declares a drought emergency for Merced and/or Mariposa counties, or multiple consecutive Dry or Critically Dry water years, the Licensee may request modification of the flow and related requirements, including carryover storage requirements, of this certification. If the Licensee anticipates that it may request modification pursuant to this condition, the Licensee shall notify the agencies in the Merced River Watershed Group (Condition 6), the Bureau of Land Management (BLM), and Deputy Director of the Licensee's concerns related to flows and related requirements as early as possible, and no later than March 15 of the calendar year in which a request may be submitted. If the Licensee requests modification pursuant to this condition, the Licensee shall develop a Revised Operations Plan in consultation with the agencies in the Merced River Watershed Group (Condition 6) and BLM for flows during the extremely dry conditions.

The Licensee shall provide interested parties with notice of the proposed Revised Operations Plan at least seven days prior to submittal to the Deputy Director. Whenever possible, the Licensee shall provide an opportunity for interested parties to comment on the proposed Revised Operations Plan prior to submittal to the Deputy Director, and provide such comments to the Deputy Director as part of submittal of the Revised Operations Plan. The Licensee's request shall include: an estimate of water to be saved and the alternative beneficial uses for which the water is being conserved; a timeline for the return to regular operations; proposed monitoring for the revised operations, including an estimation of any impacts the revised operations may have on any beneficial uses of water; identification of measures to reasonably protect beneficial uses under the circumstances; and proposed water conservation measures that will be implemented. If conservation measures are not applicable, the Licensee shall describe the circumstances and justification for not implementing water conservation measures.

The Licensee shall submit the proposed Revised Operations Plan to the Deputy Director for review and consideration for approval. The Licensee shall also provide a summary of any comments received and how the comments were addressed. The Deputy Director may require changes to the Revised Operations Plan as part of any approval. The Licensee may implement the Revised Operations Plan upon receipt of Deputy Director and other required approvals, in accordance with the schedule and requirements specified therein. The Licensee shall file with FERC the Deputy Director-approved Revised Operations Plan, and any approved amendments thereto.

CONDITION 5. Southern Delta Salinity Objective

The Licensee shall not divert water when, in order to meet the southern Delta salinity objective established in the Bay-Delta Plan, the United States Bureau of Reclamation (Reclamation) is releasing stored water from New Melones Reservoir to avoid exceedance of 0.7 deciSiemens/meter (dS/m) electrical conductivity (EC) at Vernalis (April – August) and 1.0 dS/m EC at Vernalis (September – March). In water years when Reclamation may release stored water from New Melones to achieve the Vernalis salinity objective, the Licensee shall consult with Reclamation and State Water Board staff on at least a monthly basis, and more often as needed, to determine whether this condition applies. The Deputy Director may modify or provide additional direction regarding the required consultation process.

This restriction shall not apply when, in the judgment of the Deputy Director, curtailment of diversion will not be effective in lowering the salinity concentration at Vernalis, when the Licensee is meeting flow requirements at the Merced River flow gage nearest the confluence, or when in the absence of the Licensee's diversion, hydraulic continuity would not exist between the Licensee's point of diversion and Vernalis. This restriction shall also not apply when, in the judgment of the Deputy Director, releases of stored water from New Melones to achieve salinity requirements would be unnecessary if Reclamation curtailed diversion of natural flow being diverted at other Reclamation facilities in the San Joaquin River watershed under water rights that are junior in priority to the Licensee.

This condition is not intended to relieve any other diverter of responsibility to contribute to achievement of the southern Delta salinity objective. If the Licensee is aware of any person or entity with a junior priority, or that is otherwise not entitled to divert at a given time, diverting or threatening to divert significant quantities of water at a time when the Licensee is required to bypass or release previously stored water under this condition, the Licensee should report that diversion or threatened diversion to the State Water Board for consideration of appropriate action to address that diverter's responsibility to contribute to achievement of the southern Delta salinity objective, as appropriate.

This condition shall apply unless and until modified through a proceeding by the State Water Board to allocate responsibility for meeting the southern Delta salinity objective in the Bay-Delta Plan.

CONDITION 6. Merced River and Regional Watershed Groups

6.A Merced River Watershed Group

No later than three months following license issuance, the Licensee shall establish and convene a Merced River Watershed Group for the purpose of consultation on Merced River focused ecological topics related to the development and review of plans and to provide recommendations to the Licensee as expressly provided for under the conditions of this certification. Examples of topics the Merced River Watershed Group shall consult on include, but are not limited to, the implementation, monitoring, and

effectiveness assessment of the flow requirements identified in this certification (Condition 1) and the coordination of Merced River flows with flows from the other salmon-bearing tributaries to the LSJR, specifically the Stanislaus and Tuolumne Rivers. The Licensee shall use information developed through membership coordination, recommendations, assessments, and other activities completed by the Merced River Watershed Group to support participation in the Lower San Joaquin River watershed group, discussed in the next section. In order to ensure adequate coordination, and unless they decline to participate, the Merced River Watershed Group shall include, at a minimum, and in addition to the Licensee's representative or representatives, representatives from the following entities who have expertise in San Joaquin River, fisheries management, hydrology, operations, land management, and monitoring and assessment needs: State Water Board, California Department of Fish and Wildlife (CDFW), National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), and other members identified by the Deputy Director. The State Water Board staff overseeing implementation of this water quality certification shall also be included in all meetings related to development of information or implementation of provisions of this certification. Depending on the topic, it is also highly recommended, and the Deputy Director may direct, that the Merced River Watershed Group include water diverters and users on the Merced River, tribes, and nongovernmental organizations with appropriate expertise.

The Merced River Watershed Group may convene individual committees, as needed, to address topic specific issues or to include additional expertise. The committees may include representatives from all or a subset of the entities of the watershed group as well as representatives from other sectors with appropriate expertise.

The Licensee is required to convene a Merced River Anadromous Fish Committee, a subgroup of the Merced River Watershed Group. The purpose of the Merced River Anadromous Fish Committee is to coordinate the sharing of fisheries related information, assess anadromous fish on the Merced River, and make recommendations to the Merced River Watershed Group and Lower San Joaquin River Watershed Group. The Merced River Anadromous Fish Committee shall provide recommendations regarding actions that should be implemented to support anadromous fish in the Merced River including but not limited to the implementation of Condition 1.B (pulse flows) and 1.D (Bay-Delta flows), habitat and fish passage actions, and monitoring, assessment, and science activities needed to support anadromous fish populations. The Licensee shall host the first meeting of the Merced River Anadromous Fish Committee no later than three months following license issuance. The Licensee shall organize and host all future meetings of the Merced River Anadromous Fish Committee. Meetings shall be held at least monthly unless otherwise agreed to by the committee. The Merced River Anadromous Fish Committee shall be comprised of one representative each from Merced ID, CDFW, NMFS, USFWS, the State Water Board, and a nongovernmental organization with anadromous fisheries expertise. Merced River Anadromous Fish Committee members shall be selected by each respective organization.

6.B Lower San Joaquin River Watershed Group (Regional Watershed Group)

The Licensee shall participate in a Lower San Joaquin River Watershed Group convened by the State Water Board or other appropriate regional watershed groups established to assist with the implementation, monitoring, and assessment of the Bay-Delta Plan. The Licensee shall participate in this watershed group informed by coordination and information produced through the Merced River Watershed Group and its committees. This regional watershed group may serve the purposes and functions of the Stanislaus, Tuolumne, and Merced Working Group (STM Working Group) as described in the Bay-Delta Plan. The State Water Board will seek recommendations from the regional watershed group regarding: biological goals; procedures for implementing the adaptive methods; annual adaptive operations plan; and the San Joaquin River Monitoring and Evaluation Program, including special studies and reporting requirements.

The regional watershed group shall include, at a minimum, representatives from the following entities that have expertise in Lower San Joaquin, Stanislaus, Tuolumne, and Merced Rivers fisheries management, hydrology, operations, and monitoring and assessment needs: CDFW; NMFS; USFWS; and water diverters and users on the Stanislaus, Tuolumne, and Merced Rivers. The regional watershed group shall also include State Water Board staff and may include any other persons or entities the Executive Director determines to have appropriate expertise, including nongovernmental organizations. To the extent practicable, the membership of the regional watershed group should achieve a balance of participant interests such that no one interest constitutes a majority of the group.

CONDITION 7. Annual Review Meeting

No later than one year following license(s) issuance, the Licensee shall establish an annual meeting that is open to the public to review and discuss implementation of the Merced Projects' license(s). At least 30 days prior to the meeting, the Licensee shall at a minimum notice the meeting on the Licensee's Merced Projects webpage(s) and invite the Merced River Watershed Group (Condition 6), BLM, and other interested stakeholder to participate in the annual review meeting. The Merced River Watershed Group shall establish communication protocols to facilitate interactions between group members that allow for open participation and communication between all parties.

The first annual review meeting shall be held no later than the first full calendar year after license(s) issuance. Annual review meetings shall be targeted for March – May. At the annual review meetings, the Licensee shall:

- Review the status of implementing the FERC license(s) and certification conditions;
- Review monitoring data from all monitoring conducted the previous year;

- Review upcoming elements of the current year maintenance plans and any non-routine maintenance anticipated between this annual meeting and the next annual meeting;
- Discuss foreseeable changes to the Merced Projects' facilities or features;
- Discuss the status of salmonid reintroduction plans;
- Discuss necessary revisions or modifications to plans approved as part of this certification; and
- Discuss species listing implications, including:
 - Needed protection measures for species newly listed as threatened, endangered, candidate, or sensitive;
 - Changes to existing plans for actions that may no longer be necessary due to delisting of a species; and
 - Changes to existing plans to incorporate new information about species requiring protection.

Materials shall be provided to the Merced River Watershed Group (Condition 6), BLM, and other known interested stakeholders at least 30 days prior to the annual meeting. The Licensee shall submit a report to the State Water Board that summarizes the annual review meeting no later than 60 days following each meeting. The report shall include a list of participants to the extent parties identified themselves, comments and recommendations made at the annual meeting, and any proposed actions Merced ID plans to pursue in light of and information provided at the meeting.

CONDITION 8. Water Quality Monitoring and Management

8.A Temperature Monitoring and Management

The Licensee shall take actions within its reasonable control to achieve the water temperatures outlined in Table 2 and any amendments to the temperature requirements as approved in the Licensee's Annual Operations Plan (Condition 1). No later than six months following license issuance, the Licensee shall submit a Water Temperature Monitoring and Management Plan to the Deputy Director for review and consideration of approval. The Deputy Director may require changes as part of any approval. The Licensee shall develop the Water Temperature Monitoring and Management Plan in consultation with the Merced River Anadromous Fish Committee (Condition 6). No later than six months following Deputy Director approval of the Water Temperature Monitoring and Management Plan, the Licensee shall install and operate water temperature monitoring devices to monitor compliance at the temperature requirement locations listed in Table 2. If other entities (e.g., DWR or USGS) have water temperature monitoring devices at locations listed in Table 2 that provide real-time data on a publicly available website then Merced ID does not need to install duplicate gages at those specific locations and the number of required gages may be reduced if approved by the Deputy Director. The Licensee shall use the gages/locations listed in Table 2 unless another location and/or gage at or downstream of the specified location is approved by the Deputy Director or the Deputy Director approves a reduced number of monitoring locations as noted in the preceding sentence. Up to four additional gages

with real-time data made available on a publicly available webpage may be required by the Deputy Director if additional water temperature information (e.g., Lake McClure inflow temperature and release temperature) is determined to be necessary to evaluate the effects of the Merced Projects on water temperatures. At a minimum, the Water Temperature Monitoring and Management Plan shall include:

- A statement of the goals and objectives of the plan;
- A description of proposed monitoring and associated protocols, including monitoring locations, schedule/frequency, equipment to be used, and the quality assurance project plan. The required water temperature monitoring gages shall be identified for immediate installation and use within six months of Deputy Director approval of the plan;
- A comprehensive description of factors related to the Merced Projects and factors not related to the Merced Projects that may affect water temperature in the Merced River below the Merced Projects including but not limited to river flows, the effect of Lake McClure reservoir storage volumes on water temperatures released from New Exchequer Dam and Crocker-Huffman diversion dam during September through November, a comparison of water temperatures of the Merced River flowing into Lake McClure compared to Lake McClure release water temperature in September through November. This description shall also identify whether each of the factors are associated with the Merced Projects;
- A comprehensive description of reasonable actions to achieve the temperature requirements, which may include temperature control structures (e.g., selective reservoir withdrawal structures), riparian shade and other restoration measures, adaptive implementation of Bay-Delta Plan LSJR flows, reservoir storage management (including carryover storage), modified or additional reservoir releases, cold water bypass, fish passage, and modified power supply operations. The plan shall also identify the actions the Licensee proposes to implement initially, any actions or studies the Licensee plans to explore for potential future implementation, and the schedule for implementation;
- A detailed reporting schedule, that includes:
 - Summarizing, evaluating, and reporting water temperature and related data; and
 - Posting monitoring data to a publicly available website in real-time (see Condition 1.E);
- If data indicate that the Merced Projects may be increasing water temperature and/or adversely affecting water quality, the Water Temperature Monitoring and Management Plan must include a plan for corrective measures and a timetable for implementation, including adjustments to the Merced Projects' operations and/or physical solutions;
- A description of the modeling and assumptions that will be used to develop annual operations plans (Condition 1) so that the Merced Projects can achieve the temperature requirements in Table 2 within the reasonable control of the Licensee;

- Any requests for modifications to the monitoring locations identified in Table 2, including supporting information for any proposed modifications. Proposed locations shall be selected with consideration for site accessibility, equivalency to existing location, and species presence and management; and
- A summary of any comments received in development of the plan and how the comments were addressed.

Table 2. Merced River Temperature Requirements

Time Period	Water-Year Type (Condition 1)	Maximum Daily Temperature	Location¹
January 1 – February 14	Wet Above Normal Below Normal Dry Critically Dry	13°C (55.4°F)	Shaffer Bridge (RM 32.5) Shaffer Bridge (RM 32.5) River Mile 38 River Mile 45 Snelling – G St (RM 46.5)
February 15 – April 30 February 15 – March 31 February 15 – March 15 February 15 – March 15 February 15 – 28/29	Wet Above Normal Below Normal Dry Critically Dry	16°C (60.8°F)	Confluence RM 2.5
April 1 – April 30 March 16 - April 30 March 16 - April 30 March 1 – April 30	Above Normal Below Normal Dry Critically Dry	18°C (64.4°F)	RM 14 RM 27 RM 27 RM 38
May 1 – June 30 May 1 – June 30 May 1 – June 30 May 1 – June 30 May 1 – May 31	Wet Above Normal Below Normal Dry Critically Dry	18°C (64.4°F)	RM 27 RM 27 RM 38 RM 38 RM 38
July 1 – October 31 July 1 – October 31 July 1 – October 31 July 1 – October 31 June 1 – October 31	Wet Above Normal Below Normal Dry Critically Dry	18°C (64.4°F)	RM 49
November 1 – 30	Wet Above Normal Below Normal Dry Critically Dry	13°C (55.4°F)	Shaffer Bridge (RM 32.5) Shaffer Bridge (RM 32.5) River Mile 38 River Mile 45 Snelling – G St (RM 46.5)
December 1 – 31	All water years	13°C (55.4°F)	Shaffer Bridge (RM 32.5)

Abbreviation: RM – River Mile

¹ Alternative locations may be approved by the Deputy Director as part of approval of the Water Temperature Monitoring and Management Plan.

Inability to Meet Temperature Requirements Due to Uncontrollable Factors. If the Licensee is unable to meet the temperature requirements of this certification due to an event or circumstance beyond its reasonable control, the Licensee shall file a notice with the Deputy Director within 10 days of such event or circumstance. The notice shall describe the event or circumstance causing the inability to meet the requirement. Such notice shall include a statement of specific actions that the Licensee has or will take to address the event or circumstance and how it will manage the cold-water pool or river flow to minimize exceedances of Table 2. If the Deputy Director finds that there is a pattern of exceedances within the Licensee's reasonable control that could result in adverse impacts to fishery resources, the Deputy Director may require remedial action to address the exceedances (e.g., requiring the Licensee to file a plan identifying any feasible measures that the Licensee may undertake, requiring the Licensee to file modifications to license(s) requirements, directing implementation of corrective actions or updates to the Water Temperature Monitoring and Management Plan, etc.) in addition to other actions within the State Water Board's authority.

The Deputy Director may require updates to the Water Temperature Monitoring and Management Plan based on information demonstrating Merced Projects'-related actions within the reasonable control of the Licensee are resulting in water temperature related impacts to beneficial uses. Any updates to the Water Temperature Monitoring and Management Plan shall be developed by the Licensee in consultation with the Merced River Anadromous Fish Committee and submitted to the Deputy Director for review and consideration of approval within the timeline designated by the Deputy Director. The proposed updates to the Water Temperature Monitoring and Management Plan shall include supporting documentation, and any comments made as part of consultation with information on how such comments were considered.

The Licensee shall implement the Water Temperature Monitoring and Management Plan and any amendments thereto upon receipt of Deputy Director and other required approvals, in accordance with the schedule and requirements specified therein. The Licensee shall file with FERC the Deputy Director-approved Water Temperature Monitoring and Management Plan, and any approved amendments thereto.

8.B Dissolved Oxygen Management

The Licensee shall take all actions within its reasonable control to meet the dissolved oxygen water quality objectives reflected in Table 3 below and any amendments thereto as approved in the Licensee's Annual Operations Plan (Condition 1). No later than six months following license issuance, the Licensee shall submit a Dissolved Oxygen Management Plan to the Deputy Director for review and consideration of approval. The Deputy Director may require changes as part of any approval. The Licensee shall develop the Dissolved Oxygen Management Plan in consultation with the Merced River Anadromous Fish Committee (Condition 6) and Central Valley Regional Water Quality Control Board (Central Valley Regional Water Board) staff. No later than 18 months following license issuance, the Licensee shall operate a minimum of two continuous real-time dissolved oxygen monitoring stations to measure compliance with the two

dissolved oxygen water quality objectives for the Merced River (Table 3). At a minimum, the Dissolved Oxygen Management Plan shall include:

- A statement of goals and objectives for the plan;
- A description of proposed monitoring and associated protocols, including monitoring locations, frequency (i.e., continuous), equipment to be used, and the quality assurance project plan;
- A comprehensive description of the Merced Projects’ impact on dissolved oxygen concentrations in the Lower Merced River. This description shall also identify the magnitude of the Merced Projects’ impact in relationship to other environmental factors influencing dissolved oxygen in the Merced River;
- A minimum of two continuous real-time dissolved oxygen monitoring stations to measure compliance with the two dissolved oxygen water quality objectives identified in the Central Valley Regional Water Board’s *Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin* (SR/SJR Basin Plan) (Central Valley Regional Board, 2019) for the Merced River, and evaluation of the need for additional dissolved oxygen monitoring stations to inform habitat suitability;
- A detailed reporting schedule that includes:
 - Summarizing, evaluating, and reporting on the dissolved oxygen data; and
 - Posting monitoring station data to a publicly available website in real-time (see Condition 1.E);
- A plan for corrective measures and a timetable for implementation if data indicate that the Merced Projects may be decreasing dissolved oxygen concentrations and/or adversely affecting water quality;
- A description of the modeling and assumptions or data that will be used to develop annual operation plans (Condition 1) to meet the dissolved oxygen requirements in Table 3; and
- A summary of any comments received in development of the plan and how the comments were addressed.

Table 3. Merced River Dissolved Oxygen Water Quality Objectives¹

River Section	Water Quality Objective (mg/l)¹	Time Period
Merced River from Cressy to New Exchequer Dam	8.0	All Year
Merced River from Cressy to the confluence with San Joaquin River	7.0	All Year

¹SR/SJR Basin Plan. Dissolved oxygen concentrations below the levels presented in this table are prohibited at all times.

Inability to Meet Dissolved Oxygen Requirements Due to Uncontrollable Factors. If Licensee is unable to meet the dissolved oxygen requirements of this certification due to an event or circumstance beyond its reasonable control, Licensee shall file a notice with the Deputy Director within 10 days of such event or circumstance. The notice shall describe the event or circumstance causing the inability to meet the requirement. Such notice shall include a statement of specific actions that Licensee has or will take to address the event or circumstance and how it will manage the cold-water pool or river flow to minimize exceedances of the dissolved oxygen objectives (Table 3). If the Deputy Director finds that there is a pattern of exceedances within Licensee's reasonable control that could result in adverse impacts to fishery resources, the Deputy Director may require remedial action to address the exceedances (e.g., requiring Licensee to file a plan identifying any feasible measures that Licensee may undertake, require Licensee to update the plan and/or file modifications to license(s) requirements, etc.).

The Deputy Director may require updates to the Dissolved Oxygen Management Plan based on information demonstrating Merced Projects'-related actions within the reasonable control of Licensee are resulting in dissolved oxygen related impacts to beneficial uses or updates to the SR/SJR Basin Plan. Any updates to the Dissolved Oxygen Management Plan shall be developed by Licensee in consultation with the Merced River Anadromous Fish Committee and submitted to the Deputy Director for review and consideration of approval within the timeline designated by the Deputy Director. The proposed updates to the Dissolved Oxygen Management Plan shall include supporting documentation, and any comments made as part of consultation with information on how such comments were considered.

Licensee shall implement the Dissolved Oxygen Management Plan and any amendments upon receipt of Deputy Director and other required approvals, in accordance with the schedule and requirements specified therein. Licensee shall file with FERC the Deputy Director-approved Dissolved Oxygen Management Plan, and any approved amendments thereto.

8.C Mercury Monitoring and Management

No later than one year following license issuance, the Licensee shall submit a Mercury Monitoring and Management Plan to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. Licensee shall develop the Mercury Monitoring and Management Plan consistent with the State Water Board's May 2, 2012 *Part 2 Of The Water Quality Control Plan For Inland Surface Waters, Enclosed Bays, And Estuaries Of California—Tribal And Subsistence Fishing Beneficial Uses And Mercury Provisions*, and in consultation with the California Department of Public Health, Office of Environmental Health Hazard Assessment, State Water Board, and Central Valley Regional Water Board staff. At a minimum, the Mercury Monitoring and Management Plan shall include:

- A statement of goals and objectives for the plan;

- A description of proposed monitoring protocols and locations (within the reservoirs and river), including aqueous methylmercury and inorganic mercury, fish tissue mercury, sediment mercury, and other ancillary parameters that affect mercury cycling (e.g., chlorophyll-a, dissolved organic carbon, and redox-potential);
- A comprehensive description of procedures, including coordination with the California Department of Public Health and Office of Environmental Health Hazard Assessment to develop notification procedures that will be implemented to inform the public if hazardous levels of mercury are found in fish tissue;
- An evaluation of risks to piscivorous wildlife;
- A detailed reporting schedule;
- Proposed reservoir operations and fisheries adaptive management to reduce methylmercury pollution (e.g., bioaccumulation, methylation, and risks to piscivorous wildlife and human fish consumers);
- A plan for corrective measures and a timetable for implementation, if data indicate that the Merced Projects may be increasing bioavailable mercury concentrations and/or adversely affecting water quality; and
- A summary of any comments received in development of the plan and how the comments were addressed.

Licensee shall implement the Mercury Monitoring and Management Plan upon receipt of Deputy Director and other required approvals, in accordance with the schedule and requirements specified therein. Licensee shall file with FERC the Deputy Director-approved Mercury Monitoring and Management Plan, and any approved amendments thereto.

8.D Other Constituents Monitoring and Management

No later than one year following license issuance, Licensee shall submit an Other Constituents Monitoring and Management Plan to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. The Other Constituents Monitoring and Management Plan shall be developed in coordination with the Merced River Watershed Group (Condition 6) and the Central Valley Regional Water Board. At a minimum, the Other Constituents Monitoring and Management Plan shall include:

- A statement of goals and objectives for the plan;
- A description of proposed monitoring and associated protocols, including monitoring locations, frequency (e.g., continuous), equipment to be used, and the quality assurance project plan;
- A comprehensive description of the Merced Projects' impact on concentrations of constituents that will be monitored per the plan (see next bullet) in Lake McClure, McSwain Reservoir, and the Lower Merced River. This description shall also identify the magnitude of the Merced Projects' impact in relationship to other factors influencing the constituents in the Merced River;

- A description of water quality parameters to be monitored that include, but are not limited to, those identified in the 303(d) listing: water temperature (covered in Condition 8.A), dissolved oxygen (covered in Condition 8.B), mercury (covered in Condition 8.C), Group A pesticides (aldrin, dieldrin, chlordane, endrin, heptachlor, heptachlor epoxide, hexachlorocyclohexanes [including lindane], endosulfan, and toxaphene), and unknown toxicity;
- A description of water quality parameters to be monitored in the Merced River as part of the Waste Discharge Requirements General Order For Growers Within The Eastern San Joaquin River Watershed That Are Members Of The Third-Party Group (Central Valley Regional Water Board Order [R5-2012-0116-11](#)²⁶) and any amendments thereto;
- Current water quality objectives for the parameters and monitoring requirements provided in the SR/SJR Basin Plan, Bay-Delta Plan, and amendments thereto;
- Description of options to reduce 303(d) listed pollutant levels, and a plan for corrective measures and a timetable for implementation, if data indicate that the Merced Projects may be adversely affecting water quality;
- A summary of any comments received in development of the plan and how the comments were addressed; and
- A detailed reporting schedule that includes summarizing, evaluating, and reporting on the data.

The Deputy Director may require updates to the Other Constituents Monitoring and Management Plan based on information demonstrating Merced Projects'-related actions within the reasonable control of Licensee are resulting in impacts to beneficial uses or based on updates to the SR/SJR Basin Plan. Any updates to the Other Constituents Monitoring and Management Plan shall be developed by Licensee in consultation with the Merced River Watershed Group and Central Valley Regional Water Board and submitted to the Deputy Director for review and consideration of approval within the timeline designated by the Deputy Director. The proposed updates to the Other Constituents Monitoring and Management Plan shall include supporting documentation, and any comments made as part of consultation with information on how such comments were considered.

Licensee shall implement the Other Constituents Monitoring and Management Plan and any amendments thereto upon receipt of Deputy Director and other required approvals, in accordance with the schedule and requirements specified therein. Licensee shall file with FERC the Deputy Director-approved Other Constituents Monitoring and Management Plan, and any approved amendments thereto.

²⁶ Central Valley Regional Water Quality Control Board. 2012. Waste Discharge Requirements General Order for Growers within the Eastern San Joaquin River Watershed that are Members of a Third-Party Group. Revised October 2021. Available online at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2012-0116-11.pdf (Accessed: January 23, 2025).

CONDITION 9. Large Woody Material Management

No later than one year following license(s) issuance, Licensee shall submit a Large Woody Material Management Plan (LWMMP) to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. The LWMMP shall be designed to provide additional native resident and migratory fish rearing habitat in the Merced River by creating additional cover, edge, and channel complexity through the addition of structural habitat, including large woody debris, boulders, and other objects. The LWMMP shall be developed in consultation with BLM, USFWS, NMFS, CDFW, California Department of Transportation (Caltrans), and State Water Board staff. At a minimum, the LWMMP shall include:

- Specific objectives, including a description of: (a) what constitutes large woody material (i.e., size criteria) that will be captured, removed, stored, and placed as part of this condition; (b) how other woody material will be handled or disposed of as part of the Merced Project's operations; and (c) what other materials (e.g., boulders) will be used;
- Proposed monitoring to assess the effectiveness of the plan (e.g., mobilization and distribution of large woody material and other approved materials);
- Detailed description of the methods, locations, volume, and frequency of large woody material capture, removal, storage, and placement for large woody material collected from Lake McClure and McSwain Reservoir, including options and how large woody material collected in Lake McClure and McSwain Reservoir will be deposited downstream of Crocker-Huffman diversion dam;
- Identification of suitable locations in the Merced River downstream of Crocker-Huffman diversion dam where large woody material can be placed and be passively mobilized by two to five-year high flow events, or where it would be appropriate to anchor large woody material;
- A monitoring and reporting program that describes how Licensee will evaluate and report on the performance of large woody material management efforts. The program shall include the criteria that will be used to evaluate the performance of large woody material management measures. Licensee shall propose updates, if appropriate, to the LWMMP based on the monitoring results. Reports shall be submitted to the Deputy Director, BLM, Caltrans, CDFW, NMFS, and USFWS;
- An adaptive management program that describes how Licensee plans to adjust large woody material management and monitoring methods based on evaluation of information and monitoring resulting from implementation of the LWMPP; and
- Documentation of consultation with BLM, USFWS, NMFS, CDFW, Caltrans, and State Water Board staff, including comments and recommendations made in connection with the LWMMP, and a description of how the LWMMP incorporates or addresses the comments and recommendations.

Large woody material shall not be stockpiled on BLM land, especially in the Piney Creek Red-legged Frog Core Area. Licensee shall consider guidance from the *National Large Wood Manual* (Bureau of Reclamation and ERDC, 2016) and *Integrating Recreational Boating Considerations into Stream Channel Modification & Design Projects* (Colburn,

2012). Licensee shall report on large woody material management for the previous year at the Annual Review Meeting (Condition 7).

The Deputy Director may require updates to the LWMMP based on information demonstrating large woody material measures are not protecting beneficial uses. Any updates to the LWMMP shall be developed by Licensee in consultation with the BLM, USFWS, NMFS, CDFW, Caltrans, and State Water Board staff and submitted to the Deputy Director for review and consideration of approval within the timeline designated by the Deputy Director. The proposed updates to the LWMPP shall include supporting documentation, and any comments made as part of consultation with information on how such comments were considered.

Licensee shall file with FERC the Deputy Director-approved LWMMP, and any approved amendments thereto. Licensee shall implement the LWMMP and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

CONDITION 10. Erosion and Sediment Management

No later than one year following license(s) issuance, Licensee shall submit an Erosion and Sediment Control Management Plan (Erosion and Sediment Plan) to the Deputy Director for review and consideration of approval. Licensee may require changes as part of any approval. The Erosion and Sediment Plan shall be developed in consultation with BLM, CDFW, USFWS, NMFS, Caltrans, and State Water Board staff. The primary goal of the Erosion and Sediment Plan shall be to address and control the Merced Projects-related erosion and sedimentation during the term of the new license(s) and any extensions. At a minimum, the Erosion and Sediment Plan shall include:

- The goal, purpose, and scope of the plan;
- Periodic inventories of the entire area of the Merced Projects to identify and assess sites with existing or potential erosion and sedimentation issues. The plan shall identify a timeline for the inventories;
- Criteria for ranking and treating erosion sites identified as part of the inventories, including a risk rating and hazard assessment for scheduling erosion treatment measures and monitoring at each existing or potential erosion site;
- Protocols for monitoring completed erosion control treatment measures for a period of up to three years after treatment to determine the effectiveness of erosion control measures and whether further erosion control measures are necessary;
- Process and timeline for submittal of the periodic inventories, including associated information and monitoring of existing and potential sites, to the Deputy Director. If the inventory indicates existing or new sites with Merced Projects-related erosion and sedimentation issues, Licensee shall prepare an amendment to the plan for Deputy Director review and approval. The plan amendment shall be prepared in consultation with BLM, CDFW, USFWS, NMFS, Caltrans, and State Water Board staff and submitted to the Deputy Director

within six months of submitting the periodic inventory to the Deputy Director. The plan amendment shall include: (a) a ranking of the sites based on the criteria used for ranking and treating erosion sites; (b) a timeline for addressing sites with erosion and sedimentation issues; (c) measures/treatments that will be implemented to address erosion and sedimentation issues at each site; (d) measures that will be implemented to protect water quality and beneficial uses; (e) monitoring of sites to evaluate effectiveness of implemented measures/treatments; and (f) reporting;

- Temporary measures that will be implemented to stabilize any erosion or sediment issues pending additional measures or treatments to address the ranked sites;
- Site-specific temporary erosion control measures that will be implemented during construction-related activities;
- A monitoring and reporting program that describes how Licensee will evaluate and report on the performance of erosion and sedimentation control efforts. The program shall include the criteria that will be used to evaluate the performance of erosion and sedimentation control management measures and propose changes to the measures/treatments;
- Protocols for emergency erosion and sediment control that will be implemented upon notice to the Deputy Director, outside of the timeline and process outlined above; and
- Documentation of consultation with BLM, CDFW, USFWS, NMFS, Caltrans, and State Water Board staff, comments and recommendations made in connection with the plan, and a description of how the plan incorporates or addresses the comments and recommendations.

Licensee shall comply with the *National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit; State Water Board 2022a)²⁷ and any amendments thereto. If there is a conflict between the conditions of this certification and applicable conditions in the Construction General Permit, the more stringent shall apply.

Licensee shall file with FERC the Deputy Director-approved Erosion and Sediment Plan, and any approved amendments thereto. Licensee shall implement the Erosion and Sediment Plan and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

²⁷ State Water Board Order No. 2009-0009-DWQ and NPDES No. CAS000002, as amended by Order No. 2010-0014-DWQ, Order No. 2012-0006-DWQ, Order No. 2022-0057-DWQ, and any amendments thereto. Available online at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction/general_permit_reissuance.html. (Accessed: January 16, 2025).

CONDITION 11. Gravel Augmentation

No later than one year following license(s) issuance, Licensee shall submit a Gravel Augmentation Plan to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. The Gravel Augmentation Plan shall be developed in consultation with BLM, CDFW, USFWS, NMFS, and State Water Board staff. A primary goal of the Gravel Augmentation Plan shall be to develop specifications for gravel augmentation in the Lower Merced River, including the addition of coarse gravel to fill bedload traps and provide spawning gravel downstream of Crocker-Huffman diversion dam. The Gravel Augmentation Plan shall be designed with consideration of sediment budgets that exceed the river's ability to transport, so that over time the system becomes less incised. At a minimum, the Gravel Augmentation Plan shall include:

- The purpose, goals, and scope of the plan;
- Identification of coarse gravel and spawning gravel sizes to be used for gravel augmentation;
- Identification of gravel harvesting sources and storage sites;
- Method for removal, sorting, and cleaning the source gravel, as well as disposal of any byproducts associated with the process;
- Identification of locations and methods for gravel introduction/placement, and any facilities or improvements necessary to access the Merced River and place gravel;
- Coordination with activities under the Riparian and Floodplain Improvement Plan (Condition 12);
- A schedule for gravel placement with provisions for an initial placement of 50,000 cubic yards of coarse gravel at suitable augmentation sites downstream of Crocker-Huffman diversion dam to fill bedload traps and for annual placement of 2,600 cubic yards of spawning gravel in the Lower Merced River;
- Gravel placement methods;
- Schedule and methods for monitoring mobilization of gravel dispersal;
- Measures that Licensee will take to reasonably protect water quality, including fish and wildlife beneficial uses, during gravel augmentation related activities, including sourcing materials;
- A monitoring and reporting program that describes how Licensee will evaluate and report on the performance of gravel augmentation efforts. The program shall include the criteria that will be used to evaluate the performance of gravel augmentation management measures. Monitoring shall include an evaluation of the effectiveness of gravel augmentation activities at providing spawning substrate, including identification of whether the gravels are being used, the quality of spawning habitat being created, and success in meeting the plan's goals. Licensee shall propose any updates to the plan based on the monitoring results. Reports shall be submitted to the Deputy Director, BLM, CDFW, NMFS, and USFWS;
- An adaptive management program that describes how Licensee plans to adjust gravel placement and monitoring methods based on evaluation of information

and monitoring resulting from implementation of the plan. The adaptive management shall include evaluation of the initial fill volumes and propose additional annual placement of coarse and spawning gravels, as needed, based on NMFS' submittals to FERC related to successful infill of bedload traps and suitable spawning gravels in the Lower Merced River (NMFS, 2014) (NMFS, 2016); and

- Documentation of consultation with BLM, CDFW, USFWS, NMFS, and State Water Board staff, including comments and recommendations made in connection with the plan, and a description of how the plan incorporates or addresses the comments and recommendations.

The Deputy Director may require additional gravel augmentation based on monitoring results, as part of adaptive management implementation of the Gravel Augmentation Plan. Licensee shall file with FERC the Deputy Director-approved Gravel Augmentation Plan, and any approved amendments thereto. Licensee shall implement the Gravel Augmentation Plan and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

CONDITION 12. Riparian and Floodplain Improvements

No later than one year following license(s) issuance, Licensee shall submit a Riparian and Floodplain Improvement Plan to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. The Riparian and Floodplain Improvement Plan shall be developed in consultation with the agencies in the Merced River Anadromous Fish Committee (Condition 6). The Riparian and Floodplain Improvement Plan shall describe the phased program (phases described below) Licensee will implement to restore, enhance, and protect riparian and other floodplain habitats to support fish and wildlife beneficial uses. The Riparian and Floodplain Improvement Plan shall incorporate expected flow volumes associated with implementation of the Bay-Delta Plan LSJR flow objectives in its design and include a definition of high flow events. Licensee shall include with the plan copies of the comments, including recommendations, made in the course of consultation, and an explanation as to how the plan incorporates or addresses the comments and recommendations. Licensee shall file with FERC the Deputy Director-approved Riparian and Floodplain Improvement Plan, and any approved amendments thereto. Licensee shall implement the Riparian and Floodplain Improvement Plan and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

The program set forth in the Riparian and Floodplain Improvement Plan shall be implemented in the following three phases:

- Phase 1. No later than one year following license(s) issuance, as part of submittal of the Riparian and Floodplain Improvement Plan, and in consultation with the agencies in the Merced River Anadromous Fish Committee (Condition 6), Licensee shall provide a screening level analysis of proposed

riparian/floodplain improvement projects, including an evaluation of the feasibility and benefits of constructing 40 – 125 acres of floodplain habitat near spawning habitats throughout the lower Merced River, with some portion of constructed acres designed to activate at flows lower than existing bank full flow values (e.g., between 500 and 700 cfs), a determination of floodplain activation flows for each project, and an evaluation of how flood/pulse flows may contribute to floodplain values and benefit fish and wildlife species. This phase shall include the identification of a Phase 1 recommended alternative, and relevant information from the Gravel Augmentation Plan (Condition 11) and coordination with Gravel Augmentation Plan activities, as it applies to any proposed restoration activities.

- Phase 2. No later than two years following license(s) issuance and in consultation with the agencies in the Merced River Anadromous Fish Committee (Condition 6), Licensee shall initiate Phase 2 of the program. Phase 2 shall begin with an evaluation of the full scope and feasibility of the Phase 1 recommended alternative and development of an implementation schedule for the alternative, as approved by the Deputy Director as part of review and approval of the Riparian and Floodplain Improvement Plan. Within four years of license issuance, Licensee shall submit the Phase 1 recommended alternative and implementation schedule to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of the approval. Licensee shall file with FERC the Deputy Director's approval of the Phase 1 recommended alternative and implementation schedule and any approved amendments thereto. Licensee shall implement the Phase 1 recommended alternative upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein. In no case shall the following timelines be exceeded:
 - No later than eight years following license(s) issuance, Licensee shall complete the final design, perform pre-construction monitoring to support development of a Before-After-Control-Impact (BACI) analysis, and commence construction of the approved alternative; and
 - No later than 10 years following license(s) issuance Licensee shall fully implement the approved alternative.
- Phase 3. Following full implementation of the approved alternative (i.e., completion of Phase 2), Licensee shall annually collect data appropriate for evaluating the effectiveness of the riparian and floodplain improvement program and the achievement of the program objectives. Licensee shall use monitoring results to develop a BACI analysis. Licensee shall implement an adaptive management process to employ additional measures needed to achieve program objectives. Licensee shall prepare an annual summary report describing monitoring and implementation activities completed pursuant to this condition and submit the report to the agencies of the Merced River Anadromous Fish Committee (Condition 6), for review on an annual basis.

Licensee, in consultation with the agencies of the Merced River Anadromous Fish Committee (Condition 6), shall reevaluate the Riparian and Floodplain Improvement Plan every five years after initial implementation of Phase 3 and provide a comprehensive report that evaluates the effectiveness of the program. If any changes are recommended by the agencies of the Merced River Anadromous Fish Committee beyond the objectives, activities, or schedules approved by the Deputy Director, Licensee shall submit recommendations in a revised Riparian and Floodplain Improvement Plan to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. Licensee shall include with the revised plan copies of the comments, including recommendations, made in the course of consultation with the agencies, and an explanation as to how the plan incorporates or addresses the comments and recommendations.

CONDITION 13. Predator Suppression

No later than one year following license(s) issuance, Licensee shall submit a Predator Suppression Plan to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. Licensee shall create the Predator Suppression Plan in consultation with the agencies of the Merced River Anadromous Fish Committee (Condition 6). At a minimum, the Predator Suppression Plan shall include:

- The goals and objectives of the plan;
- An evaluation of the effects that predators have on native resident and migratory fish, including predator density in the Merced River, alternative prey, juvenile residence time, refuge habitat availability, and impacts of predation on native resident and migratory fish survival rates;
- Identification of gravel pits, scour pools, ponds, weirs, diversion dams, submerged aquatic vegetation, and other structures or areas, that support significant numbers of non-native fish and predators that may currently reduce native resident and migratory fish survival;
- Actions Licensee will implement to reduce predation and non-native fish effects and to improve native resident and migratory fish success. Action may include modification of priority structures and areas or other appropriate actions (e.g., predator removal);
- Coordination with actions required by other conditions of this certification (e.g., large woody material placement, floodplain habitat refuge for juvenile native resident and migratory fish, and temperature management) to maximize predator suppression and native resident and migratory fish survival;
- A monitoring and reporting program that describes how Licensee will evaluate and report on the performance of plan implementation. The program shall include the criteria that will be used to evaluate plan implementation and propose changes; and

- Documentation of consultation with agencies, including comments and recommendations made in connection with the plan, and a description of how the plan incorporates or addresses the comments and recommendations.

Licensee shall file with FERC the Deputy Director-approved Predator Suppression Plan, and any approved amendments thereto. Licensee shall implement the Predator Suppression Plan and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

CONDITION 14. Aquatic Invasive Species Management

No later than two years following license(s) issuance, Licensee shall submit an Aquatic Invasive Species Management Plan (Invasive Species Plan) to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. The Invasive Species Plan shall be developed in consultation with BLM, CDFW, USFWS, NMFS, Central Valley Regional Water Board, and State Water Board staff. The Invasive Species Plan shall provide guidance to manage aquatic invasive species that occur or have the potential to occur in the Merced Projects-affected waters. The goals of the Invasive Species Plan are to: (1) identify and implement best management practices (BMPs) to minimize and prevent the introduction and spread of aquatic invasive species into and throughout the Merced Projects-affected waters; (2) provide education and outreach to ensure public awareness of the potential effects of aquatic invasive species throughout the Merced Projects-affected waters and actions needed to avoid or address them; (3) develop and implement monitoring programs to ensure early detection of aquatic invasive species; and (4) monitor the spread of established aquatic invasive species. At a minimum, the Invasive Species Plan shall include:

- The purpose of the plan;
- Identification of aquatic invasive species that occur or have the potential to occur in the Merced Projects-affected waters. For those that occur, include information on where the aquatic invasive species occurs and its density;
- BMPs that will be implemented to manage aquatic invasive species;
- An education and outreach program that will be implemented to ensure public awareness and actions to avoid the introduction and spread of aquatic invasive species;
- A monitoring and reporting program that will be implemented to ensure early detection of new aquatic invasive species and monitor the spread or reduction of established aquatic invasive species. The monitoring program shall include the species that will be monitored for, monitoring protocols, frequency, and locations. The program shall describe how Licensee will evaluate and report on the performance of aquatic invasive species management efforts. The program shall include the criteria that will be used to evaluate the performance of aquatic invasive species management measures. The reports shall include identification of changes associated with the presence of aquatic invasive species in the

Merced Projects-affected waters and recommendations to address the presence. Licensee shall propose any updates to the plan based on the monitoring results or other available information. Reports shall be submitted to BLM, CDFW, USFWS, Central Valley Regional Water Board, and the Deputy Director;

- An adaptive management program that describes how Licensee plans to adjust aquatic invasive species monitoring methods based on evaluation of information and monitoring resulting from implementation of the plan. The Deputy Director may direct Licensee to implement additional measures as needed to adaptively manage changes in aquatic invasive species location, abundance, and other factors in the Merced Projects-affected waters to ensure the protection of water quality and beneficial uses; and
- Documentation of consultation with BLM, CDFW, USFWS, and State Water Board staff, including comments and recommendations made in connection with the plan, and a description of how the plan incorporates or addresses the comments and recommendations.

The Deputy Director may require updates to the Invasive Species Plan based on information demonstrating aquatic invasive species measures are not protecting beneficial uses. Any updates to the Invasive Species Plan shall be developed by Licensee in consultation with the BLM, CDFW, USFWS, Central Valley Regional Water Board, and State Water Board staff and submitted to the Deputy Director for review and consideration of approval within the timeline designated by the Deputy Director. The proposed updates to the Invasive Species Plan shall include supporting documentation, and any comments made as part of consultation with information on how such comments were considered.

Licensee shall file with FERC the Deputy Director-approved Invasive Species Plan, and any approved amendments thereto. The Licensee shall implement the Invasive Species Plan and any amendments thereto upon receipt of Deputy Director approval and any other required approvals, in accordance with the schedule and requirements specified therein.

CONDITION 15. Merced National Wildlife Refuge

No later than two years following license(s) issuance, Licensee shall submit a Merced National Wildlife Refuge Plan (NWR Plan) to the Deputy Director for review and consideration for approval. The NWR Plan shall be developed to provide information on how Licensee will coordinate with USFWS and ensure delivery of 15,000 AF of water annually to the NWR. The Deputy Director may require changes as part of any approval. The NWR Plan shall be developed in consultation with BLM, CDFW, USFWS, and State Water Board staff. The purpose of the NWR Plan is to support the habitat needs of wintering waterfowl and other waterbirds, particularly between September and January when the water provides the most benefit. Licensee shall ensure the year-round delivery of 15,000 AF of water to the Merced National Wildlife Refuge. The NWR Plan shall include the water delivery schedule in Table 4, unless otherwise approved by the Deputy Director.

Table 4. Merced National Wildlife Refuge Water Delivery Schedule

Month	Delivery in Acre-feet
September	2,700
October	2,700
November	1,900
December	1,100
January	1,100
February	600
March	600
April	600
May	900
June	900
July	1,100
August	800

Licensee shall file with FERC the Deputy Director approved NWR Plan, and any approved amendments thereto. Licensee shall implement the NWR Plan and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein. Licensee shall also file with FERC any Deputy Director approvals of changes to the delivery schedule in Table 4.

CONDITION 16. Recreation Facilities Monitoring and Management

No later than two years following license(s) issuance, Licensee shall submit a Recreation Facilities Management Plan (Recreation Plan) to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. The Recreation Plan shall be developed in consultation with BLM, CDFW, USFWS, and State Water Board staff. At a minimum, the Recreation Plan shall include:

- A description of operations and maintenance activities associated with the Merced Projects’ recreation facilities that have the potential to impact water quality, and measures that will be implemented to address any impacts;
- Identification of recreation use surveys that will be conducted as part of the Project and submittal of the associated results to State Water Board staff. If results of the survey indicate an increase in recreation use, Licensee shall evaluate the potential effects to determine whether modifications to Merced Projects’ recreation facilities are needed to protect water quality and beneficial uses and provide the Deputy Director with the analysis and any associated recommendations for review and consideration of approval;
- A list, description, and schedule for modifications to existing and construction of new recreation facilities associated with the Merced Projects. For each facility modification or construction, Licensee shall prepare and implement, once approved by the Deputy Director, a Water Quality Monitoring and Protection Plan (Condition 20) that outlines measures and monitoring Licensee will implement to protect water quality, beneficial uses, and aquatic biological resources;

- A reporting program to document, summarize, and analyze completion of recreation facility construction or modification and associated monitoring results; and
- Documentation of consultation with BLM, CDFW, USFWS, and State Water Board staff, comments and recommendations made in connection with the plan, and a description of how the plan incorporates or addresses the comments and recommendations.

The Deputy Director may require updates to the Recreation Plan based on information demonstrating existing recreation facilities are impacting water quality and not protecting beneficial uses, or changes to an existing recreation facility or construction of a new recreation facility has the potential to impact water quality and beneficial uses. Any updates to the Recreation Plan shall be developed by Licensee in consultation with the BLM, CDFW, USFWS, and State Water Board staff and submitted to the Deputy Director for review and consideration of approval within the timeline designated by the Deputy Director. The proposed updates to the Recreation Plan shall include supporting documentation, and any comments made as part of consultation with information on how such comments were considered.

Licensee shall file the Deputy Director-approved Recreation Plan, and any required changes or amendments thereto, with FERC. Licensee shall implement the Recreation Plan and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

CONDITION 17. Road Management

No later than two years following license(s) issuance, Licensee shall file a Road Management Plan with the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. The Road Management Plan shall be developed in consultation with Central Valley Regional Water Board and State Water Board staff. The Road Management Plan shall describe the maintenance and construction of the Merced Projects' roads in a manner that is protective of water quality. At a minimum, the Road Management Plan shall include:

- An inventory and map of all roads associated with the Merced Projects, including locations of drainage structures, streams, and surface waterbodies;
- An assessment of the Merced Projects' roads to determine if any drainage structures or road segments are impacting or have the potential to impact water quality;
- Proposed measures and an implementation schedule to rehabilitate existing damage and minimize erosion from the Merced Projects' roads;
- Proposed measures designed to improve drainage that are consistent with the most current BLM or Caltrans guidance;
- A process for Licensee to propose updates or modifications to the plan for activities unknown at the time of plan approval, such as new road construction or decommissioning;

- A schedule and plan for inspection, maintenance, and reporting on the Merced Projects' roads throughout the term of the license(s) and any extensions. Reports shall summarize actions taken since the last report was submitted, actions proposed in advance of the next report, and identification of road-related items that may impact water quality or beneficial uses and Licensee's plans to address the items. The Deputy Director may require Licensee to take additional actions to address road-related items with the potential to impact water quality; and
- Documentation of consultation with Central Valley Regional Water Board and State Water Board staff, including comments and recommendations made in connection with the plan, and a description of how the plan incorporates or addresses the comments and recommendations.

Licensee shall file with FERC the Deputy Director-approved Road Management Plan, and any approved amendments thereto. Licensee shall implement the Road Management Plan and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

CONDITION 18. Biological Monitoring and Management

No later than one year following license(s) issuance, Licensee shall submit a Biological Monitoring and Management Plan to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. Licensee shall develop the Biological Monitoring and Management Plan in consultation with the Merced River Anadromous Fish Committee, Merced River Watershed Group, and the Lower San Joaquin River Watershed Group (Condition 6). At a minimum, the Biological Monitoring and Management Plan shall include:

- Monitoring for native resident and migratory fish, benthic macroinvertebrates (BMI), and amphibians in the Lower Merced River (i.e., Crocker-Huffman diversion dam to the confluence with the LSJR) over the term of the license(s) and any extensions. Monitoring shall extend upstream of Crocker-Huffman diversion dam to the extent of anadromous fish passage during the term of the license(s);
- Specific years that monitoring will occur throughout the term of the license(s) and any extensions;
- Standardized sampling and data protocols with that will be implemented with consideration given to methods used for downstream monitoring associated with the Sacramento-San Joaquin Delta;
- Fish data monitoring protocols and frequency that will support assessment of the fisheries with respect to State Water Board approved biological goals for the LSJR and fishery performance metrics (e.g., total abundance, density, age composition, spatial distribution, and seasonal survival). Additionally, fish community composition monitoring and assessment to identify fish species in multiple locations spanning the Lower Merced River in coordination with habitat improvement actions such as gravel augmentation (Condition 11), riparian and

floodplain improvement (Condition 12), and predator suppression (Condition 13). Specifics related to this item include:

- Determine presence or absence of introduced predators, spatial and temporal distribution, diversity, and habitat use;
- Otolith and scale analysis, spawner surveys, and stock-recruitment modeling to evaluate pulse flow effectiveness and track life-history diversity properties of brood years, and population dynamics;
- Snorkel surveys for Central Valley steelhead and scale preservation for Chinook and *O. mykiss*;
- Development and implementation of an acoustic tagging protocol and monitoring design for native migratory fish species and other fish species;
- Annual installation and operation of:
 - Two rotary screw trap monitoring locations in the Merced River with one upstream of the Cressy gage station (CRS)²⁸ and one downstream of Hagaman State Park, to evaluate juvenile survival of Chinook salmon and Central Valley steelhead and identify other fish species that are sampled for information regarding fish community composition;
 - An adult fish counting facility in the Merced River downstream of Hagaman State Park, to evaluate the timing and number of adult salmon and steelhead entering the Merced River; and
 - Identification of habitat protection measures for native fisheries;
- BMI monitoring using the Surface Water Ambient Monitoring Program Protocols²⁹ or its successor program, or an alternative methodology approved by the Deputy Director. The protocols shall include population heterogeneity, composition, and trends;
- Monitoring and habitat protection measures for fish, amphibian, and reptile species that are listed as threatened or endangered under the California Endangered Species Act (ESA) and/or federal ESA, or Species of Special Concern designated by CDFW. These species include, but are not limited to: Central Valley steelhead, Central Valley spring-run Chinook salmon, Central Valley fall and late fall-run Chinook salmon, North American green sturgeon, Western Pond Turtle, Limestone Salamander, California Red-legged Frog, Foothill Yellow-legged Frog, and California Tiger Salamander. (Note monitoring for fish may be covered by other portions of the plan.);
- Monitoring and habitat protection measures for Bald Eagle, including focused surveys to identify eagle nests within one mile of disturbance areas related to the Merced Projects. The early nesting season survey shall occur at a time when eagles are most likely to be found at the nest sites, and the second survey shall occur later in the season and prior to the fledglings leaving the nest to confirm nesting activity. All observations shall be reported to CDFW using the California Bald Eagle Nesting Territory Survey Form or successive reporting process;

²⁸ If this gage location is no longer available, an alternate gage location at or downstream of this location may be used if approved by the Deputy Director.

²⁹ State Water Board. 2022. *Surface Water Ambient Monitoring Program: Quality Assurance Program Plan*. January 2022, and any amendments thereto.

- Monitoring and habitat protection measures for Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp;
- Adaptive management that describes how Licensee plans to adjust monitoring methods based on evaluation of information and monitoring resulting from implementation of the plan;
- Consideration of the Merced Projects' impacts on species and their habitats; and
- Documentation of consultation, including comments and recommendations made in connection with the plan, and a description of how the plan incorporates or addresses the comments and recommendations.

Licensee shall file with FERC the Deputy Director-approved Biological Monitoring and Management Plan, and any approved amendments thereto. Licensee shall implement the Biological Monitoring and Management Plan and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

CONDITION 19. Monitoring, Assessment, Reporting, and Special Studies

19.A Monitoring, Assessment, and Special Studies Program

No later than two years following license(s) issuance, Licensee shall submit a comprehensive Merced River monitoring, assessment, reporting, and special studies plan (Merced River Monitoring Plan) to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval. The Deputy Director also may direct Licensee to implement measures to address impacts to biological resources associated with the Merced Projects. The Merced River Monitoring Plan and performance of the required monitoring may serve as the Merced River portion of the San Joaquin River Monitoring and Evaluation Program (SJRMEP), which is an element of the 2018 Bay-Delta Plan.

Development of the Merced River Monitoring Plan shall build on the monitoring and assessment framework and principles outlined in the California Wetland and Riparian Area Monitoring Plan³⁰ (WRAMP) and the United States Environmental Protection Agency (USEPA) tiered monitoring approach.³¹ The Merced River Monitoring Plan shall describe all monitoring actions required in the conditions of this certification that include monitoring necessary to assess compliance with the flow, water quality, and biological monitoring requirements in this certification, inform adaptive management decisions,

³⁰ WRAMP is designed to support monitoring and assessment of wetlands and streams, including projects, in a watershed or landscape context. Additional information is available on the Elements of WRAMP webpage, which is available online at https://mywaterquality.ca.gov/monitoring_council/wetland_workgroup/wramp/ (Last accessed: November 14, 2024)

³¹ <https://www.epa.gov/wetlands/wetlands-monitoring-and-assessment> (Last accessed: November 14, 2024)

and assess progress toward meeting biological goals.³² The Merced River Monitoring Plan shall be developed in consultation with the agencies in the Merced Watershed Group and the Lower San Joaquin River Watershed Group (Condition 6).

Development and implementation of the Merced River Monitoring Plan shall be integrated and coordinated with monitoring programs in the LSJR watershed and Bay-Delta including, but not limited to: CDFW fish monitoring efforts; the Interagency Ecological Program; Reclamation monitoring for the CVP; DWR monitoring for the SWP; USFWS Anadromous Fish Restoration Program; FERC licensing proceedings and/or new license(s) for FERC projects on the Tuolumne River; San Joaquin River Restoration Program; and regional monitoring programs, such as the Irrigated Lands Regulatory Program East San Joaquin Water Quality Coalition, Delta Regional Monitoring Program, and San Francisco Bay Regional Monitoring Program.

At a minimum, the Merced River Monitoring Plan shall include³³:

- The purpose of the plan and specific management questions the monitoring program is designed to address;
- Compliance Monitoring. Identify the locations and instruments to measure flow and water quality properties (e.g., dissolved oxygen and temperature) needed to demonstrate compliance with flow and water quality requirements in this certification. Identify all monitoring requirements in the conditions of this certification and include them in the plan. See additional details in Condition 1.E for flow compliance monitoring, Condition 8.A for water temperature monitoring, Condition 8.B for dissolved oxygen monitoring, Condition 8.C for mercury monitoring, and Condition 8.D for other constituents monitoring;
- Biological (Effectiveness) Monitoring. Identify fish, BMI, and amphibian monitoring Licensee will conduct in the Merced Projects-affected reaches over the term of the license(s) and any extensions (see additional details in Condition 18);
- Non-Flow Actions. Incorporate compliance and adaptive management monitoring associated with non-flow restoration actions such as gravel augmentation (Condition 11), floodplain restoration (Condition 12), channel margin restoration, large-woody material management (Condition 9), predator suppression (Condition 13), and other non-flow restoration actions as they are implemented.

³² The Bay-Delta Plan requires the development of biological goals for the LSJR tributaries to assess progress towards achieving the narrative LSJR flow objective. The State Water Board approved the Final Initial Biological Goals for the lower San Joaquin River on February 6, 2024 in adopting State Water Board Resolution No. 2024-0006. Available online at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/2024/20240206-final-initial-biological-goals-reso.pdf. (Accessed: January 23, 2025)

³³ To the extent information is provided in another plan required by this certification that has been approved by the Deputy Director, Licensee shall integrate the plan into the Merced River Monitoring Plan. References to certification conditions have been provided to assist Licensee in determining when such instances may occur.

Monitoring designs for non-flow actions shall be based on principles outlined in the WRAMP and the USEPA tiered monitoring approach, or updated approaches approved by the Deputy Director;

- **Assessment.** Identify a schedule for assessing monitoring data and providing data and assessments to the Merced River Watershed Group to inform real-time adaptive management decisions and to complete reporting requirements in Condition 19.B and Condition 19.C. Assessment of monitoring data shall provide: the compliance status for flow and water quality objectives required in this certification; evaluation of biological and ecological monitoring data, and tracking progress toward achieving biological goals; and updated responses to management questions. Assessments shall include identification of any impacts to biological resources and recommendations to address such impacts;
- **Special Studies.** Identify scientific investigations that need to be completed to achieve more effective and efficient attainment of flow and water quality requirements and biological goals; and
- **Governance and Administration.** The Merced River Monitoring Plan shall also include:
 - A governance charter for decision making processes in consultation with the Merced River Watershed Group (Condition 6);
 - Identification of organizations involved in collecting, assessing, and reporting monitoring data and their roles. Licensee shall document consultation with entities identified in monitoring, such as the Merced River Watershed Group (Condition 6);
 - **Data Management.** Identify protocols for collecting, storing, assessing, summarizing, and making monitoring data and assessments and results from special studies available to the public;
 - **Annual Review.** Identify an annual review cycle to determine the need for modifications and a process for proposing modifications to the plan once approved;
 - **External Review.** Identify and implement a schedule for regularly occurring external reviews (e.g., every five years) of the plan and its implementation; and
 - **Long-term funding strategy.** Identify funding sources and allocate resources to monitoring, data management, assessment, reporting, special studies, and external reviews.

Documentation of consultation with the Merced River Watershed Group and Lower San Joaquin River Watershed Group (Condition 6) and existing monitoring programs shall be provided to the Deputy Director as part of the request for review and consideration for approval of the Merced River Monitoring Plan. Documentation shall include any comments and recommendations made in connection with the plan, and a description of how the plan incorporates or addresses the comments and recommendations.

There may be a need to modify the approved Merced River Monitoring Plan to accommodate changing circumstances such as technological improvements in monitoring equipment and the initiation and completion of non-flow restoration actions

or special studies. Proposed modifications shall be based on knowledge gained through monitoring data, assessment results, or results of special studies. Proposed modifications shall be developed through the annual review process in consultation with the Merced River Watershed Group (Condition 6). Licensee shall submit any proposed modifications to the Merced River Monitoring Plan to the Deputy Director for review and consideration for approval. The Deputy Director may require changes as part of any approval.

Licensee shall file with FERC the Deputy Director-approved Merced River Monitoring Plan, and any approved amendments thereto. Licensee shall implement the Merced River Monitoring Plan and any approved amendments thereto upon receipt of approval of the Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

19.B Annual Summary Reports

By December 31 of each year, Licensee shall submit an annual summary report to the Deputy Director that summarizes Licensee's operations and other activities for the prior water year. The annual summary report shall be used to inform future years' operations and other activities. The annual summary report shall describe implementation of flows, including any flow shifting done pursuant to the annual adaptive operations plan or a voluntary agreement, monitoring and special studies activities, and implementation of other measures to protect fish and wildlife during the previous water year, including actions performed by other entities identified in the Bay-Delta Plan's program of implementation. The annual summary report shall also identify any deviations from the annual adaptive operations plan and describe future special studies planned for the water year. Licensee shall ensure that the annual report is available for review and discussion at the Annual Review Meeting (Condition 7).

19.C Comprehensive Reports

Every five years following issuance of the new FERC license(s) for the Merced Projects Licensee shall prepare and submit a comprehensive report to the State Water Board. The comprehensive report shall be prepared to review progress toward meeting the biological goals in the Bay-Delta Plan (State Water Board 2018b) and identify any recommended changes to the implementation of the LSJR flow objectives.

The comprehensive report and any recommendations shall be peer-reviewed by an appropriate independent science panel, which will make its own conclusions and recommendations. In order to leverage expertise and limited resources (financial and otherwise), Licensee is encouraged to work collaboratively in one or more groups and in consultation with the Merced River Watershed Group and the Lower San Joaquin River Watershed Group (Condition 6).

CONDITION 20. Construction and Maintenance

When applicable, Licensee shall comply with the State Water Board's *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit), and amendments thereto. For any construction and maintenance activities with the potential to impact water quality or beneficial uses that are not subject to the Construction General Permit or otherwise covered by another condition of the certification (e.g., recreation facilities may be covered by Condition 16), Licensee shall prepare and implement site-specific Water Quality Monitoring and Protection Plans (WQMP Plans) for Deputy Director review and consideration of approval. WQMP Plans must demonstrate compliance with sediment, turbidity, and other applicable (pH, dissolved oxygen, visible pollutants) water quality objectives in the SR/SJR Basin Plan and the Bay-Delta Plan.

Licensee shall submit the WQMP Plans to the Deputy Director for review and consideration for approval at least 60 days prior to the desired start date of the applicable construction or maintenance activity. The Deputy Director may require changes as part of any approval. The objective of the WQMP Plans shall be to identify and implement control measures for construction, maintenance, or other activities with the potential to cause erosion, stream sedimentation, fugitive dust, soil mass movement, release of hazardous materials, or other water quality impairment.

The WQMP Plans shall be based on actual site geologic, soil, and groundwater conditions, and at a minimum shall include:

- Description of site conditions and the proposed activity;
- Detailed descriptions, design drawings, and specific topographic locations of all control measures in relation to the proposed activity, which may include:
 - Measures to divert runoff away from disturbed land surfaces;
 - Measures to collect and filter runoff from disturbed land surfaces; and
 - Measures to dissipate energy and prevent erosion;
- Measures that will be implemented to protect water quality and beneficial uses;
- Revegetation measures for disturbed areas, which shall include use of native plants and locally sourced plants and seeds; and
- A monitoring, maintenance, and reporting schedule.

Licensee shall file with FERC the Deputy Director approved WQMP Plan(s), and any approved amendments thereto. Licensee shall implement the WQMP Plans and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

CONDITION 21. Reintroduction of Anadromous Fish

Introduction of anadromous fish may require reevaluation of the Merced Projects' facilities, flow regimes, fish stocking plans, availability of large woody material, gravel augmentation, tribal cultural resources, and access to the Merced Projects-affected tributaries.

The Deputy Director may require Licensee to develop and conduct studies, and provide associated reports, if it is reasonably foreseeable anadromous fish species will be introduced into Project-affected streams. Such studies shall be designed in consultation with USFWS, NMFS, CDFW, and State Water Board staff, to develop fish passage, flows, or other measures, as well as determine appropriate modifications to the certification to minimize potential impacts and protect water quality and beneficial uses. For this condition, “reasonably foreseeable” includes, but is not limited to, a comprehensive reintroduction effort or plan that is identified following issuance of this certification and that has a reasonable likelihood of implementation. Any studies and reports shall be reviewed and approved by the Deputy Director prior to implementation. The Deputy Director may require changes as part of any approval.

If it is reasonably foreseeable that listed anadromous fish species will be reintroduced into the Merced Projects-affected streams, the Deputy Director may also require Merced ID to develop and submit a plan for Deputy Director review and approval to ensure adequate protection of SR/SJR Basin Plan objectives and beneficial uses applicable to the anadromous fish species. In developing the plan, Merced ID shall at a minimum consult with the Merced River Anadromous Fish Committee. The plan shall evaluate the need for changes to the conditions of this certification, including at a minimum conditions related to flows (Condition 1), water quality and biological monitoring (Conditions 8 and 18), gravel augmentation (Condition 11), riparian and floodplain improvements (Condition 12), and predator suppression (Condition 13). Merced ID shall provide the plan to the Deputy Director on the timeline identified in the request and provide any comments and recommendations as part of consultation along with how such comments and recommendations were considered. The Deputy Director may require changes as part of any approval.

Licensee shall file with FERC the Deputy Director approved studies, reports, and plan, and any approved amendments thereto. Licensee shall implement the plan and any amendments thereto upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

CONDITIONS 22 – 45

CONDITION 22. Unless otherwise specified in this certification or at the request of the Deputy Director, data and/or reports shall be submitted electronically in a format accepted by the State Water Board to facilitate the incorporation of this information into public reports and the State Water Board's water quality database systems in compliance with Water Code section 13167.

CONDITION 23. This certification does not authorize any act which results in the taking of a threatened, endangered, or candidate species or any act which is now prohibited, or becomes prohibited in the future, under either the California ESA (Fish & Game Code §§ 2050 – 2097) or the federal ESA (16 U.S.C. §§ 1531 – 1544). If a “take” will result from any act authorized under this certification or water rights held by Licensee, Licensee must obtain authorization for the take prior to any construction or operation of the portion of the Merced Projects that may result in a take. Licensee is responsible for

meeting all requirements of the applicable ESAs for the Merced Projects authorized under this certification.

CONDITION 24. This certification shall not be construed as replacement or substitution for any necessary federal, state, and local approvals. Licensee is responsible for compliance with all applicable federal, state, or local laws or ordinances and shall obtain authorization from applicable regulatory agencies prior to the commencement of Merced Projects activities.

CONDITION 25. Any requirement in this certification that refers to an agency whose authorities and responsibilities are transferred to or subsumed by another local, state or federal agency, will apply equally to the successor agency.

CONDITION 26. Nothing in this certification shall be construed as State Water Board approval of the validity of any water rights, including pre-1914 claims. The State Water Board has separate authority under the Water Code to investigate and take enforcement action, if necessary, to prevent any unauthorized or threatened unauthorized diversions of water.

CONDITION 27. This certification is subject to modification or revocation upon administrative or judicial review, including but not limited to review and amendment pursuant to Water Code section 13330 and California Code of Regulations, title 23, division 3, chapter 28, article 6 (commencing with section 3867).

CONDITION 28. This certification is not intended and shall not be construed to apply to any activity involving a hydroelectric facility and requiring a FERC license or an amendment to a FERC license unless the pertinent application for certification was filed pursuant to California Code of Regulations, title 23, section 3855, subdivision (b) and that application for certification specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

CONDITION 29. This certification is conditioned upon total payment of any fee required under California Code of Regulations, title 23, division 3, chapter 28.

CONDITION 30. Notwithstanding any specific provision of this certification, any plan or report developed as a condition of this certification requires review and approval by the Deputy Director, unless otherwise specified. The State Water Board's approval authority, including authority delegated to the Deputy Director or others, includes the authority to withhold approval or modify a proposal, plan, or report prior to approval. The State Water Board may take enforcement action if Licensee fails to provide or implement a required item in a timely manner. Notwithstanding any other condition of this Certification, if a time extension is needed to submit an item for Deputy Director or Executive Director approval, Licensee shall submit a written request for the extension, with justification, to the Deputy Director or Executive Director no later than 60 days prior to the deadline. Licensee shall file with FERC any Deputy Director or Executive Director-approved time extensions. Licensee shall not implement any plan, proposal, or

report until after receiving the applicable State Water Board approval and any other necessary regulatory approvals.

CONDITION 31. In the event of any violation or threatened violation of the conditions of this certification, including if monitoring results indicate that Merced Projects activities could violate water quality objectives or impair beneficial uses, the violation or threatened violation is subject to any remedies, penalties, process, or sanctions as provided for under applicable state or federal law. For the purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance with the water quality standards and other pertinent requirements incorporated into this certification. In response to any violation or threatened violation of the conditions of this certification, Licensee shall, by a deadline required by the Deputy Director, submit a plan that documents why the violation occurred and steps Licensee will implement to address the violation. Licensee shall implement the plan upon approval from the Deputy Director, and the Deputy Director may require changes as part of any approval.

CONDITION 32. Licensee shall submit any change to the Merced Projects, including operations, facilities, technology changes or upgrades, or methodology, which may have a significant or material effect on the findings, conclusions, or conditions of this certification, to the State Water Board for prior review and written approval. The State Water Board shall determine significance and may require consultation with state and/or federal agencies. If the State Water Board is not notified of a change to the Merced Projects, it will be considered a violation of this certification. If such a change would also require submission to FERC, the change must first be submitted and approved by the Executive Director of the State Water Board unless otherwise delegated in this certification or other State Water Board approval.

CONDITION 33. This certification is contingent on compliance with all applicable requirements of the Central Valley Regional Water Board's SR/SJR Basin Plan (Central Valley Regional Board, 2019) and any amendments thereto, and the State Water Board's Bay-Delta Plan (State Water Board, 2018b) and any amendments thereto.

CONDITION 34. Unless otherwise specified by conditions in this certification, the Merced Projects shall be operated in a manner consistent with all water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act.

CONDITION 35. In addition to the specific conditions in this certification, the Merced Projects shall be operated in a manner consistent with all applicable requirements of the Bay-Delta Plan and SR/SJR Basin Plan and any amendments to these plans.

CONDITION 36. In response to a suspected violation of any condition of this certification, the State Water Board or Central Valley Regional Water Board may require the holder of any federal permit or license subject to this certification to furnish, under penalty of perjury, any technical or monitoring reports the State Water Board deems

appropriate, provided that the burden, including costs, of the reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. (Wat. Code, §§ 1051, 13165, 13267, and 13383.)

CONDITION 37. Future changes in climate projected to occur during the term of the Merced Projects FERC license(s) may alter the baseline assumptions used to develop the conditions of this certification and necessitate adaptive management. Reports and plans submitted by Licensee for approval under this certification shall consider the effects of climate change on Merced Projects operations and, as necessary, propose updates to Merced Projects operations to ensure protection of water quality and beneficial uses and compliance with other appropriate requirements of state law. The Deputy Director may identify the need for, and set a deadline for, submittal of a report and plan focused on additional assessment of potential impacts to water quality and beneficial uses that may have changed from the baseline assumptions used to develop the conditions of the certification, along with recommended changes to address the changed climate conditions and ensure water quality and beneficial use protections. The Deputy Director may include recommendations regarding potential actions that shall be considered by Licensee in this report and plan to ensure ongoing protection of water quality and beneficial uses and compliance with appropriate requirements of state law. The Licensee shall implement the plan upon approval from the Deputy Director and any other required approvals, and the Deputy Director may require changes as part of any approval.

CONDITION 38. The State Water Board shall provide notice and an opportunity to be heard in exercising its authority to add to or modify the conditions of this certification.

CONDITION 39. Upon request, a construction schedule shall be provided to the Deputy Director. Licensee shall provide State Water Board and Central Valley Regional Water Board staff access to the Merced Projects sites to document compliance with this certification.

CONDITION 40. A copy of this certification shall be provided to any contractor and all subcontractors conducting Merced Projects-related work, and copies shall remain in their possession at the Merced Projects site(s). Licensee shall be responsible for work conducted by its contractor, subcontractors, or other persons conducting work related to the Merced Projects.

CONDITION 41. Licensee shall use analytical methods approved by California's Environmental Laboratory Accreditation Program, where such methods are available. Samples that require laboratory analysis shall be analyzed by Environmental Lab Accreditation Program-certified laboratories.

CONDITION 42. Licensee shall ensure no net loss of wetland or riparian habitat functions and is responsible for compliance with the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Water Board 2019 and 2021) and the and Water Code Division 7, Chapter 28, sections 16200-16201.

CONDITION 43. Activities associated with operation and maintenance of the Merced Projects that threaten or potentially threaten water quality shall be subject to further review by the Deputy Director and Executive Officer of the Central Valley Regional Water Board. Any proposal for the Merced Projects maintenance or repair work involving the Merced Projects-affected waterbodies, including desilting of dam impoundments, impoundment drawdowns to facilitate repair or maintenance work, and tailrace dredging, shall be filed with the Deputy Director for prior review and consideration for approval. The Deputy Director may require changes as part of any approval.

CONDITION 44. This certification is subject to modification to incorporate feasible measures to avoid or reduce significant environmental impacts or to make any necessary findings based on any environmental documents certified by the California Environmental Quality Act (CEQA) lead agency after this certification is issued, including any revisions to those environmental documents made as a result of judicial review of the CEQA lead agency's approval of the Merced Projects.

CONDITION 45. Certification that the project will be protective of water quality and beneficial uses in compliance with state and federal water quality standards and other appropriate requirements of state law is dependent upon the conditions and limitations imposed by this certification, however, to ensure the validity of this certification upon any challenge that is not addressed by another condition of this certification, the provisions of this certification are severable. If any provision of this certification is found invalid, affects the validity of the certification, or would result in a determination that the State Water Board has waived its section 401 certification authority for the Merced Projects, the remainder of this certification shall not be affected. Upon remand from determination on administrative or judicial review that a provision of this certification is invalid or affects the validity of the certification, the State Water Board may adopt an alternative term that addresses the water quality issue while avoiding the invalidity.

DRAFT

Eric Oppenheimer
Executive Director

Date

Enclosures: Appendix A: Merced Projects Description
Appendix B: Consolidated Instream Flow Requirements (*provided for convenience and illustrative purposes*)

9.0 References

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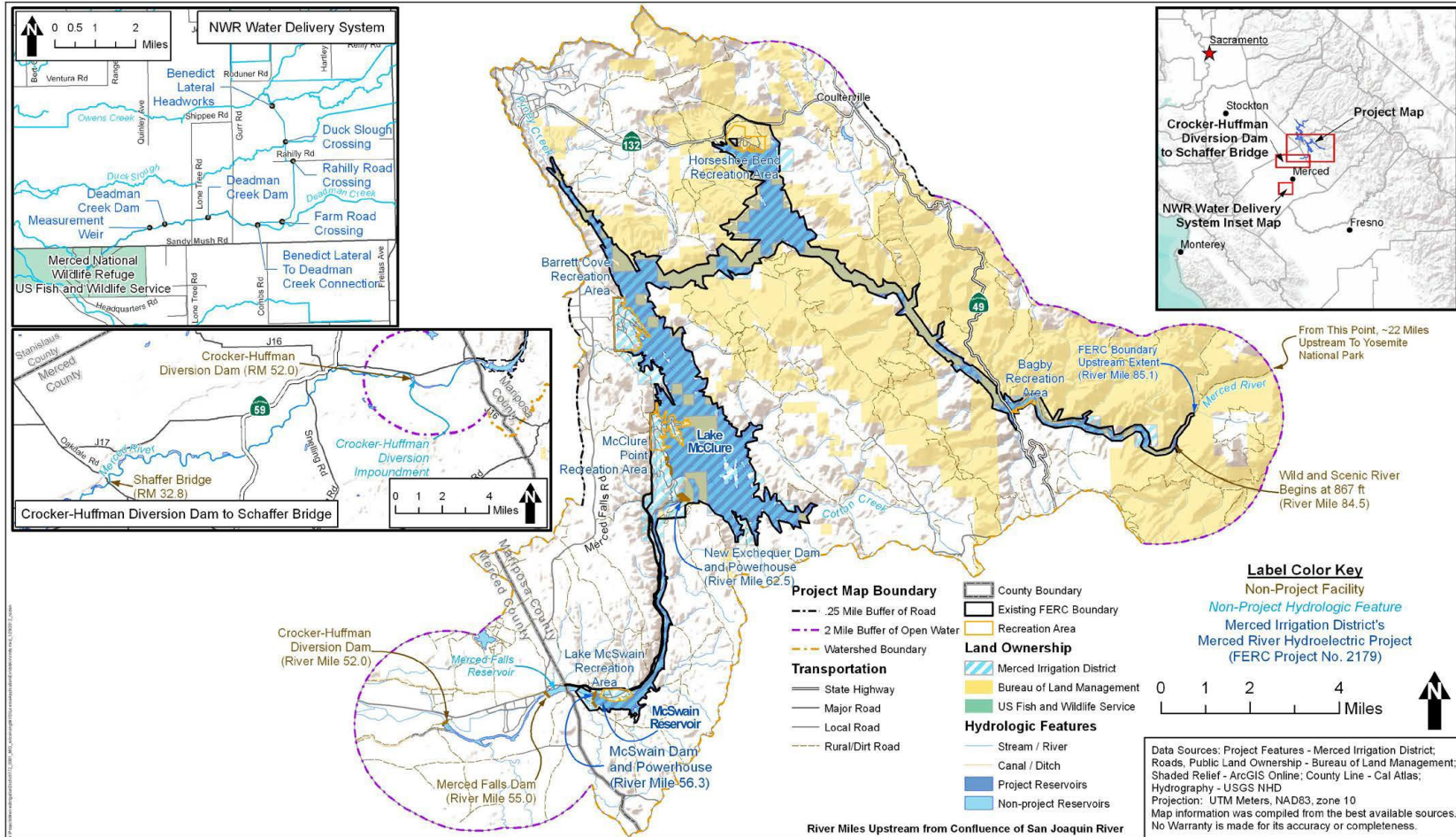


Figure 1. Merced River and Merced Falls Hydroelectric Projects Location Map (source FLA 2012)

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**DRAFT WATER QUALITY CERTIFICATION
FOR
MERCED RIVER HYDROELECTRIC PROJECT
AND
MERCED FALLS HYDROELCTRIC PROJECT**

APPENDIX A: PROJECTS DESCRIPTION

JANUARY 2025

1.0 Description of Projects

The Merced River Hydroelectric Project and Merced Falls Hydroelectric Project (collectively Merced Projects), Federal Energy Regulatory Commission (FERC) Project Nos. 2179 and 2467, respectively, are located in the Merced River watershed, in Merced and Mariposa counties, California (see draft water quality certification Figure 1). The Merced Projects are owned and operated by Merced Irrigation District (Merced ID).

The majority of the Merced Projects' facilities are located on federal land administered by the United States Department of Interior, Bureau of Land Management (BLM) as part of the Sierra Resource Management Area. The major components of the Merced Projects include two reservoirs, one impoundment, three powerhouses, and various access roads and other appurtenant facilities. The Merced River Hydroelectric Project (Merced River Project) has an authorized installed capacity of 101.25 megawatts and the Merced Falls Hydroelectric Project (Merced Falls Project) has an authorized installed capacity of 3.4 megawatts.

1.1 Facilities

1.1.1 Merced River Project

The Merced River Project includes two main developments: New Exchequer and McSwain.

1.1.1.1 New Exchequer Development

The New Exchequer development is the upstream facility and consists of: (1) New Exchequer dam—a 490-foot-high and 1,220-foot-long rock structure with a reinforced concrete upstream face that impounds Lake McClure; (2) an ogee-type, concrete spillway with a 1,080-foot-long, ungated section and a 240-foot-long, gated section with six radial gates that are 40-foot-wide and 30-foot-high; (3) an earth-and-rock dike that is 62-foot-high and 1,500-foot-long; (4) an intake structure located upstream of the dam in Lake McClure; (5) a concrete-lined power tunnel that is 383-foot-long and 18-foot-in-diameter; (6) a concrete-encased, steel penstock that is 982-foot-long and 16-foot-in-diameter; (7) an above-ground concrete powerhouse that is 75-foot by 91-foot and discharges directly to the Merced River; (8) a low-level outlet, consisting of a 945.5-foot long, 108-inch-diameter powerhouse bypass (a steel pipe) that runs from the New Exchequer power tunnel to McSwain reservoir north of the New Exchequer powerhouse with a 108-inch-diameter Howell-Bunger valve; and (9) an interconnection to the grid at the step-up transformer in the powerhouse switchyard. The development is located on Merced ID (7,577.5 acres), BLM (3,134.7 acres), and private (13.2 acres) land.

Merced ID maintains four recreation areas at Lake McClure: (1) McClure Point, which includes a campground, picnic area, swim beach, marina, and boat ramp; (2) Barrett Cove, which includes a campground, swim beach, marina with two boat ramps, and overflow parking; (3) Horseshoe Bend, which includes a campground, swim beach, and boat ramp; and (4) Bagby, which includes a campground, boat ramp, and Shepherd's Point primitive area (considered part of the Bagby recreation area).

1.1.1.2 McSwain Development

The McSwain development is the downstream facility, consisting of: (1) McSwain dam—an embankment structure with a central impervious core of rolled fill between shoulders of cobbles or crushed rock—that is 80-foot-high and 1,620-foot-long and impounds McSwain reservoir; (2) an ungated concrete overflow spillway that is 802-foot-long; (3) an intake structure that is integral with the dam; (4) a concrete-lined power tunnel that is 160-foot-long and 15-foot-in-diameter that leads to a steel penstock that is 160-foot-long and 15-foot-in-diameter; (5) an above-ground, concrete powerhouse that is 72-foot by 72-foot and discharges directly into the Merced River; and (6) a low-level outlet, consisting of a 360-foot-long, 9-foot-diameter powerhouse bypass pipe that runs from the McSwain power tunnel to Merced Falls reservoir with a fixed wheel gate at the upstream end of the bypass and an 8-foot-diameter Howell-Bunger valve on its downstream end. There is no transmission line associated with the powerhouse. The development connects to Pacific Gas and Electric Company's (PG&E's) interconnected system at the step-up transformer in the powerhouse switchyard. The development is located on Merced ID (907.5 acres) and BLM (20.2 acres) land.

Merced ID maintains the McSwain recreation area at this development, which includes a campground, picnic area, group picnic area, informal day use area, swim beach, marina, and boat ramp.

1.1.1.3 Crocker-Huffman Diversion Dam

Crocker-Huffman diversion dam is located 4.3 miles downstream of Merced ID's McSwain dam and 3.0 miles downstream of Merced Falls dam. Merced ID owns Crocker-Huffman diversion dam and operates it as part of Merced ID's water delivery system, but the dam is not included as part of the Merced Projects. The concrete gravity dam is approximately 725-foot-long and 22-foot-high and diverts approximately 2,000 cubic feet per second (cfs) of water into Merced ID's Main Canal (irrigation canal).

1.1.1.4 Merced National Wildlife Refuge Water Delivery Facilities

FERC's license requires that Merced ID provide to the United States Fish and Wildlife Service up to 15,000 acre-feet of water and return flow to the Merced National Wildlife Refuge (Merced NWR). The Merced NWR, located about 30 miles southeast of McSwain dam, is part of the San Luis National Wildlife Refuge Complex (see draft water quality certification Figure 1). It encompasses 10,262 acres of wetlands, native grasslands, vernal pools, and riparian areas. The Merced NWR was established in 1951 under the federal Lea Act (16 U.S.C. §695–695c; 62 Stat. 238) to attract wintering waterfowl from adjacent farmland where their foraging was causing crop damage.

To provide this water, in the early 1990s, Merced ID made eight modifications to its existing Benedict lateral canal, which is part of Merced ID's water supply delivery system and composed of non-Merced Projects facilities. These modifications were incorporated into the Merced River Project license (but not included in the FERC project boundary). The eight modifications, from upstream to downstream, include:

- Benedict-lateral headworks;
- Benedict lateral duck slough crossing;

- Benedict lateral Rahilly Road crossing;
- Benedict lateral Farm Road crossing;
- Benedict lateral to Deadman Creek connection;
- Deadman Creek dam and flashboard risers (Station 77+73);
- Deadman Creek dam and flashboard risers (Station 142+00); and
- a measurement weir.

Currently, Merced ID uses various combinations of channels in its irrigation system to deliver water to Merced NWR. The summary of facilities used to deliver water to the Merced NWR is based on Merced ID's September 5, 2014 filing with FERC. Merced ID delivers water to the Merced NWR from Lake Yosemite, an instream regulating reservoir located at the end of Merced ID's Main Canal. The lake receives input from other sources as well. Merced ID has several facilities that divert water from Lake Yosemite for water supply purposes, including the Fairfield Canal and the Le Grand Canal, as well the Tower Lateral, a small lateral canal. Water from Lake Yosemite is conveyed primarily through the Le Grand and Fairfield canal systems to about 70,000 acres of irrigated land, including the Dean and El Capitan canal systems, through Merced ID's vast, interconnected water conveyance system. The Fairfield, Le Grand, Dean, and El Capitan canal systems are Merced ID conveyance systems that, in addition to providing water supply to Merced ID growers, are also used to convey water to Merced NWR. The Dean and El Capitan canal systems are supplied from the Fairfield and Le Grand canal systems via Bear Creek. Crocker dam, which is unrelated to Crocker-Huffman diversion dam, is a manually operated dam in Bear Creek that functions as a diversion dam during the irrigation season. When raised, Crocker dam serves to back up water into the Dean and El Capitan canal systems. The delivery to Merced NWR is located on Deadman Creek, in the northeast quarter of the southeast quarter of Section 36, Township 8S, Range E, the most southerly, downstream stretch of Merced ID's conveyance network. Water can take a variety of different paths through different canals before reaching Merced NWR.

1.1.2 Merced Falls Project

The existing Merced Falls Project consists of: (1) a concrete gravity dam with a structural height of 34 feet and a crest length of 575 feet; (2) three radial gates, each 20-feet-long and 13.5-feet-high; (3) a one-mile-long impoundment with approximately 900 acre-feet of storage capacity, a useable storage capacity of approximately 579 acre-feet, a total surface area of approximately 65 acres, and a normal impoundment elevation of 344 feet above mean sea level; (4) powerhouse facilities consisting of a steel building housing a 3.4-megawatt turbine/generator unit and a vertical Kaplan-type four-blade turbine; (5) a 1,000-foot-long earthen levee with a crest width of eight feet; (6) an adjacent intake structure with a debris rack; and (7) a non-operable fish ladder.

The Merced Falls Project has a dependable capacity of 1.7 megawatts and an annual average generation of approximately 14.4 gigawatt hours.

1.2 Current Operations

The Merced River Project and the Merced Falls Project currently operate under annual licenses since their FERC licenses (issued on April 8, 1964, and on July 28, 1969, respectively) expired in 2014.

1.2.1 Merced River Project

Merced ID operates Lake McClure to retain snowmelt from springtime runoff for flood control, water supply, recreation, hydropower, and environmental purposes. During winter storms, the Merced River Project attenuates high flows (i.e., those in excess of about 3,200 cfs that would otherwise pass downstream of the project) and stores this water in Lake McClure. During the drier months of July through November, the Merced River Project augments flows between Crocker-Huffman diversion dam and Shaffer Bride on the Merced River compared to those that would occur without the Merced River Project. In spring and summer, water levels are maintained relatively high for recreation at Lake McClure. From March through October, Merced ID releases water primarily for downstream water supply. These releases are also used for hydropower generation at New Exchequer and McSwain powerhouses. The normal maximum and minimum reservoir elevations for Lake McClure are 867 feet and 630 feet, but, typically, the reservoir is operated within a range of 842 feet to 780 feet.

In September and October, Merced ID releases water from storage when necessary to achieve a level of storage that allows for the required flood space, and storage is maintained at or below this level through mid-March. In the spring, depending on the snowpack and runoff forecasts, Merced ID begins to refill Lake McClure with the snowmelt runoff. During drier years and drier periods, water levels may consistently stay below the required flood-space level because water supply and recreation needs drive reservoir storage more than flood control requirements.

McSwain reservoir is typically operated as a re-regulating afterbay for flows released from Lake McClure. This operation allows the New Exchequer powerhouse to be used to meet peak power demands or perform load-following functions while still maintaining a steady flow release to the Lower Merced River. The normal maximum and minimum reservoir elevations for McSwain reservoir are 399.0 feet and 391.5 feet. Water surface elevations below the normal minimum reservoir elevation do occur, but they are generally due to atypical operating conditions, such as unplanned outages, inspections, or work on the dam.

Merced ID operates New Exchequer and McSwain powerhouses as base-load plants with seasonal peaking capabilities; these peaking capabilities are primarily exercised at New Exchequer powerhouse. McSwain powerhouse is operated to re-regulate flows released by New Exchequer powerhouse by providing flows that are more reflective of inflows to Lake McClure with releases dependent on the requirements for downstream water supply at, and downstream of, Crocker-Huffman diversion dam. Both powerhouses are operated on-site by Merced ID from a centralized control center at New Exchequer dam and powerhouse and have automatic generation control capability. The New Exchequer development diverts all flows from Lake McClure through the

intake, power tunnel, penstock, and powerhouse and then directly releases the flows to McSwain reservoir. The McSwain development diverts all flows from McSwain reservoir through the intake, power tunnel, penstock, and powerhouse and then directly to Merced Falls reservoir on the Merced River.

1.2.2 Merced Falls

The Merced Falls Project is operated in a run-of-river mode dependent on water outflow from Merced ID's upstream Merced River Project. Inflow to the Merced Falls Project passes through the impoundment, which is kept at a constant water elevation and then flows either through the powerhouse or the dam's radial gates. Flows of up to approximately 1,750 cfs are diverted through the powerhouse, and then discharged to the Merced River via the tailrace. When water inflows exceed 2,200 cfs, the Merced Falls Project spills water through the radial gates. The main section of the dam, approximately 535.5-feet-long, is topped with needle beams. During flood events with flows greater than 12,250 cfs, the needle beams can be dropped, allowing the 575-foot-long concrete section of the dam to act as a spillway.

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**WATER QUALITY CERTIFICATION
FOR
MERCED RIVER HYDROELECTRIC PROJECT
AND
MERCED FALLS HYDROELECTRIC PROJECT**

**APPENDIX B:
CONSOLIDATED INSTREAM FLOW REQUIREMENTS
*(provided for convenience and illustrative purposes)***

January 2025

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Consolidated Instream Flow Requirements in Conditions 1.B, 1.C, and 1.D (provided for convenience and illustrative purposes)

Month	Water Year Type	Minimum Instream Flows at Shaffer Bridge (cfs)	Minimum Instream Flows at Stevinson Gage (cfs)	Spring and Fall Pulse Flows (TAF)	Bay-Delta Plan LSJR Flows
January	Wet	220	150		Period during which adaptive methods allow flow shifting, if approved
	Above Normal	220			
	Below Normal	220			
	Dry	180			
	Critical	180			
February	Wet	220			
	Above Normal	220			
	Below Normal	220			
	Dry	180			
	Critical	180			
March 1-15	Wet	220		Spring: Wet – 30 TAF Above Normal = 20 TAF Below Normal = 15 TAF Dry = 10 TAF Critical = 5 TAF	LSJR Feb – June flow objectives When LSJR flow requirements exceed minimum instream base flows, LSJR requirements control and can also be used to meet Conditions 1.B and 1.C
	Above Normal	220			
	Below Normal	220			
	Dry	180			
	Critical	180			
March 16-31	Wet	410		Pulse flows are in addition to base flows The timing, magnitude, and duration of the spring pulse flow releases shall be determined in consultation with the Merced River Watershed Group, Anadromous Fish Committee, and the Lower San Joaquin River Watershed Group.	
	Above Normal	370			
	Below Normal	330			
	Dry	275			
	Critical	200			
April 1-15	Wet	590			
	Above Normal	500			
	Below Normal	450			
	Dry	375			
	Critical	250			
April 16 - 30	Wet	790			
	Above Normal	700			
	Below Normal	600			
	Dry	500			
	Critical	300			
May	Wet	790			
	Above Normal	700			
	Below Normal	600			
	Dry	400			
	Critical	250			
June	Wet	200			
	Above Normal	150			
	Below Normal	150			
	Dry	100			
	Critical	100			
July	Wet	200			
	Above Normal	150			
	Below Normal	150			
	Dry	150			
	Critical	150			
August	Wet	200	66		
	Above Normal	150			
	Below Normal	150			
	Dry	150			
	Critical	150			
September	Wet	200			
	Above Normal	150			
	Below Normal	150			
	Dry	150			
	Critical	150			
October 1 – 15	Wet	200		Fall: 12.5 TAF Pulse flows are in addition to base flows	Period during which adaptive methods allow flow shifting, if approved.
	Above Normal	150			
	Below Normal	150			
	Dry	150			
	Critical	150			
October 16 –31	Wet	175	150	The timing, duration, and rate of the fall pulse flow shall be determined in consultation with the Merced River Anadromous Fish Committee.	
	Above Normal	175			
	Below Normal	150			
	Dry	150			
	Critical	150			
November	Wet	220			
	Above Normal	220			
	Below Normal	220			
	Dry	180			
	Critical	180			
December	Wet	220			
	Above Normal	220			
	Below Normal	220			
	Dry	180			
	Critical	180			

Abbreviations: cfs – cubic feet per second; LSJR – Lower San Joaquin River; TAF – thousand acre-feet.