Eileen Sobeck
Executive Director
California State Water Resources Control Board
P. O. Box 100
Sacramento CA, 95812-0100

Subject: California 2014-2016 CWA Section 303(d) List of Impaired Waters

Dear Ms. Sobeck:

Thank you for submitting California's 2014-2016 Clean Water Act (CWA) 303(d) List of Impaired Waters (2014-16 List). The U. S. Environmental Protection Agency (EPA) received the submittal on February 5, 2018, and has completed review of the listing package.

This letter summarizes the actions the EPA takes today on the 2014-16 List based on CWA section 303(d) and the EPA implementing regulations. The legal requirements and the rationale for the actions are detailed in Enclosure 1.

EPA's action:

EPA approves all water quality limited segments (WQLSs) and associated pollutants identified by the State Water Resources Control Board (State Water Board) as requiring a total maximum daily load under CWA section 303(d). EPA further finds that California has demonstrated good cause for delisting 191 WQLSs based on approved TMDLs.

EPA has previously expressed concerns about the desirability of evaluating certain temperature data developed by the California Department of Fish and Wildlife (CDFW) and the California Department of Water Resources (CDWR). *See* Letter from Janet Hashimoto, EPA, to Joseph Simi, CVRWQCB, November 3, 2016. EPA recognizes that this listing cycle represents a significant shift in the State and Regional Boards' process for soliciting and reviewing relevant data. EPA further recognizes the challenges of working with voluminous continuous monitoring data. At the same time, EPA continues to be concerned about the need to develop a list that reflects the substantially impaired Fish Migration and related beneficial uses in the Central Valley and to include a consideration of the significant temperature data set from CDFW and CDWR.

EPA appreciates the constructive discussions we have had with State Board staff on this issue. We understand, based on the State Board's Letter dated [PROBABLY THURSDAY?], that the State Board is willing to consider reviewing this temperature data "off cycle" so that any possible additional listings could be included in the next review of water quality limited segments (presently scheduled for 2019). We believe that such a consideration is consistent with the Board's listing

policy, which envisions "off cycle" evaluations in the event that there is "high priority data." See Staff Report, (02/03/15, Item 8, page2). To assist the State Board in its consideration of this issue, EPA is enclosing as Enclosure 2 our recent synthesis of the CDFW and CDWR temperature data and our thoughts on how this data reflects on protection of the salmonid beneficial uses.

I value the collaboration between our two agencies and look forward to continuing our partnership to protect California's waters. If you have any questions, please let me know or have your staff contact Janet Hashimoto, Manager of the Water Quality Assessment Section, at (415) 972-3452.

Sincerely,

Tomás Torres
Director, Water Division

Enclosure

cc: Rebecca Fitzgerald, DWQ
Jessie Maxfield

Enclosure 1:

EPA Review of California's 2014-16 CWA Section 303(d) List
Submitted February 5, 2018

Purpose

The purpose of this document is to describe the rationale for the EPA's approval of California's 2014-2016 list of water quality limited segments requiring a Total Maximum Daily Load (TMDL) under Clean Water Act Section 303(d). The following sections identify those key elements to be included in the list submittal based on the Clean Water Act and EPA regulations (see 40 CFR 130. 7). EPA carefully reviewed the State's submittal including the listing decisions, the assessment methodology used by the State in developing its list, and supporting data and information. EPA's review of California's list is based on EPA's analysis of whether the State reasonably considered existing and readily available water quality-related data and information, and reasonably identified waters required to be listed.

This review describes the basis for EPA's decision to approve the State's listings of water quality limited segments requiring a TMDL identified in the State's 2014-2016 Integrated Report, (see "Category 5: 2014 and 2016 California 303(d) List of Water Quality Limited Segments"). The portion of the California Integrated Report which EPA defines as the 303(d) List are the waters and pollutants California identifies as "5A: TMDL still required."

Statutory and Regulatory Background

Identification of WQLSs for Inclusion in the List

CWA Section 303(d)(1) directs each state to identify those waters within its boundaries for which effluent limitations required by Section 301(b)(1)(A) and (B) are not stringent enough to implement any applicable water quality standard (WQS), and to establish a priority ranking for addressing such waters, taking into account the severity of the pollution and the uses to be made of such waters. The 303(d) listing requirements apply to both waters impaired by point sources and waters impaired by nonpoint sources of pollution.

The EPA regulations provide that a state does not need to list WQLSs where the following types of controls are adequate to implement applicable standards: (1) technology-based effluent limitations required by the Clean Water Act, (2) more stringent effluent limitations required by federal, State or local authority, and (3) other pollution control requirements required by State, local, or federal authority. See 40 CFR 130. 7(b)(1).

In developing its list, each state is required to assemble and evaluate all existing and readily available water quality-related data and information, including, at a minimum: (1) waters identified as partially meeting or not meeting designated uses or as threatened in the state's most recent CWA Section 305(b) report; (2) waters for which dilution calculations or predictive modeling indicate

nonattainment of applicable standards; (3) waters for which water quality problems have been reported by governmental agencies, members of the public, or academic institutions; and (4) waters identified as impaired or threatened in any CWA Section 319 nonpoint source assessment submitted to the EPA. See 40 CFR 130. 7(b)(5). The EPA's 2006 assessment and listing guidance describes additional types of water quality-related data and information that should be assembled and evaluated for developing state lists.

Consideration of Existing and Readily Available Water Quality-Related Data and Information

The EPA regulations at 40 CFR 130. 7(b)(6) require each state to include, as part of their submittals to the EPA, documentation to support decisions to rely or not rely on particular data and information, and decisions to list or not list waters. Such documentation needs to include, at a minimum, the following information: (1) a description of the methodology used to develop the list; (2) a description of the data and information used to identify waters; and (3) any other reasonable information requested by the EPA.

Priority Ranking

The EPA regulations at 40 CFR 130. 7(b)(4) require each state to prioritize waters on its list for TMDL development, and to identify those WQLSs targeted for TMDL development in the next two years. In prioritizing and targeting waters, each state must, at a minimum, take into account the severity of the pollution and the uses to be made of such waters. See 303(d)(1)(A). A state may consider other factors relevant to prioritizing waters for TMDL development, including immediate programmatic needs, vulnerability of particular waters as aquatic habitats, recreational, economic, and aesthetic importance of particular waters, degree of public interest and support, and state or national policies and priorities. See 57 FR 33040, 33044-45 (July 24, 1992), and EPA 1991.

Analysis of Submittal from the State of California

Identification of WQLSs

The EPA has reviewed the State's submittals and concludes that the State developed the 2014-16 List in compliance with CWA Section 303(d) and 40 CFR 130. 7. The EPA's review is based on its analysis of whether the State reasonably considered existing and readily available water quality related data and information and reasonably identified waters required to be listed.

California used its 2012 Section 303(d) List and 305(b) Report as its starting point, and based its 2012 Section 303(d) submittal on its analysis of readily available data and information to determine whether additions to or deletions from the 2014-16 List were necessary. California's approach, wherein previously listed waters remain as WQLSs unless the existing and readily available water quality-related data no longer indicate impairment, is consistent with federal requirements. The EPA finds it was reasonable for California to include most of the previously listed waters on the 2014-16 List.

The State also made efforts to clarify the geographic extent of waterbody segments between the 2012 Section 303(d) List and 305(b) Report and the 2014-16 Water Quality Integrated Report.

These clarifications reflect changes in waterbody names, changes in extent of impairment or the splitting of a waterbody into one or more segments. See 2014-16 Water Quality Integrated Report, Appendix J and Miscellaneous Changes Appendix K. The State updated its web map application to display assessment data and results addressed in the 2014-16 Integrated Report[1]. This California 2014-16 Integrated Report Web Map Application was assembled to make publicly available information about the waterbodies and sample locations assessed in the California 2014-16 Integrated Report.

Assembly of Data and Information

The EPA's review found the data compilation process was clear and provided an adequate basis for water body assessments. The State Water Board staff devoted considerable effort to assembling new data and information for the 2014-16 Water Quality Integrated Report and development of the 303(d) list. Staff compiled data and information from multiple sources, including each of the data and information categories identified at 40 CFR 130. 7(b)(5). The State issued public notice soliciting data and information from the public on January 14, 2010, with submittals requested by August 30, 2010.

Additionally, the solicitation notice was emailed to an extensive emailing list, and posted on the State Water Board's website. Overall, the State considered data and information submitted during the comment period including: fish advisories; USEPA databases; existing and readily available water quality data and information reported by local, State and federal agencies, citizen groups, academic institutions and the public; and other sources of data and information that were readily available to staff. EPA finds the State's approach to assembling readily available information to be reasonable. EPA's review found the data compilation process was sufficiently clear and consistent with federal listing requirements, and a sufficient basis for water body assessments.

Listing Methodology

The submittal summarizes the listing methodology used by California to develop the 2014-16 Water Quality Integrated Report and 303(d) list, and specifies explicit factors for making listing and delisting decisions for different pollutant types based on different kinds of data. Data are evaluated using the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy)[2].

California's 2014-16 Water Quality Integrated Report includes a list of water segments where a water quality standard is not met or expected to be met, but an impairment is being addressed by a USEPA approved TMDL. See 2014-16 Water Quality Integrated Report, Appendix B, Approved TMDL List. EPA understands this list to include water segments and pollutant pairs which the State has identified as impaired but is not requiring a new or revised TMDL at this time (Appendix C. Category 4a) and water segments where the implementation of other pollutant control measures is expected to attain water quality (Appendix D. Category 4b).

The EPA reviewed the various assessments and concludes the State's assessments are consistent with federal listing requirements and applicable water quality standards.

[1] www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml
[2] www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/020315_8_amendment_clean_version.pdf

Public Comments

The State Water Board and Regional Boards sought public input at several points in the process of developing the 2014-16 Water Quality Integrated Report including:

- The State Water Board sent a Notice of Public Solicitation of Water Quality Data and Information for the 2012 Integrated Report on January 19, 2010. The deadline for submittal of the data was extended from June 30 to August 30, 2010.
- The Regional Boards for the San Francisco, Central Coast, Los Angeles, Central Valley, Santa Ana and San Diego regions provided advanced notice and opportunity to the public to submit written comments, responded in writing to those written comments, and considered oral testimony in 2016 and 2017.
- The State Water Board solicited public comments on the list on June 9,2017 with comments due by July 10, 2017. The response to comments is posted on the State Board website.
- The State Water Board held a Public Hearing on the list on October 3, 2017.
- The 2014-16 303(d) List was approved by the State Water Board on October 3, 2017 (Resolution No. 2017-0059).

Conclusions

The EPA Finds that California Properly Added 806 New WQLSs to the 2014-2016 List

Based on all the existing and readily available data, California identified 974 WQLSs in Category 5 which are waterbodies with impairment of at least one waterbody of the Integrated Report (Table 1) but only 806 of these WQLSs require a TMDL and are added to the 2014-16 List. Of the 974 WQLSs, 113 WQLSs already have TMDLs in place (see Appendix, Table A1). These 113 WQLSs would normally be in category 4a but California keeps these waterbodies on the impaired waterbodies list as 5b until all impairments are addressed. 55 WQLSs are being addressed by another program (see Appendix Table A2). These would normally be in category 4b, but California keeps these waterbodies on the impaired list as 5c. Of the 55 WQLSs addressed by another program, 30 WQLSs for trash are being addressed by the State's Trash Policy and 24 WQLSs for pesticides are being addressed by actions of the Central Valley Regional Board including Resolution No. R5-2014-0041) and 1 WQLS for nitrate was removed because a State action removed the source of the problem.

The EPA Finds That California Demonstrated Good Cause for Delisting 191 WQLSs Based on Approved TMDLs

California's Staff Report identified 191 WQLSs that were not included on the Section 303(d) List because analysis of available monitoring data supported a conclusion that applicable standards were no longer exceeded. EPA reviewed California's rationale for its decision to delist and not include on its 2014-16 List several waters that were included on its 2012 Section 303(d) List. Of the 191 WQLSs that were removed from the 2014-16 List, 142 of WQLSs were removed due to improved water quality, 48 WQLSs were removed due to TMDL development (4a) and 35 WQLS was removed because a State action removed the source of the problem (4b). The State demonstrated to EPA's satisfaction that these WQLSs do not require TMDLs or TMDLs were

completed. See, 40 CFR 130. 7(b)(6)(iv).

Table 1 Summary of WQLSs added to the 2014-16 Integrated Report.

Pollutant Class	San Francisco RWQCB 2	Central Coast RWQCB 3	Los Angeles RWQCB 4	Central Valley RWQCB 5	Santa Ana RWQCB 8	San Diego RWQCB 9	Pollutant Totals
Pesticides	2	65	36	83	7	32	**225**
Bacteria	10	61	14	27	5	65	**182**
Nutrient-related		54	21	46	1	55	**177**
Toxicity	3	29	13	41	9	15	**110**
Metals	9	14	11	48	1	24	**107**
Benthic Community Effects		5	5		5	28	**43**
Trash			11			19	**30**
Misc.		47	17	28	1	7	**100**
Totals by Regional Board	**24**	**275**	**128**	**273**	**29**	**245**	**974**

Table 2. Summary of WQLSs removed from the 2014-16 List (Delistings)

Pollutant Class	San Francisco RWQCB 2	Central Coast RWQCB 3	Los Angeles RWQCB 4	Central Valley RWQC B 5	Santa Ana RWQC B 8	San Diego RWQC B 9	Pollutant Totals
Bacteria	7	11	19	4	9	5	**55**
Pesticides		14	5	24	4	1	**48**
Metals		3	19	12	2	3	**39**
Nutrient-related		10	11	2		4	**27**
Toxicity		3	1	1			**5**
Turbidity		2				1	**3**
Benthic community effects			1			1	**2**
Electrical conductivity				2			**2**
Pumping			2				**2**
Temperature		2					**2**
Water			2				**2**
Fish			1				**1**
Hydromodification			1				**1**
Sedimentation		1					**1**
Specific-conductivity		1					**1**
Totals by Regional Board	**7**	**47**	**62**	**45**	**15**	**15**	**191**

Priority Ranking and Scheduling

The State's submittal includes a priority ranking for the TMDL completion for those waters requiring a TMDL, using estimated dates for TMDL completion or completion of other actions to achieve water quality. See 2014-2016 2014-16 Water Quality Integrated Report, Appendix A. EPA finds that the priority ranking for TMDL development meets the requirements related to priority setting in 40 CFR 130. 7(b). The EPA is not acting on these priorities as federal regulations do not require the EPA approval of priority rankings or schedules.

Administrative Record Supporting This Action

In support of this decision to approve WQLSs to California's 2014-16 List, the EPA reviewed the materials submitted by California with its listing decisions. The administrative record supporting EPA's decision to approve the State's inclusion of the waters and pollutants identified on the State's 303(d) List in the 2014-16 Water Quality Integrated Report, Appendix A, Category 5 List, EPA guidance concerning preparation of Section 303(d) lists, EPA's past comments on California's listing methodology and draft lists, and EPA's decision letter and this enclosure.

The EPA is aware that the State compiled and considered additional materials (e. g., raw data and water quality analysis reports) as part of its list development process that were not included in the materials submitted to the EPA. It is unnecessary for the EPA to consider all the materials considered by the State to determine that the State complied with the applicable federal listing requirements. Federal regulations do not require the State to submit all data and information considered as part of the submittal. See 40 CFR 130. 7(b)(6)(ii). However, at the EPA's request, the State did provide additional materials, such as raw data and other relevant information. The EPA determined that the materials submitted by the State provide sufficient documentation to support the decision to partially approve, partially disapprove, and add WQLSs to the 2014-16 List.

Public comments received on the Draft 2014-16 Water Quality Integrated Report, and State Water Board Staff responses to comments, are provided on the State Water Board web page3. EPA reviewed the State's responses to comments received on the Final 2014-16 Water Quality Integrated Report. EPA found the State's responses to public comments reasonable and in accordance with federal listing requirements.

3 www. waterboards. ca. gov/water_issues/programs/tmdl/docs/integrated_report_responsetocomments. pdf

References

Submittal

State Water Resources Control Board, 2014 and 2016. California Integrated Report Clean Water Act Sections 303(d) and 305(b) Staff Report dated October 3, 2017.

State Water Resources Control Board, 2018. Transmittal of the 2014 and 2016 California Integrated Report. [Clean Water Act Sections 303(d) and 305(b)]. Letter to Tomás Torres, Region 9 Water Division Director and supporting materials, including the Integrated Report, and responsiveness summary, dated February 5, 2018.

Other Documents

CA, State Water Resources Control Board, 2015. Amendment to the Water Quality Control Plan for the Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. April 7, 2015. https://www. waterboards. ca. gov/water_issues/programs/trash_control/docs/01_final_sed. pdf

Amendment to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the control of Diazinon and Chlorpyriphos Discharges. California Regional Water Quality Control Board, Central Valley Region. Resolution r5-2014-0041. https://www. waterboards. ca. gov/centralvalley/board_decisions/adopted_orders/resolutions/r5-2014-0041_res. pdf

EPA 1978. December 28, 1978 Federal Register Notice, Total Maximum Daily Loads Under Clean Water Act, finalizing EPA's identification of pollutants suitable for TMDL calculations, 43 Fed. Reg. 60662.

EPA 1985. January 11, 1985 Federal Register Notice, 40 CFR Parts 35 and 130, Water Quality Planning and Management: Final Rule, 50 Fed. Reg. 1774.

EPA 1991. Guidance for Water Quality Based Decisions: The TMDL Process. EPA 440/4- 91-001 U. S. Environmental Protection Agency, Office of Water, Washington, DC.

EPA, 2001. 2002 Integrated Water Quality Monitoring and Assessment Report Guidance, Robert H. Wayland III, Director, Office of Wetlands, Oceans and Watersheds, November 19, 2001.

EPA. 2001. Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. EPA-823-R-01-001. January 2001

EPA, 2003a. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. Region 10 Office of Water, Seattle, WA.

EPA, 2003b. Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act; TMDL-01-03, Diane Regas, Director, Office of Wetlands, Oceans and Watersheds, July 21, 2003.
EPA, 2005. Guidance for 2006 Assessment, Listing, and Reporting Requirements Pursuant to

Sections 303(d), 305(b), and 314 of the Clean Water Act. Diane Regas, Director, Office of Wetlands, Oceans and Watersheds, July 29, 2005.

EPA, 2006. Information Concerning 2008 Clean Water Act Sections 303(d), 305(b) and 314 Integrated Reporting and Listing Decisions. Diane Regas, Director, Office of Wetlands, Oceans and Watersheds, October 12, 2006.

EPA, 2009. Information Concerning 2010 Clean Water Act Sections 303(d), 305(b) and 314 Integrated Reporting and Listing Decisions. Suzanne Schwartz, Director, Office of Wetlands, Oceans and Watersheds, May 5, 2009.

Enclosure 2:

EPA Synthesis of Continuous Temperature Data from California Department of Fish and Game and the California Department of Water Resources

This Enclosure summarizes EPA's evaluation of temperature monitoring data in certain water bodies and considers how the indicated temperatures may adversely affect designated (beneficial) migratory fishes uses.

The water bodies under consideration are the San Joaquin River (Friant Dam to Mendota Pool), San Joaquin River (Bear Creek to Mud Slough), San Joaquin River (Mud Slough to Merced River), Delta Waterways (southern portion), Delta Waterways (central portion), Delta Waterways (northern portion), Delta Waterways (western portion), Suisun Bay, and Carquinez Straight.

Applicable water quality standards for these water bodies are established in the Sacramento and San Joaquin River Basin Plan. All the aforementioned segments have the Cold Freshwater Habitat (COLD) designated use and the Migration of Aquatic Organisms (MIGR) designated use for Cold Freshwater Habitat (COLD) with a footnote indicating "salmon and steelhead" (See RWQCB Central Valley, 2009, Table II-1). The San Joaquin River (Friant Dam to Mendota Pool) segment also has the Spawning, Reproduction, and/or Early Development (SPWN) designated use for COLD with a footnote indicating "salmon and steelhead" (See RWQCB Central Valley, 2009, Table II-1, pp. II-7). Additionally, the Sacramento and San Joaquin River Basin Plan addresses temperature with the following narrative and numeric objectives: "The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. … At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature. … In determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied provided that beneficial uses will be fully protected. " (RWQCB Central Valley Region, 2009, pp. III-8)

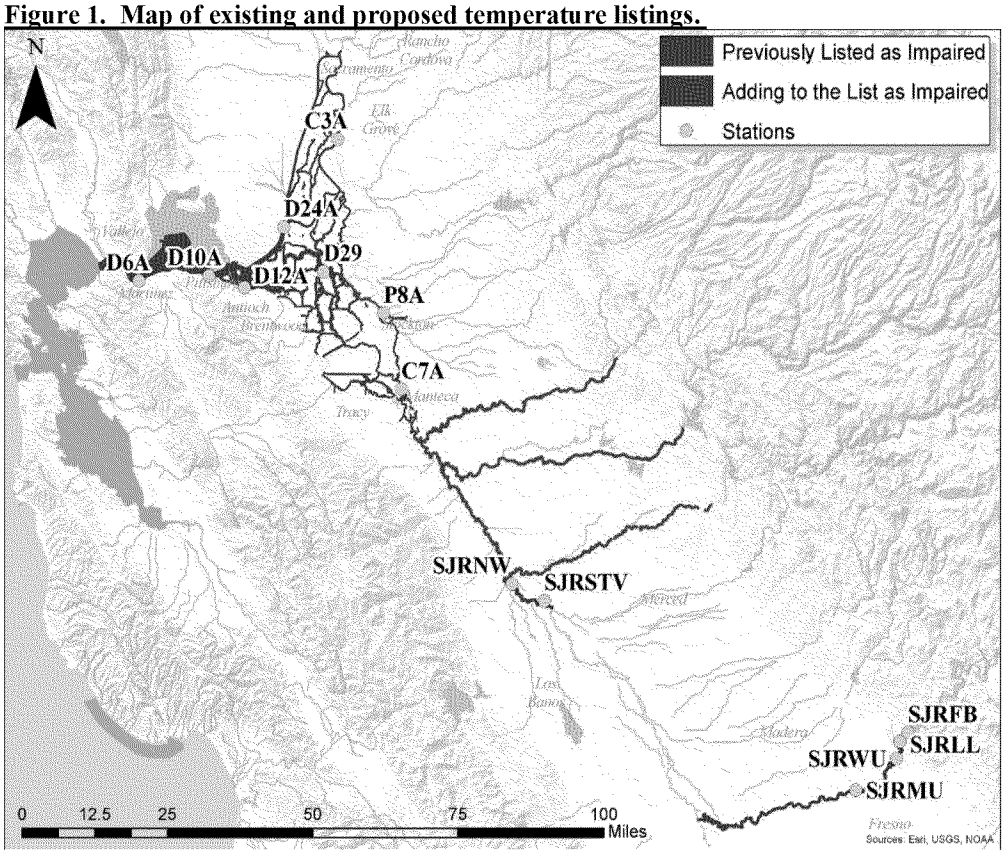
Documentation of the natural receiving water temperature is not readily available so an assessment of whether the migration and spawning uses were being achieved was conducted by comparing the current temperatures to the temperature requirements of salmonid species identified in the EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (2003a). EPA believes that the Region 10 guidance and its associated Technical Issue Papers provide the most comprehensive compilation of research related to salmonid temperature requirements available. The studies compiled in the guidance and associated papers address the full geographic extent of salmonid populations including California. The recommended numeric criteria to protect coldwater salmonids in this report were recommended for use by California's Department of Fish and Game (now Fish and Wildlife) in their temperature data submittal and subsequent comments for California's 2008-2010 303(d) list and were subsequently utilized by EPA to add water-quality limited segments to that list. Additionally, the guidance's recommended numeric criteria have been used by the National Marine Fisheries Service as thresholds when considering the suitability of expected water temperatures for Central Valley steelhead in the Stanislaus River under the proposed actions in their Biological and Conference Opinion on the

Long-term Operations of the Central Valley and State Water Project (2009). An enormous amount of temperature data has been collected for the subject segments of the San Joaquin River and its tributaries. After review of the data, EPA finds that the subject segments are not attaining the relevant numeric temperature criteria for migration, freshwater habitat and spawning of coldwater salmonids. Observed exceedances are greater than the 10% exceedance threshold for conventional and other pollutants as expressed in Table 3. 2 of the State Listing Policy. A summary of the water body specific findings is included in the following section.

Data Used by EPA

EPA Region 9 has reviewed continuous temperature data collected by the California Department of Fish and Wildlife (CDFW) for the San Joaquin River restoration project from 2002 to 2010 and data from the Department of Water Resources (DWR) from January 1, 1995 to August 30, 2010 collected the following sites shown in Figure 1 and Table 3.

Figure 1. Map of existing and proposed temperature listings.



The Region 10 guidance includes recommended temperature criteria for salmon and trout based on different life stages. The recommended temperature for salmon and trout adult migration is <20°C as a 7-day average daily maximum (7DADM) and this was applied to all delta segments and the lower two reaches of the San Joaquin River. In the upper San Joaquin River (Friant Dam to Mendota Pool) multiple life stages were assessed. For the migration life stage and the Steelhead summer rearing life stage the Salmon and Trout Migration plus Non-Core Juvenile Rearing recommendation was utilized and is <18°C 7DADM. For spawning the Salmon and Trout Spawning, Egg Incubation, and Fry Emergence recommendation was utilized and is <13°C 7DADM.

For juvenile rearing the Salmon/Trout "Core" Juvenile Rearing recommendation was utilized and is <16°C 7DADM. The evaluation thresholds and seasons during which they were applied are summarized below in Table 4.

Table 3. Waterbodies evaluated for listing

Waterbody	Size	Site Location	Site Code	Source
San Joaquin River (Friant Dam to Mendota Pool)	70 miles	SJR Friant Bridge	SJRFB	CDFW
		SJR Lost Lake	SJRLL	CDFW
		SJR Willow Unit	SJRWU	CDFW
		SJR Rank Island	SJRRI	CDFW
		SJR Sportsman Club	SJRSC	CDFW
		SJR Milburn Unit	SJRMU	CDFW
		SJR Gravely Ford	SJRGF	CDFW
San Joaquin River (Bear Creek to Mud Slough)	14 mile	SJR Stevenson Bridge	SJRSTV	CDFW
San Joaquin River (Mud Slough to Merced River)	3 miles	SJR Newman Waste Water	SJRNW	CDFW
Delta Waterways (southern portion)	3,125 acres	San Joaquin River @ Mossdale	C7A	DWR
Delta Waterways (central portion)	11,425 acres	San Joaquin River @ Prisoners Point	D29	DWR
Delta Waterways (northern portion)	6,975 acres	Sacramento River @ Hood	C3A	DWR
Delta Waterways (western portion)	14,524 acres	San Joaquin River @ Antioch Ship Channel	D12A	DWR
		Sacramento River @ Rio Vista	D24A	DWR
Suisun Bay	25,335 acres	Sacramento River @ Mallard Island	D10A	DWR
Carquinez Straight	5,657 acres	Sacramento River @ Martinez	D6A	DWR

EPA evaluated a fifteen-year period of DWR data, although additional more historical data are available. The 7-DADM measurement was calculated by eliminating any calculations with less than 7 consecutive measurements and by reviewing only the data rated as good with a "G" data quality flag by DWR. The CDFW data was similarly evaluated, however, the available data only went back as far as 2002. We assessed the number of valid 7DADM for the seasonal periods noted in Table 4 and then noted how many of those exceeded the thresholds in Table 4. Results are provided below in Table 5. These data were then evaluated for potential impairments using the binomial Table 3-2 from the California 303d listing policy and all segments were found to be impaired. It should be noted that the most upstream site in the San Joaquin River (Friant Dam to

Mendota Pool) segment did not show impairment for any life stage whereas at least one life stage was impaired in the three downstream sites.

Table 4. Evaluation Thresholds used for listing

Waterbody	Life Stage	Season	7DADM Threshold
San Joaquin River (Friant Dam to Mendota Pool)	Migration	March 15 – June 15 (smolts) September 1 – October 31 (adults)	<18ºC
	Spawning	October 1 – December 15	<13ºC
	Juvenile Rearing	March 15 – June 15	<16ºC
	Steelhead Summer Rearing	June 15 – September 15	<18ºC
San Joaquin River (Bear Creek to Mud Slough)	Migration	March 15 – June 15 (smolts) September 1 – October 31 (adults)	<20ºC
San Joaquin River (Mud Slough to Merced River)	Migration	March 15 – June 15 (smolts) September 1 – October 31 (adults)	<20ºC
Delta Waterways (southern portion)	Migration	March 15 – June 15 (smolts) September 1 – October 31 (adults)	<20ºC
Delta Waterways (central portion)	Migration	March 15 – June 15 (smolts) September 1 – October 31 (adults)	<20ºC
Delta Waterways (northern portion)	Migration	March 15 – June 15 (smolts) September 1 – October 31 (adults)	<20ºC
Delta Waterways (western portion)	Migration	March 15 – June 15 (smolts) September 1 – October 31 (adults)	<20ºC
Suisun Bay	Migration	March 15 – June 15 (smolts) September 1 – October 31 (adults)	<20ºC
Carquinez Straight	Migration	March 15 – June 15 (smolts) September 1 – October 31 (adults)	<20ºC

Table 5 Waterbodies proposed for temperature listings (bolded and *italicized* values in the last column exceed the listing thresholds for listing)

Waterbody	Site Code	Start Date	End Date	Life Stage	# of calculable 7DADMs in appropriate season	#7DADM in appropriate season which exceed
San Joaquin River (Friant Dam to Mendota Pool)	SJRFB	5/30/2002	8/1/2010	Migration	629	0
				Spawning	382	31
				Juvenile Rearing	352	0
				Steelhead Summer Rearing	400	0
	SJRLL	5/30/2002	8/1/2010	Migration	1082	0
				Spawning	501	***203***
				Juvenile Rearing	737	0
				Steelhead Summer Rearing	543	1
	SJRWU	7/8/2007	6/10/2010	Migration	457	2
				Spawning	228	***115***
				Juvenile Rearing	274	44
				Steelhead Summer Rearing	256	38
	SJRRI	8/19/2008	8/31/2010	Migration	308	44
				Spawning	152	***63***
				Juvenile Rearing	186	***47***
				Steelhead Summer Rearing	199	***89***
	SJRSC	6/4/2002	8/31/2010	Migration	439	***155***
				Spawning	104	***69***
				Juvenile Rearing	290	***180***
				Steelhead Summer Rearing	289	***283***
	SJRMU	7/2/2007	8/1/2010	Migration	431	***263***
				Spawning	160	***122***
				Juvenile Rearing	279	***197***
				Steelhead Summer Rearing	310	***310***
	SJRGF	5/26/2008	8/31/2010	Migration	329	***224***
				Spawning	152	***104***
				Juvenile Rearing	207	***129***
				Steelhead Summer Rearing	264	***264***
San Joaquin River (Bear Creek to Mud Slough)	SJRSTV	8/6/2008	1/19/2010	Migration	215	***123***
San Joaquin River (Mud Slough to Merced River)	SJRNW	9/9/2008	7/13/2009	Migration	146	***90***
Delta Waterways (southern portion)	C7A	1/01/1995	8/30/2010	Migration	1965	***749***
Delta Waterways (central portion)	D29	8/12/2008	8/30/2010	Migration	308	***118***
Delta Waterways (northern portion)	C3A	12/21/1998	8/30/2010	Migration	1492	***431***
Delta Waterways	D12A	1/03/2008	8/30/201	Migration	391	***117***

(western portion)			0			
	D24A	9/23/2008	8/30/2010	Migration	280	***74***
Suisun Bay	D10A	10/06/2008	8/30/2010	Migration	267	***48***
Carquinez Straight	D6A	1/01/1995	8/30/2010	Migration	2016	***563***

REFERENCES

CA, Department of Fish and Wildlife, March 2013. San Joaquin River Restoration Program Stream Temperature Monitoring Study Standard Operating Procedures (SOPs). 57 pages.

National Marine Fisheries Service Southwest Region. 2009. Biological and conference opinion on the long-term operations of the Central Valley Project and State Water Project. http://swr. nmfs. noaa. gov/ocap. htm

APPENDICES

Table A1. WQLS in Category 5 with existing TMDL (5b). EPA considers these to be Category 4a

Region	Water Body Name	Pollutant(s)
2	Calabazas Creek (Santa Clara County)	Diazinon
2	Lakeshore Park Beach (Marina Lagoon, San Mateo County)	Indicator Bacteria
2	Miller Point (Tomales Bay)	Indicator Bacteria
3	Alisal Creek (Monterey County)	Ammonia
3	Alisal Slough (Monterey County)	Ammonia
3	Alisal Slough (Monterey County)	Diazinon
3	Blanco Drain	Toxicity
3	Blosser Channel	Diazinon
3	Blosser Channel	Chlorpyrifos
3	Bradley Canyon Creek	Chlorpyrifos
3	Bradley Channel	Diazinon
3	Bradley Channel	Escherichia coli (E. coli)
3	Bradley Channel	Malathion
3	Chorro Creek	Sodium
3	Chorro Creek	Total Dissolved Solids
3	Chualar Creek	Oxygen, Dissolved
3	Chualar Creek, South Branch	Ammonia
3	Greene Valley Creek (Santa Barbara County)	Malathion
3	La Brea Creek	Fecal Coliform
3	Main Street Channel	Oxygen, Dissolved
3	Main Street Channel	Escherichia coli (E. coli)
3	Main Street Channel	Malathion
3	Merrit Ditch	Diazinon
3	Millers Canal	Nitrate
3	Moro Cojo Slough	Nitrate
3	Natividad Creek	Diazinon
3	Nipomo Creek	Escherichia coli (E. coli)
3	Orcutt Creek	Escherichia coli (E. coli)
3	Orcutt Creek	Malathion
3	Orcutt Creek	DDE
3	Orcutt Creek	Cyfluthrin
3	Orcutt Creek	Cyhalothrin, Lambda
3	Orcutt Creek	DDD
3	Oso Flaco Creek	Chlorpyrifos
3	Oso Flaco Creek	Malathion
3	Oso Flaco Lake	Endrin
3	Oso Flaco Lake	Toxicity
3	Oso Flaco Lake	Fecal Coliform
3	Oso Flaco Lake	Escherichia coli (E. coli)
3	Oso Flaco Lake	DDT
3	Pajaro River	Diazinon
3	Pajaro River Estuary	Diazinon
3	Salinas River Lagoon (North)	Chlorpyrifos
3	Salinas River Lagoon (North)	Toxicity
3	San Lorenzo River	Fecal Coliform
3	Santa Maria River	Diazinon
3	Santa Maria River	Cypermethrin
3	Santa Maria River	Malathion

3	Santa Maria River	DDD
3	Santa Maria River	DDE
3	Santa Maria River Estuary	Chlorpyrifos
3	Santa Maria River Estuary	DDE
3	Santa Maria River Estuary	Toxicity
3	Santa Maria River Estuary	DDD
3	Santa Maria River Estuary	Diazinon
3	Santa Maria River Estuary	Malathion
3	Santa Maria River Estuary	Oxygen, Dissolved
3	Struve Slough	Fecal Coliform
3	Tembladero Slough	Oxygen, Dissolved
3	Trout Creek Gulch	Fecal Coliform
3	Unnamed tributary to Orcutt Creek	Toxicity
3	Unnamed tributary to Orcutt Creek	Toxicity
3	Unnamed tributary to Orcutt Creek	Chlorpyrifos
3	Unnamed tributary to Orcutt Creek	Chlorpyrifos
3	Unnamed tributary to Orcutt Creek	Diazinon
3	Unnamed tributary to Orcutt Creek	Diazinon
3	Unnamed tributary to Orcutt Creek	Ammonia
3	Unnamed tributary to Orcutt Creek	Ammonia
3	Unnamed tributary to Orcutt Creek	Nitrate
3	Unnamed tributary to Orcutt Creek	Nitrate
3	Valencia Creek	Fecal Coliform
3	Watsonville Slough	Fecal Coliform
4	Balboa Lake	Ammonia
4	Bull Creek (Los Angeles County)	Ammonia
4	Calleguas Creek Reach 9A (was lower part of Conejo Creek Reach 1 on 1998 303d list)	Nitrogen, Nitrite
4	Compton Creek	Zinc
4	Dominguez Channel Estuary (unlined portion below Vermont Ave)	Copper
4	Duck Pond Agricultural Drains/Mugu Drain/Oxnard Drain No 2	DDD
4	Duck Pond Agricultural Drains/Mugu Drain/Oxnard Drain No 2	DDE
4	Duck Pond Agricultural Drains/Mugu Drain/Oxnard Drain No 2	Chlorpyrifos
4	Echo Park Lake	Chlordane
4	Echo Park Lake	Dieldrin
4	Fox Barranca (tributary to Calleguas Creek Reach 6)	Chlordane
4	Fox Barranca (tributary to Calleguas Creek Reach 6)	DDT
4	Fox Barranca (tributary to Calleguas Creek Reach 6)	DDE
4	Honda Barranca	DDE
4	Honda Barranca	DDD
4	Honda Barranca	Chlorpyrifos
4	Honda Barranca	DDT
4	Honda Barranca	Chlordane
4	Los Angeles River Reach 3 (Figueroa St. to Riverside Dr.)	Indicator Bacteria
4	Los Angeles River Reach 6 (Above Sepulveda Flood Control Basin)	Copper
4	Rio De Santa Clara/Oxnard Drain No. 3	DDD
4	Rio De Santa Clara/Oxnard Drain No. 3	DDE
4	Rio Hondo Reach 3 (above Spreading Grounds)	Indicator Bacteria
4	San Gabriel River Estuary	Indicator Bacteria
4	Santa Clara River Reach 3 (Freeman Diversion to A Street)	Indicator Bacteria
4	Wildlife Lake	Ammonia
8	San Diego Creek Reach 1	DDT
9	Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock	Indicator Bacteria
9	Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek	Indicator Bacteria

9	Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall	Indicator Bacteria
9	Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall	Indicator Bacteria
9	Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall	Indicator Bacteria
9	Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall	Indicator Bacteria
9	Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall	Indicator Bacteria
9	Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall	Indicator Bacteria
9	Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall	Indicator Bacteria
9	Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground	Indicator Bacteria
9	Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach	Indicator Bacteria
9	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier	Indicator Bacteria
9	Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road	Indicator Bacteria
9	Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue	Indicator Bacteria

Table A2. WQLS in Category 5 with a program to achieve water quality (5C). EPA considers these to be 4b

Region	Water Body Name	Decision Pollutant(s)
3	San Antonio Creek (San Antonio Watershed, Rancho del las Flores Bridge at Hwy 135 to downstream at Railroad Bridge)	Nitrate
4	Hueneme Drain	Trash
4	J Street Drain (Ventura County)	Trash
4	Ormond Beach Wetlands	Trash
4	Oxnard Drain	Trash
4	Sanjon Barranca Creek	Trash
4	Santa Clara River Reach 1 (Estuary to Hwy 101 Bridge)	Trash
4	Santa Clara River Reach 3 (Freeman Diversion to A Street)	Trash
4	Santa Clara River Reach 5 (Blue Cut gaging station to West Pier Hwy 99 Bridge) (was named Santa Clara River Reach 7 on 2002 303(d) list)	Trash
4	Santa Clara River Reach 10 (Sespe Creek, from confl with Santa Clara River Reach 3 to above gaging station - 500 ft downstream from Little Sespe Cr)	Trash
4	Santa Clara River Reach 4A (A Street, Fillmore to Piru Creek)	Trash
4	Santa Paula Creek Reach 1 (confluence w Santa Clara River to Diverson Dam)	Trash
5	Cottonwood Creek (S Madera County)	Diuron
5	Dry Creek (Madera County)	Diuron
5	Dry Creek (Madera County)	Diazinon
5	Dry Creek (tributary to Tuolumne River at Modesto, E Stanislaus County)	Diuron
5	Hospital Creek (San Joaquin and Stanislaus Counties)	Chlorpyrifos
5	Hospital Creek (San Joaquin and Stanislaus Counties)	Diuron
5	Hospital Creek (San Joaquin and Stanislaus Counties)	Methyl Parathion
5	Ingram Creek (from confluence with Hospital Creek to Hwy 33 crossing)	Chlorpyrifos
5	Ingram Creek (from confluence with Hospital Creek to Hwy 33 crossing)	Diuron
5	Littlejohns Creek	Chlorpyrifos
5	Lone Tree Creek	Diazinon
5	Main Drain (Kern County)	Diuron
5	Orestimba Creek (above Kilburn Road)	Diuron
5	Pine Creek (Butte County)	Chlorpyrifos
5	Ramona Lake	Diuron
5	Salt Slough (Mud Slough to Sand Dam, Merced County)	Chlorpyrifos
5	San Joaquin River (Bear Creek to Mud Slough)	Diuron
5	Sand Creek (tributary to Marsh Creek, Contra Costa County; partly in Delta Waterways, western portion)	Diazinon
5	Snake River (Butte and Sutter Counties)	Chlorpyrifos

5	Temple Creek	Chlorpyrifos
5	Ulatis Creek (Solano County)	Diuron
5	Walker Creek (Glenn County)	Chlorpyrifos
5	Willow Slough Bypass (Yolo County)	Chlorpyrifos
5	Willow Slough Bypass (Yolo County)	Diuron
9	Mission Bay Shoreline, at Enchanted Cove	Trash
9	Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)	Trash
9	Pacific Ocean Shoreline, Coronado HA, at G Ave, Central Beach	Trash
9	Pacific Ocean Shoreline, Imperial Beach Pier	Trash
9	Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth	Trash
9	Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave	Trash
9	Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset	Trash
9	Pacific Ocean Shoreline, Point Loma HA, at Sunset Cliffs and Froude Street	Trash
9	Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park	Trash
9	Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue	Trash
9	Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at parking lot entrance	Trash
9	Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way	Trash
9	Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near San Fernando Place)	Trash
9	Pacific Ocean Shoreline, Scripps HA, at Crystal Pier	Trash
9	Pacific Ocean Shoreline, Scripps HA, at North Lane at Windansea Beach	Trash
9	Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Drive, Pacific Beach	Trash
9	Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach	Trash
9	Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach	Trash
9	Pacific Ocean Shoreline, Torrey Pines State Beach, at North Beach Entrance parking lot	Trash

Table A3. WQLS with an existing TMDL in place and no other impairments(4a). Does not include State waterbody pollutant combinations in State Category 5b)

Region	Water Body Name	Pollutant(s)
3	Alisal Slough (Monterey County)	Oxygen, Dissolved
3	Blanco Drain	Oxygen, Dissolved
3	Clear Creek (San Benito County)	Mercury
3	San Antonio Creek (Rancho del las Flores Bridge at Hwy 135 to RR Bridge)	Chlorpyrifos
3	San Luis Obispo Creek (below Osos Street)	Nutrients
3	Struve Slough	Bacteria
3	Watsonville Slough	Bacteria
4	Abalone Cove Beach	Bacteria
4	Ballona Creek	Selenium
4	Bluff Cove Beach	Bacteria
4	Cabrillo Beach (Outer)	Bacteria
4	Calleguas Creek Reach 10 (Conejo Creek (Hill Canyon)-was part of Conejo Crk Reaches 2 & 3, and lower Conejo Crk/Arroyo Conejo N Fk on 1998 303d list)	Endosulfan (tissue)
4	Calleguas Creek Reach 12 (was Conejo Creek/Arroyo Conejo North Fork on 1998 303d list)	Ammonia
4	Coyote Creek	Lead
4	Dominguez Channel (lined portion above Vermont Ave)	Diazinon
4	Dominguez Channel Estuary (unlined portion below Vermont Ave)	Zinc (sediment)
4	Hermosa Beach	Bacteria
4	Lake Sherwood	Ammonia
4	Lake Sherwood	Organic Enrichment/ Low Oxygen
4	Leo Carillo Beach (South of County Line)	Bacteria

4	Lincoln Park Lake	Lead
4	Long Point Beach	Bacteria
4	Los Angeles River Reach 3 (Figueroa St. to Riverside Dr.)	Lead
4	Los Angeles River Reach 4 (Sepulveda Dr. to Sepulveda Dam)	Copper
4	Los Angeles River Reach 4 (Sepulveda Dr. to Sepulveda Dam)	Ammonia
4	Los Angeles River Reach 4 (Sepulveda Dr. to Sepulveda Dam)	Lead
4	Los Angeles/Long Beach Inner Harbor	Bacteria
4	Malaga Cove Beach	Bacteria
4	Manhattan Beach	Bacteria
4	Nicholas Canyon Beach	Bacteria
4	Point Dume Beach	Bacteria
4	Point Fermin Park Beach	Bacteria
4	Portuguese Bend Beach	Bacteria
4	Robert H. Meyer Memorial Beach	Bacteria
4	Royal Palms Beach	Bacteria
4	San Gabriel River Reach 2 (Firestone to Whittier Narrows Dam	Bacteria
4	Santa Clara River Reach 3 (Freeman Diversion to A Street)	Ammonia
5	Elk Grove Creek	Chlorpyrifos
5	Marsh Creek (Marsh Creek Reservoir to San Joaquin River; partly in Delta Waterways)	Diazinon
5	San Joaquin River (Bear Creek to Mud Slough)	Chlorpyrifos
5	San Joaquin River (Merced River to Tuolumne River)	Boron
5	San Joaquin River (Stanislaus River to Delta Boundary)	Electrical Conductivity
8	Newport Bay, Lower (entire lower bay, including Rhine Channel, Turning Basin and South Lido Channel to east end of H-J Moorings)	Chlorpyrifos
8	Newport Bay, Upper (Ecological Reserve)	Chlorpyrifos
8	San Diego Creek Reach 1	Pesticides
9	Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach	Bacteria
9	Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove	Bacteria
9	Pacific Ocean Shoreline, Scripps HA, at Ravina	Bacteria