

California Regional Water Quality Control Board  
North Coast Region

ORDER NO. R1-2011-0024

REQUIRING TECHNICAL INFORMATION  
PURSUANT TO WATER CODE SECTION 13267

FOR

California Department of Transportation  
CDOT - Highway 101 Willits Bypass Project  
WDID No. 1B10019WNME  
Mendocino County

The California Regional Water Quality Control Board, North Coast Region (hereinafter Regional Water Board) finds that:

1. The California Department of Transportation (hereinafter Caltrans), as project sponsor for the Highway 101 Willits Bypass (Project), is regulated by the following permits administered by the Regional Water Board:
  - a) Clean Water Act section 401 Water Quality Certification (Water Quality Certification) as WDID No. 1B10019WNME.
  - b) Order No. 99-06-DWQ, the National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from Caltrans Properties, Facilities, and Activities (Storm Water Permit).
2. The Caltrans Storm Water Permit contains enforceable requirements intended to control the discharge of pollutants from construction projects. Additionally, the Water Quality Certification contains conditions for specific projects to protect water quality. These requirements and conditions are necessary to prevent discharges of sediment or other pollutants (i.e., waste) from projects that can cause or contribute to violations of applicable water quality standards.
3. In recent months Caltrans has violated multiple sections of the California Water Code and the Clean Water Act while conducting activities associated with the Project (see Regional Water Board Notice of Violation, dated August 26, 2010.)
4. On August 10, 2010, Caltrans submitted a technical memorandum entitled *Willits Bypass Project - Soil Characteristics and Proposed Wetland Creation Sites in Little Lake Valley* (Soils Memo) to the Regional Water Board, United States Army Corps of Engineers (USACE), United States Environmental Protection Agency (USEPA), and the California Department of Fish and Game (CDFG). The memo provided information about the assessment of subsurface soil conditions at the proposed mitigation properties associated with the Project.

5. In previous meetings and discussions, most notably on July 13, 2010, Regional Water Board staff informed Caltrans of concerns about potentially hazardous substances derived from old sawmill disposal activities located at the Ford Parcel (APN 108-010-06), in the area of the proposed wetland creation sites.
6. As described within the Soils Memo, Section 3.1.2, Wetland Establishment Sites, Caltrans provided the following description of the Ford parcel: "The four soil pits excavated in the establishment site show that the fill material consists of a heterogeneous mixture of gravelly loam, lumber waste, tree bark, and ash approximately 52 to 80 inches thick."
7. The USEPA replied with several specific questions regarding the information presented in the Soils Memo, as follows:
  - a) Is there any evidence that the old mill site treated wood (e.g. with creosote), or did it only process natural wood? Was there any evidence of treated wood in the fill material at the Ford Parcel? If there is evidence of treated wood, some soil chemistry analysis may be necessary at the Ford parcel.
  - b) Our understanding is that the material to be removed from the Ford parcels is currently proposed for use as road base in the bypass. Given what was learned about the material present at this site, is it still appropriate for road base material? If not, can the wetland construction at the Ford parcel be moved up in the schedule?
8. In response to these questions, on August 26, 2010, Caltrans staff submitted an information update (Willits Follow Up Response Memo, dated August 25, 2010) on the conditions of the proposed wetland creation sites and information presented in the August 10, 2010 Soils Memo.
  - a) "During the July 2010 soil evaluation at the wetland establishment site at the Ford parcel, no treated wood was observed where soil pits were excavated in the fill material. Crews did uncover a utility pole in one of the pits, but because it had been buried for many years, it was difficult to determine whether the pole had been treated with creosote; however, the crew did not observe any obvious creosote coating on the pole. Based on the results of the July 2010 soil evaluation, the fill material consists mostly of bark, natural wood and lumber pieces, partly burned wood, and ash. In addition, Caltrans has conducted hazardous materials reconnaissance and assessment for the mitigation parcels, including Ford. The results of the assessment identified no significant hazardous waste/material issues at the parcel (see attached)."
  - b) "Caltrans has determined that the fill material can be used for fill in the bypass project alignment. As such, the schedule in the MMP for wetland establishment at the Ford parcel (with the proposed wetland establishment

site being constructed toward the end of the Phase 1 construction schedule) is still accurate.”

#### **401 Certification Violations:**

The Water Quality Certification issued for the Project includes the following Conditions, which Regional Water Board staff find have been violated.

1. Condition 44. Any potentially hazardous waste(s) (solids, liquids, or slurries) derived or encountered in this project shall undergo the appropriate characterization to demonstrate compliance with all applicable waste disposal laws and regulations. If unanticipated or anticipated waste are encountered or created during the project, Caltrans shall notify the Regional Water Board immediately and at least within 24 hours. Caltrans or their contractor shall prepare applicable work plans for handling, treating, transporting, and disposing of waste. The work plans shall be prepared and signed by an engineer or geologist with the appropriate and valid California licenses.

The soil assessment on the Ford Parcel was conducted on July 29, 2010 prior to issuance of the 401 Certification (August 6, 2010). Therefore, is it understandable that the Regional Water Board would not be notified within 24 hours in accordance with condition 44. However, Caltrans should have properly notified the Regional Water Board about the discovery of potentially hazardous materials in light of advanced warning and after receiving and reviewing the conditions of the 401 Certification in regards to encountering anticipated or unanticipated waste during project activities. Therefore, the lack of proper notification constitutes a violation of Condition 44 of the 401 Certification.

The information presented in the Soils Memo (August 10, 2010), the response to USEPA (August 26, 2010), and recent correspondence with Caltrans (September 28, 2010) fails to adequately consider how the recently discovered lumber waste, burnt wood, and ash may adversely affect the quality and/or beneficial uses of Waters of the State and any potential wetland establishment site. Currently, the level of assessment at the Ford Parcel is not sufficient to alleviate the Regional Water Board's concerns related to proper waste characterization, disposal, and wetland creation.

2. Condition 45. Caltrans shall provide analysis and verification that placing non-hazardous waste or inert materials (which may include discarded product or recycled materials) will not result in degradation of water quality, human health, or the environment. All project-generated waste shall be handled, transported, and disposed in strict compliance with all applicable State and Federal laws and regulations. When operations are complete, any excess material or debris shall be removed from the work area and disposed of properly and in

accordance with the Special Provisions for the project and/or Standard Specification 7-1.13, Disposal of Material Outside the Highway Right of Way. Caltrans shall submit to the Regional Water Board the satisfactory evidence provided to the Caltrans Engineer by the Contractor referenced in Standard Specification 7-1.13. In accordance with State and Federal laws and regulations, Caltrans is liable and responsible for the proper disposal of waste generated by their project.

As indicated in the August 25, 2010 memo, "Caltrans has determined that the fill material is appropriate to use within the bypass structure." However, condition 44 clearly states that Caltrans shall appropriately characterize all encountered wastes and prepare work plans for handling, treating, and disposing of waste. In addition, condition 45 requires Caltrans to provide analysis and verification that non-hazardous waste or inert materials will not result in the degradation of water quality, human health, or the environment. Therefore, planning to incorporate inadequately characterized waste within the bypass without authorization from the Regional Water Board constitutes violations of conditions 44 and 45 of the 401 Certification.

#### **REQUIREMENT FOR TECHNICAL INFORMATION UNDER WATER CODE §13267**

This potential threat to water quality warrants formal investigation. Under the Water Code section 13267, the Regional Water Board may require "any person who has discharged, discharges, or is suspected of discharging, or proposes to discharge waste" to furnish "technical or monitoring program reports." The information required below is necessary to protect water quality and protect the associated beneficial uses. The burden of providing the information set out below bears a reasonable relationship to the need for the information and the public benefits to be derived from that information.

The following sections of the California Water Code authorize the Regional Water Board Executive Officer to impose requirements upon persons suspected of discharging waste that could affect the quality of waters within this region:

- a. Section 13260 (a) – "All of the following persons shall file with the appropriate regional board a report of the discharge, containing the information which may be required by the regional board: (1) Any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state, other than into a community sewer system."
- b. Section 13267(a) - "A regional board, in establishing or reviewing any water quality control plan or waste discharge requirements, or in connection with any action relating to any plan or requirement or authorized by this division, may investigate the quality of any waters of the state within its region."

- c. Section 13267(b) - "In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or proposes to discharge waste within its region...that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires."
  - d. Section 13267(c) - "In conducting an investigation pursuant to subdivision (a), the regional board may inspect the facilities of any person to ascertain whether the purposes of this division are being met and waste discharge requirements are being complied with. The inspection shall be made with the consent of the owner or possessor of the facilities or, if the consent is withheld, with a warrant duly issued pursuant to the procedure set forth in Title 13 (commencing with Section 1822.50) of Part 3 of the Code of Civil Procedure. However, in the event of an emergency affecting the public health or safety, an inspection may be performed without consent or the issuance of a warrant."
9. Technical reports required by this Order are necessary to ensure that the prior harm and future threat to water quality created by the discharges described above are properly abated and controlled. In order to proceed with wetland creation as part of the certified mitigation actions, Caltrans must demonstrate that the solid waste disposal site (proposed wetland creation area) is appropriate for conversion into an aquatic habitat and will not exceed the appropriate water quality objectives and/or background levels of soil, surface water, and groundwater for those constituent of concern.
  10. Failure to comply with the terms of this Order may result in enforcement under the California Water Code. Any person failing to provide technical reports containing information required by this Order by the required date(s) or falsifying any information in the technical reports is, pursuant to Water Code Section 13268, guilty of a misdemeanor and may be subject to administrative civil liabilities of up to one thousand dollars (\$1,000.00) for each day in which the violation occurs. Any person failing to clean up or abate threatened or actual discharges as required by this Order is, pursuant to Water Code section 13385, subject to administrative civil liabilities of up to five thousand dollars (\$5,000.00) per day or ten dollars (\$10) per gallon of waste discharged. Any person discharging waste into navigable waters of the United States without waste discharge requirements is, pursuant to Water Code Section 13385(c), subject to administrative civil liabilities of up to ten thousand dollars (\$10,000.00) per day in which the discharge occurs plus ten dollars (\$10.00) per gallon of waste discharged, and may also be subject to criminal prosecution pursuant to Water Code Section 13387.

11. Any person affected by this action of the Regional Water Board may petition the State Water Resources Control Board (State Water Board) to review the action in accordance with California Water Code section 13320 and title 23, California Code of Regulations, section 2050. The petition must be received by the State Water Board within 30 days of the date of this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request. In addition to filing a petition with the State Board, any person affected by this Order may request the Regional Water Board to reconsider this Order. To be timely, any such request must be made within 30 days of the date of this Order. Note that even if reconsideration by the Regional Water Board is sought, filing a petition with the State Water Board within the 30 day period is necessary to preserve the petitioner's legal rights. If you choose to request reconsideration of this Order or file a petition with the State Water Board, be advised that you must comply with the Order while your request for reconsideration and/or petition is being considered.

THEREFORE, IT IS HEREBY ORDERED that, pursuant to California Water Code Section 13267 Caltrans shall:

1. Submit to the Executive Officer a work plan to define the complete horizontal and vertical extent of contamination in soil, groundwater, and surface water at the proposed wetland mitigation site. The work plan shall include a reasonable schedule for implementation, and is due to the Regional Water Board no later than May 31, 2011.
  - Tables A and B provide the groundwater and surface water quality objectives (WQOs) for the constituents of concern (COCs) typically found at lumber mills and/or mill disposal sites. Metals, furans/dioxins, volatile and semi-volatile organic compounds, petroleum hydrocarbons and wood treatment chemicals (e.g. metals, pentachlorophenol, fungicides, etc.) are typically associated with lumber mills. The proposed sampling program for soil and groundwater must include the COCs that may be associated with activities at lumber mills and associated disposal areas.
  - For your information, the process to establish soil remediation goals for these sites is found in Title 27 of the California Code of Regulations. These regulations indicate that site COCs will be abated to background levels where feasible. Section 20400 of Title 27 outlines the steps that must be completed if any level of contamination other than background is to be left in place. Background samples and/or existing data from the site must be used for comparison with your investigation results and evaluated against the Title 27 requirements.
2. Caltrans shall implement the work plan within 30 days of concurrence with the work plan by the Executive Officer.

3. Caltrans shall submit a report of investigative findings within 60 days of completing the work set out in the plan to define the extent of soil and surface and groundwater contamination. The report of investigative findings must include recommendations for any further investigative activities, monitoring of defined contaminant plumes; the report shall also include a plan for waste disposal. Pursuant to California Water Code 13260 and California Code of Regulations Title 27, which regulate land disposal activities, the Regional Water Board requires proof that placing non-hazardous waste or inert materials (which may include discarded product or recycled materials) will not result in degradation of water quality, human health, or the environment
4. If necessary, Caltrans shall, within 30 days of defining the complete vertical and horizontal extent of the soil and surface and/or groundwater contamination, submit to the Executive Officer a feasibility study/remedial action plan to cleanup the contamination in soil and surface and/or groundwater. The remedial action plan shall contain a reasonable schedule for implementing the recommended cleanup activities.
5. If necessary, Caltrans shall implement the selected remedial action within 60 days of concurrence of the remedy by the Executive Officer.

If Caltrans is unable to perform any activity or to submit any documentation in compliance with the deadlines in this Order, Caltrans may submit a written request to the Executive Officer for an extension of the time schedule. The written extension request shall explain why the delay is beyond the reasonable control of Caltrans and must be received by the Regional Water Board no less than 15 calendar days prior to the respective deadline. An extension may be granted by the Executive Officer, for good cause, in which case this Order will be accordingly revised.

All information provided in response to this Order must include the following signed certification statement:

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

The foregoing report is needed to address the potential water quality threats at off-site mitigation parcels. The report required by this Order will allow Regional Water Board staff to determine the mitigation and other measures that are needed to protect water

quality and ensure that similar violations do not recur. In addition, the information within the required report may be used to determine if Waste Discharge Requirements, or a Waiver of Waste Discharge Requirements, is necessary or for further enforcement actions taken against Caltrans.

Ordered by \_\_\_\_\_

Catherine Kuhlman  
Executive Officer

March 30, 2011

### Table A. Groundwater Water Quality Objectives

The California Water Code, and regulations and policies developed thereunder require cleanup and abatement of discharges and threatened discharges of waste to the extent feasible. Cleanup and abatement activities must provide attainment of background levels of water quality, or the highest water quality that is reasonable, if background levels of water quality cannot be restored. Alternative cleanup levels greater than background concentration shall be permitted only if the discharger demonstrates that: it is not feasible to attain background levels; the alternative cleanup levels are consistent with the maximum benefit to the people of the State; alternative cleanup levels will not unreasonably affect present and potential beneficial uses of such water; and they will not result in water quality less than prescribed in the Water Quality Control Plan for the North Coast Region (Basin Plan) and Policies adopted by the State and Regional Water Board (State Water Resources Control Board Resolutions Nos. 68-16 and 92-49).

Water quality objectives in the Basin Plan are adopted to ensure protection of the beneficial uses of water. The Basin Plan provides that “whenever several different objectives exist for the same water quality parameter, the strictest objective applies”. Accordingly, the most stringent water quality objectives for protection of all beneficial uses are selected as the protective water quality criteria. Alternative cleanup and abatement actions must evaluate the feasibility of, at a minimum: (1) cleanup to background levels, (2) cleanup to levels attainable through application of best practicable technology, and (3) cleanup to protective water quality criteria levels. The table below sets out the water quality objectives for waters of the State impacted by discharges from the identified constituents of concern:

Constituent of Concern	Practical Quantitation Limit ug/l	Water Quality Objective <sup>1</sup> ug/l	Reference for Objective
Trichloroethylene	< 0.5	0.8	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
Tetrachloroethylene	< 0.5	0.06	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to

<sup>1</sup> Practical quantitation limits are based on current technology. For instances where technology cannot achieve the water quality objective, the practical quantitation limit will be used.

<b>Constituent of Concern</b>	<b>Practical Quantitation Limit ug/l</b>	<b>Water Quality Objective<sup>1</sup> ug/l</b>	<b>Reference for Objective</b>
			GENERAL water quality objective in the Basin Plan
Cis-1,2-Dichloroethene	< 0.5	6	California Department of Health Services Maximum Contaminant Level applied to the GENERAL water quality objective in the Basin Plan
Trans-1,2-dichloroethene	< 0.5	10	California Department of Health Services Maximum Contaminant Level applied to the GENERAL water quality objective in the Basin Plan
1,1-Dichloroethylene	< 0.5	0.6	US EPA Health Advisory applied to the GENERAL water quality objective in the Basin Plan
Trichlorotrifluoroethane	< 0.5	150	California Department of Health Services Maximum Contaminant Level applied to the GENERAL water quality objective in the Basin Plan
1,1,1-Trichloroethane	< 0.5	200	California Department of Health Services Maximum Contaminant Level applied to the GENERAL water quality objective in the Basin Plan
Trichloromethane	< 0.5	1.1	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan
Bromodichloromethane	< 0.5	0.27	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan
Acetone	< 0.5	6300	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan

<b>Constituent of Concern</b>	<b>Practical Quantitation Limit ug/l</b>	<b>Water Quality Objective<sup>1</sup> ug/l</b>	<b>Reference for Objective</b>
Methyl t-Butyl Ether	< 0.5	5	California Department of Health Services Secondary Maximum Contaminant Level applied to the TASTE and ODOR water quality objective in the Basin Plan
1,2,4-Trimethylbenzene	< 0.5	330	California Department of Health Services Notification Level applied to GENERAL water quality objective in the Basin Plan
1,3,5-Trimethylbenzene	< 0.5	15	Published literature provides a taste and odor threshold of 15 ug/l which is applied to the narrative TASTE AND ODOR water quality objective of the Basin Plan
sec-Butylbenzene	< 0.5	260	California Department of Health Services Notification Level applied to GENERAL water quality objective in the Basin Plan
tert-Butylbenzene	< 0.5	260	California Department of Health Services Notification Level applied to GENERAL water quality objective in the Basin Plan
n-Propylbenzene	< 0.5	260	California Department of Health Services Notification Level applied to GENERAL water quality objective in the Basin Plan
n-Butylbenzene	< 0.5	260	California Department of Health Services Notification Level applied to GENERAL water quality objective in the Basin Plan
Isopropylbenzene (Cumene)	< 0.5	0.8	Published literature provides a taste and odor threshold of 0.8 ug/l which is applied to the narrative TASTE AND ODOR water quality objective of the Basin Plan
4-isopropyl Toluene	< 0.5	none available	
Vinyl Chloride	< 0.5	0.05	California Public Health Goal (PHG) in Drinking Water (Office

Constituent of Concern	Practical Quantitation Limit ug/l	Water Quality Objective <sup>1</sup> ug/l	Reference for Objective
			of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
Pentachlorophenol	< 0.2	0.4	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
2, 3, 4, 6-Tetrachlorophenol	< 0.2	1.0	US EPA National Ambient Water Quality Criteria, Human Health and Welfare Protection applied to TASTE AND ODOR water quality objective in the Basin Plan.
2, 4, 5-Trichlorophenol	< 0.2	1.0	US EPA National Ambient Water Quality Criteria, Human Health and Welfare Protection applied to TASTE AND ODOR water quality objective in the Basin Plan.
2, 4, 6-Trichlorophenol	< 0.2	0.5	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan
Methanol	< 50	3500	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan
Phenylmercuric Acetate	< 0.2	0.6	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan
Gasoline	< 50	5.0	Published literature provides a taste and odor threshold of 5 ug/l which is applied to the narrative TASTE AND ODOR water quality objective of the Basin Plan

Constituent of Concern	Practical Quantitation Limit ug/l	Water Quality Objective <sup>1</sup> ug/l	Reference for Objective
Diesel	< 50	100	US EPA health advisory of September 4, 1992, Suggested No Adverse Response Level (SNARL) applied to TASTE AND ODOR water quality objective in the Basin Plan
Motor Oil	< 175	100	US EPA health advisory Suggested No Adverse Response Level (SNARL) of 0.1 ug/l to 1.0 ug/l applied to GENERAL water quality objective in the Basin Plan
Furan	< 0.0001	7.0	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan
2,3,7,8-TCDD (Dioxin) <sup>2</sup>	< 0.0001	2.7 E-7	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan

<sup>2</sup> Toxicity equivalency factors (TEF) are used to determine the relative toxicity of chlorinated dibenzodioxin (CDD) and chlorinated dibenzofuran (CDF) congeners. The following table represents applicable isomer groups and their associated TEF.

Isomer Group	Toxicity Equivalence Factor	Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0	2,3,7,8 tetra CDF	0.1
2,3,7,8-penta CDD	0.5	1,2,3,7,8 penta CDF	0.05
2,3,7,8-hexa CDD	0.1	2,3,4,7,8 penta CDF	0.5
2,3,7,8-hepta CDD	0.01	2,3,7,8 hexa CDF	0.1
octa CDD	0.001	2,3,7,8 hepta CDF	0.01

<b>Constituent of Concern</b>	<b>Practical Quantitation Limit ug/l</b>	<b>Water Quality Objective<sup>1</sup> ug/l</b>	<b>Reference for Objective</b>
Benzene	< 0.5	0.15	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
Toluene	< 0.5	42	US EPA National Ambient Water Quality Criteria, Human Health and Welfare Protection applied to TASTE AND ODOR water quality objective in the Basin Plan
Ethylbenzene	< 0.5	3.2	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan
Xylenes	< 0.5	17	US EPA National Ambient Water Quality Criteria, Human Health and Welfare Protection applied to TASTE AND ODOR water quality objective in the Basin Plan
Acenaphthene	< 0.1	20	US EPA National Ambient Water Quality Criteria, Human Health and Welfare Protection applied to TASTE AND ODOR water quality objective in the Basin Plan.
Anthracene	< 0.1	2100	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan
Benz(a)Anthracene	< 0.1	0.04	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan
Benzo(b)Fluoranthene	< 0.1	0.04	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan
Benzo(k)Fluoranthene	< 0.1	0.04	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan

<b>Constituent of Concern</b>	<b>Practical Quantitation Limit ug/l</b>	<b>Water Quality Objective<sup>1</sup> ug/l</b>	<b>Reference for Objective</b>
Benzo(a)Pyrene	< 0.1	0.0029	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan
Chrysene	< 0.1	0.04	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan
Dibenz(a,h)Anthracene	< 0.1	0.0085	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan
Fluoranthene	< 0.1	280	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan
Fluorene	< 0.1	280	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan
Indeno(1,2,3-c,d)Pyrene	< 0.1	0.04	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan
Naphthalene	< 1.0	21	Published literature provides a taste and odor threshold of 21 ug/l which is applied to the narrative TASTE AND ODOR water quality objective of the Basin Plan
Phenol	< 1.0	2100	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan
Pyrene	< 0.1	210	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan
Arsenic	< 2.0	0.0037	Cal/EPA Cancer Potency Factor applied to GENERAL water quality objective in the Basin Plan

<b>Constituent of Concern</b>	<b>Practical Quantitation Limit ug/l</b>	<b>Water Quality Objective<sup>1</sup> ug/l</b>	<b>Reference for Objective</b>
Barium	< 2.0	1000	California Department of Health Services Maximum Contaminant Level applied to the GENERAL water quality objective in the Basin Plan
Cadmium	< 2.0	0.04	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
Chromium (Total)	< 2.0	50	California Department of Health Services Maximum Contaminant Level applied to TOXICITY water quality objective in the Basin Plan
Chromium (VI)	< 2.0	21	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan
Copper	< 2.0	300	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
Iron	< 2.0	300	California Department of Health Services Secondary Maximum Contaminant Level applied to the TASTE & ODOR water quality objective in the Basin Plan
Lead	< 2.0	2.0	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
Manganese	< 2.0	50	California Department of Health Services Secondary Maximum Contaminant Level applied to the GENERAL water quality objective in the Basin Plan

<b>Constituent of Concern</b>	<b>Practical Quantitation Limit ug/l</b>	<b>Water Quality Objective<sup>1</sup> ug/l</b>	<b>Reference for Objective</b>
Mercury	< 0.2	1.2	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
Nickel	< 2.0	12	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
Zinc	< 2.0	2100	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to GENERAL water quality objective in the Basin Plan
Phenanthrene	<0.1	None available	
1,1 Dichloroethane	<0.5	3	California PHG in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
1,2 Dichloroethane	<0.5	0.4	California PHG in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan
1,1,2 Trichloroethane	<0.5	0.3	California PHG in Drinking Water (Office of Environmental Health Hazard Assessment) applied to GENERAL water quality objective in the Basin Plan

**Table B. Surface Water Freshwater Water Quality Objectives**

<b>Constituent of Concern</b>	<b>Practical Quantitation Limit ug/l</b>	<b>Water Quality Objective<sup>3</sup> ug/l</b>	<b>Reference for Objective</b>
Trichloroethene	< 0.5	0.8	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to TOXICITY water quality objective in the Basin Plan
Tetrachloroethene	< 0.5	0.06	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to TOXICITY water quality objective in the Basin Plan
Cis-1,2-Dichloroethene	< 0.5	6	California Department of Health Services Maximum Contaminant Level applied to the TOXICITY water quality objective in the Basin Plan
Trans-1,2-dichloroethene	< 0.5	10	California Department of Health Services Maximum Contaminant Level applied to the TOXICITY water quality objective in the Basin Plan
1,1-Dichloroethylene	< 0.5	0.6	US EPA Health Advisory applied to the TOXICITY water quality objective in the Basin Plan
Trichlorotrifluoroethane	< 0.5	0.19	US EPA National Ambient Water Quality Criteria, One-in-a-Million Cancer Risk Estimate, Sources of Drinking Water (Water & Fish consumption) applied to TOXICITY water quality objective in the Basin Plan
1,1,1-Trichloroethane	< 0.5	200	California Department of Health Services Maximum Contaminant Level applied to the TOXICITY water quality objective in the Basin Plan
Trichloromethane	< 0.5	1.1	Cal/EPA Cancer Potency Factor applied to TOXICITY water quality objective in the Basin Plan
Bromodichloromethane	< 0.5	0.27	Cal/EPA Cancer Potency Factor applied to TOXICITY water quality objective in the Basin Plan

<sup>3</sup> Practical quantitation limits are based on current technology. For instances where technology cannot achieve the water quality objective the practical quantitation limit will be used.

<b>Constituent of Concern</b>	<b>Practical Quantitation Limit ug/l</b>	<b>Water Quality Objective<sup>3</sup> ug/l</b>	<b>Reference for Objective</b>
Acetone	< 0.5	6300	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to TOXICITY water quality objective in the Basin Plan
Methyl t-Butyl Ether	< 0.5	5	California Department of Health Services Secondary Maximum Contaminant Level applied to the TASTE AND ODOR water quality objective in the Basin Plan
1,2,4-Trimethylbenzene	< 0.5	330	California Department of Health Services Notification Level applied to TOXICITY water quality objective in the Basin Plan
1,3,5-Trimethylbenzene	< 0.5	15	Published literature provides a taste and odor threshold of 15 ug/l which is applied to the narrative TASTE AND ODOR water quality objective of the Basin Plan
sec-Butylbenzene	< 0.5	260	California Department of Health Services Notification Level applied to TOXICITY water quality objective in the Basin Plan
tert-Butylbenzene	< 0.5	260	California Department of Health Services Notification Level applied to TOXICITY water quality objective in the Basin Plan
n-Propylbenzene	< 0.5	260	California Department of Health Services Notification Level applied to TOXICITY water quality objective in the Basin Plan
n-Butylbenzene	< 0.5	260	California Department of Health Services Notification Level applied to TOXICITY water quality objective in the Basin Plan
Isopropylbenzene (Cumene)	< 0.5	0.8	Published literature provides a taste and odor threshold of 0.8 ug/l which is applied to the narrative TASTE AND ODOR water quality objective of the Basin Plan
4-isopropyl Toluene	< 0.5	None available	
Vinyl Chloride	< 0.5	0.05	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to TOXICITY water quality objective in the Basin Plan
Pentachlorophenol	< 0.2	0.27	California Toxics Rule Criteria, Inland Surface Waters, Human Health Protection, Sources of Drinking Water (water & fish consumption) applied to

Constituent of Concern	Practical Quantitation Limit ug/l	Water Quality Objective <sup>3</sup> ug/l	Reference for Objective
			TOXICITY water quality objective in the Basin Plan
2, 3, 4, 6-Tetrachlorophenol	< 0.2	1.0	US EPA National Ambient Water Quality Criteria, Human Health and Welfare Protection applied to TASTE AND ODOR water quality objective in the Basin Plan.
2, 4, 5-Trichlorophenol	< 0.2	1.0	US EPA National Ambient Water Quality Criteria, Human Health and Welfare Protection applied to TASTE AND ODOR water quality objective in the Basin Plan.
2, 4, 6-Trichlorophenol	< 0.2	0.5	Cal/EPA Cancer Potency Factor applied to TOXICITY water quality objective in the Basin Plan
Methanol	< 50	3500	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to TOXICITY water quality objective in the Basin Plan
Phenylmercuric Acetate	< 0.2	0.6	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to TOXICITY water quality objective in the Basin Plan
Gasoline	< 50	5.0	Published literature provides a taste and odor threshold of 5 ug/l which is applied to the narrative TASTE AND ODOR water quality objective of the Basin Plan
Diesel	< 50	56	US EPA health advisory of September 4, 1992, Suggested No Adverse Response Level (SNARL) applied to TOXICITY water quality objective in the Basin Plan
Motor Oil	< 175	100	US EPA health advisory Suggested No Adverse Response Level (SNARL) of 0.1 ug/l to 1.0 ug/l applied to TOXICITY water quality objective in the Basin Plan
Furan	< 0.0001	7.0	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to TOXICITY water quality objective in the Basin Plan

Constituent of Concern	Practical Quantitati on Limit ug/l	Water Quality Objective <sup>3</sup> ug/l	Reference for Objective
2,3,7,8-TCDD (Dioxin) <sup>4</sup>	< 0.0001	1.3 E-8	US EPA National Ambient Water Quality Criteria, One-in-a-Million Cancer Risk Estimate, Sources of Drinking Water (water & organisms) applied to TOXICITY water quality objective in the Basin Plan
Benzene	< 0.5	0.15	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to TOXICITY water quality objective in the Basin Plan
Toluene	< 0.5	40	US EPA Secondary Maximum Contaminant Level, applied to TASTE AND ODOR water quality objective in the Basin Plan
Ethylbenzene	< 0.5	3.2	Cal/EPA Cancer Potency Factor applied to TOXICITY water quality objective in the Basin Plan
Xylenes	< 0.5	17	US EPA Secondary Maximum Contaminant Level, applied to TASTE AND ODOR water quality objective in the Basin Plan
Acenaphthene	< 0.1	20	US EPA National Ambient Water Quality Criteria, Human Health and Welfare Protection applied to TASTE AND ODOR water quality objective in the Basin Plan.
Anthracene	< 0.1	2100	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to

<sup>4</sup> Toxicity equivalency factors (TEF) are used to determine the relative toxicity of chlorinated dibenzodioxin (CDD) and chlorinated dibenzofuran (CDF) congeners. The following table represents applicable isomer groups and their associated TEF.

Isomer Group	Toxicity Equivalence Factor	Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0	2,3,7,8 tetra CDF	0.1
2,3,7,8-penta CDD	0.5	1,2,3,7,8 penta CDF	0.05
2,3,7,8-hexa CDD	0.1	2,3,4,7,8 penta CDF	0.5
2,3,7,8-hepta CDD	0.01	2,3,7,8 hexa CDF	0.1
octa CDD	0.001	2,3,7,8 hepta CDF	0.01
		octa CDF	0.001

Constituent of Concern	Practical Quantitation Limit ug/l	Water Quality Objective <sup>3</sup> ug/l	Reference for Objective
			TOXICITY water quality objective in the Basin Plan
Benz(a)Anthracene	< 0.1	0.0044	California Toxics Rule Criteria, Inland Surface Waters, Human Health Protection (water & fish consumption) applied to TOXICITY water quality objective in the Basin Plan
Benzo(b)Fluoranthene	< 0.1	0.0044	California Toxics Rule Criteria, Inland Surface Waters, Human Health Protection (water & fish consumption) applied to TOXICITY water quality objective in the Basin Plan
Benzo(k)Fluoranthene	< 0.1	0.0044	US EPA National Ambient Water Quality Criteria, One-in-a-Million Cancer Risk Estimate, Sources of Drinking Water (water & organisms) applied to TOXICITY water quality objective in the Basin Plan
Benzo(a)Pyrene	< 0.1	0.0029	Cal/EPA Cancer Potency Factor applied to TOXICITY water quality objective in the Basin Plan
Chrysene	< 0.1	0.0044	California Toxics Rule Criteria, Inland Surface Waters, Human Health Protection (water & fish consumption) applied to TOXICITY water quality objective in the Basin Plan
Dibenz(a,h)Anthracene	< 0.1	0.0044	California Toxics Rule Criteria, Inland Surface Waters, Human Health Protection (water & fish consumption) applied to TOXICITY water quality objective in the Basin Plan
Fluoranthene	< 0.1	280	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to TOXICITY water quality objective in the Basin Plan
Fluorene	< 0.1	280	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to TOXICITY water quality objective in the Basin Plan
Indeno(1,2,3-c,d)Pyrene	< 0.1	0.0044	California Toxics Rule Criteria, Inland Surface Waters, Human Health Protection (water & fish consumption) applied to

Constituent of Concern	Practical Quantitation Limit ug/l	Water Quality Objective <sup>3</sup> ug/l	Reference for Objective
			TOXICITY water quality objective in the Basin Plan
Naphthalene	< 1.0	140	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to TOXICITY water quality objective in the Basin Plan
Phenol	< 1.0	2100	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to TOXICITY water quality objective in the Basin Plan
Pyrene	< 0.1	210	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to TOXICITY water quality objective in the Basin Plan
Arsenic	< 1.0	0.0037	Cal/EPA Cancer Potency Factor applied to TOXICITY water quality objective in the Basin Plan
Barium	< 2.0	1000	California Department of Health Services Maximum Contaminant Level applied to the TOXICITY water quality objective in the Basin Plan
Cadmium	< 0.25	0.80	California Toxics Rule Criteria, Inland Surface Waters, Freshwater Aquatic Protection, Continuous Concentration (4-day Average) applied to TOXICITY water quality objective in the Basin Plan. Concentration shown based on CaCO <sub>3</sub> concentration of 25 mg/l. Actual water quality objective varies with CaCO <sub>3</sub> concentration of receiving water
Chromium (Total)	< 0.5	50	California Department of Health Services Maximum Contaminant Level applied to the TOXICITY water quality objective in the Basin Plan
Chromium (IV)	< 2.0	21	US EPA Integrated Risk Information System (IRIS) Reference Dose applied to TOXICITY water quality objective in the Basin Plan
Copper	< 0.5	2.7	California Toxics Rule Criteria, Inland Surface Waters, Freshwater Aquatic Protection, Continuous Concentration (4-day Average) applied to TOXICITY water

Constituent of Concern	Practical Quantitation Limit ug/l	Water Quality Objective <sup>3</sup> ug/l	Reference for Objective
			quality objective in the Basin Plan. Concentration shown based on CaCO <sub>3</sub> concentration of 25 mg/l. Actual water quality objective varies with CaCO <sub>3</sub> concentration of receiving water
Iron	< 2.0	300	California Department of Health Services Secondary Maximum Contaminant Level applied to the TASTE & ODOR water quality objective in the Basin Plan
Lead	< 0.5	0.54	California Toxics Rule Criteria, Inland Surface Waters, Freshwater Aquatic Protection, Continuous Concentration (4-day Average) applied to TOXICITY water quality objective in the Basin Plan. Concentration shown based on CaCO <sub>3</sub> concentration of 25 mg/l. Actual water quality objective varies with CaCO <sub>3</sub> concentration of receiving water
Manganese	< 2.0	50	California Department of Health Services Secondary Maximum Contaminant Level applied to the TASTE & ODOR General water quality objective in the Basin Plan
Mercury	< 0.5	1.2	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to TOXICITY water quality objective in the Basin Plan
Nickel	< 1.0	12	California Public Health Goal (PHG) in Drinking Water (Office of Environmental Health Hazard Assessment) applied to TOXICITY water quality objective in the Basin Plan
Zinc	< 2.0	36	California Toxics Rule Criteria, Inland Surface Waters, Freshwater Aquatic Protection, Continuous Concentration (4-day Average) applied to TOXICITY water quality objective in the Basin Plan. Concentration shown based on CaCO <sub>3</sub> concentration of 25 mg/l. Actual water quality objective varies with CaCO <sub>3</sub> concentration of receiving water
Phenanthrene	<0.1	None available	

<b>Constituent of Concern</b>	<b>Practical Quantitation Limit ug/l</b>	<b>Water Quality Objective<sup>3</sup> ug/l</b>	<b>Reference for Objective</b>
1,1 Dichloroethane	<0.5	None available	
1,2 Dichloroethane	<0.5	0.38	California Toxics Rule Criteria, Inland Surface Waters, Human Health Protection, Sources of Drinking Water (water & fish consumption) applied to TOXICITY water quality objective in the Basin Plan
1,2 Dichloroethane	<0.5	99	California Toxics Rule Criteria, Inland Surface Waters, Human Health Protection (30-day Average, fish consumption) applied to TOXICITY water quality objective in the Basin Plan
1,1,2 Trichloroethane	<0.5	0.3	California PHG in Drinking Water (Office of Environmental Health Hazard Assessment) applied to TOXICITY water quality objective in the Basin Plan
1,1,2 Trichloroethane	<0.5	0.6	California Toxics Rule Criteria, Inland Surface Waters, Human Health Protection, Sources of Drinking Water (water & fish consumption) applied to TOXICITY water quality objective in the Basin Plan
1,1,2 Trichloroethane	<0.5	42	California Toxics Rule Criteria, Inland Surface Waters, Human Health Protection (30-day Average, fish consumption) applied to TOXICITY water quality objective in the Basin Plan