

Final California 2010 Integrated Report(303(d) List/305(b) Report)

Supporting Information

Regional Board 5 - Central Valley Region

Water Body Name: [Sacramento River \(Knights Landing to the Delta\)](#)
Water Body ID: CAR510000020021210114330
Water Body Type: River & Stream

DECISION ID 4158

Region 5

Sacramento River (Knights Landing to the Delta)

Pollutant: Diazinon
Final Listing Decision: Delist from 303(d) list (being addressed by USEPA approved TMDL)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (being addressed by USEPA approved TMDL)(2006)
Revision Status Revised
Reason for Delisting: State determines water quality standard is being met
TMDL Name: Sacramento and Feather River Diazinon TMDL
TMDL Project Code: 83
Date TMDL Approved by USEPA: 01/01/2003
Impairment from Pollutant or Pollution: Pollutant

Conclusion: This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. Two samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 359 available 4-day average concentrations exceeded the 4-day average maximum concentration criterion and this does not exceed the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Board Staff Decision: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

SWRCB Board Staff Decision: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

USEPA Action (if applicable):

**Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22837
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	169
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	193 Water samples were collected from Sacramento River from December 2005 through December 2007, representing 169 4-day average concentrations and 193 1-hour average concentrations. 0 of 169 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.10 ug/L. 0 of 193 available 1-hour average concentrations exceeded the maximum 1-hour concentration of 0.16 ug/L.
Data Reference:	Zipped file of Central Valley Waterways Pesticide TMDL monitoring data spreadsheets and reports
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Fish and Game Hazard Assessment Criteria - 0.160 ug/L 1-hour average and 0.100 ug/L 4-day average concentration not to be exceeded more than once every three years (Siepmann and Finlayson, 2000 and Finlayson, 2004).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at Free Port.
Temporal Representation:	Samples were collected at variable intervals (daily during storm events, and weekly during non-storms) from December 2005 through December 2007
Environmental Conditions:	
QAPP Information:	Data quality: Good. Calanchini, H. 2006. Quality Assurance Project Plan, Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. John Muir Institute of the Environment, U.C. Davis. Davis, CA.
QAPP Information Reference(s):	Quality Assurance Project Plan. Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus

[Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. Final. SWAMP Project ID 02TM5001 \(Revision 0.0\). John Muir Institute of the Environment, U.C. Davis, Davis, CA. January 26, 2006](#)

**Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22823
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	26 water sample was collected from Sacramento River between July 1999 and May 2002, representing 26 4-day average concentrations and 26 one-hour average concentrations. 0 of 26 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.1 ug/L. 0 of 26 available 1-hour average concentrations exceeded the maximum 1-hour concentration of 0.16 ug/L.
Data Reference:	Sacramento River watershed program (SRWP) water quality database 1991-2003. Davis, CA
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Fish and Game Hazard Assessment Criteria - 0.160 ug/L 1-hour average and 0.100 ug/L 4-day average concentration not to be exceeded more than once every three years (Siepmann and Finlayson, 2000 and Finlayson, 2004).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at Veterans Bridge
Temporal Representation:	Samples were collected between July 1999 and May 2002 at variable intervals (e.g. bi-monthly, monthly).
Environmental Conditions:	
QAPP Information:	Monitoring was conducted in accordance with the Quality Assurance Project Plan for Monitoring prepared for the Sacramento River Watershed Program (SRWP 1999a, 1999b, 2000b, 2001b, 2002b, 2003b, 2006).
QAPP Information Reference(s):	

**Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22809
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	9 water samples were collected from Sacramento River from January through March 2006, representing 6 4-day average concentrations and 9 1-hour average concentrations. 0 of 6 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.1 ug/L. 0 of 9 available 1-hour average concentrations exceeded the maximum 1-hour concentration of 0.16 ug/L.
Data Reference:	Zipped file of Central Valley Waterways Pesticide TMDL monitoring data spreadsheets and reports
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Fish and Game Hazard Assessment Criteria - 0.160 ug/L 1-hour average and 0.100 ug/L 4-day average concentration not to be exceeded more than once every three years (Siepmann and Finlayson, 2000 and Finlayson, 2004).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at Alamar Marina Dock.
Temporal Representation:	Sample was collected one sample in January 2006, two samples in February, and six samples in March 2006 at daily during storm.
Environmental Conditions:	
QAPP Information:	Calanchini, H. 2006. Quality Assurance Project Plan, Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. John Muir Institute of the Environment, U.C. Davis. Davis, CA.
QAPP Information Reference(s):	Quality Assurance Project Plan. Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface

[Waters. Final. SWAMP Project ID 02TM5001 \(Revision 0.0\). John Muir Institute of the Environment, U.C. Davis. Davis, CA. January 26, 2006](#)

**Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22808
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	27 water samples were collected from Sacramento River in February 2005, representing 17 4-day average concentrations and 27 1-hour average concentrations. 0 of 17 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.1 ug/L. 0 of 27 available 1-hour average concentrations exceeded the maximum 1-hour concentration of 0.16 ug/L.
Data Reference:	Zipped file of Central Valley Waterways Pesticide TMDL monitoring data spreadsheets and reports
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Fish and Game Hazard Assessment Criteria - 0.160 ug/L 1-hour average and 0.100 ug/L 4-day average concentration not to be exceeded more than once every three years (Siepmann and Finlayson, 2000 and Finlayson, 2004).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at two locations: Tower Bridge and Veterans Bridge.
Temporal Representation:	Samples were collected daily in February 2005 in two storms from two locations.
Environmental Conditions:	
QAPP Information:	Calanchini, H. 2006. Quality Assurance Project Plan, Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. John Muir Institute of the Environment, U.C. Davis. Davis, CA.
QAPP Information Reference(s):	Quality Assurance Project Plan. Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface

[Waters. Final. SWAMP Project ID 02TM5001 \(Revision 0.0\). John Muir Institute of the Environment, U.C. Davis. Davis, CA. January 26, 2006](#)

**Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22806
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	26 water samples were collected from Sacramento River from January through February 2003, representing 17 4-day average concentrations and 26 1-hour average concentrations. 0 of 17 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.1 ug/L. 0 of 26 available 1-hour average concentrations exceeded the maximum 1-hour concentration of 0.16 ug/L.
Data Reference:	Zipped file of Central Valley Waterways Pesticide TMDL monitoring data spreadsheets and reports
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Fish and Game Hazard Assessment Criteria - 0.160 ug/L 1-hour average and 0.100 ug/L 4-day average concentration not to be exceeded more than once every three years (Siepmann and Finlayson, 2000 and Finlayson, 2004).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at Tower Bridge.
Temporal Representation:	Samples were collected daily during two storm events.
Environmental Conditions:	
QAPP Information:	Calanchini, H. 2006. Quality Assurance Project Plan, Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. John Muir Institute of the Environment, U.C. Davis. Davis, CA.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 4158, Diazinon

Region 5

Sacramento River (Knights Landing to the Delta)

LOE ID:	2587
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1089
Number of Exceedances:	25
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Out of 1,089 samples, 15 were considered to be of questionable quality and therefore were not used as part of this assessment. Of the remaining 1,075 samples, there were 11 that exceeded the acute criteria and 14 additional samples exceeded the chronic criteria (Dileanis et al., 2002; Dileanis, 2003a; Dileanis 2003b; Dileanis 2003c; Domagalski, 2000; Gill, 2002; LWA, 1996; LWA, 2002a; LWA, 2002b; MacCoy et al., 1995; Nordmark et al., 1998a; Nordmark, 1998; Nordmark, 1999; Nordmark, 2000).
Data Reference:	Placeholder reference 2006 303(d)
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	CDFG Hazard Assessment Criteria 0.16 ug/L 1-hour average (acute), 0.10 ug/L 4-day average (chronic) (Siepman & Finlayson, 2000; Finlayson, 2004).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Alamar, Bryte, Freeport, Sacramento, River Mile 44, and Verona.
Temporal Representation:	Samples were taken from 1995 through 2001; samples at Sacramento began in 1992.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)

Region 5

LOE ID:	2586
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	34
Number of Exceedances:	1

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Thirty-four samples were taken; 1 sample exceeded both the acute and chronic CDFG criteria.
Data Reference:	Placeholder reference 2006 303(d)
Water Quality Objective/Criterion:	Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies (see State Water Resources Control Board Resolution No. 68-16 and 40 C.F.R. Section 131.12). No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	CDFG Hazard Assessment Criteria 0.16 ug/L 1-hour average (acute), 0.10 ug/L 4-day (chronic) average (Siepmann & Finlayson, 2000; Finlayson, 2004).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Monitoring sites included the Sacramento River at Tower Bridge and Sacramento River at Veterans Bridge. Sampling frequency for each storm event was one sample/day was taken for 7 days. At the Tower Bridge site two additional days of sampling were performed during the first storm event because ELISA (Enzyme-Linked Immunosorbent Assay) tests indicated a continuing presence of diazinon in the water. These two samples (5 and 6 February) were collected using a 3L PTFE bottle lowered by line from three equally spaced points across the channel width. On 2 and 3 February, for sampling at Veterans Bridge a single grab sample was collected from the bank at each site. Isokinetic, depth integrated water samples were collected at 6-10 equally spaced points across the channel width with a USGS D-77 sampler using the equal-width-increment method (EWI). Samples were collected from a boat at three sites (Sacramento River at Veterans Bridge, Feather River near Nicolaus/Verona and Sacramento Slough) and from a bridge at one site (Sacramento River at Tower Bridge).
Temporal Representation:	Two storm events were sampled for the 2004 TMDL project in the Sacramento River Basin. The first storm event (Storm 1) was the period, 28 January to 6 February, 2004. The second storm event (Storm 2) was the period 15-23 February, 2004. For storm 1 sampling was conducted from 28 January to 3 February at most sites, and as late as 6 February at the Tower Bridge at Sacramento site. For storm 2 the sampling period began on 16 February and extended until 22 February at most sites, and through 23 February at the Sacramento River at Veterans Bridge and Sacramento River at Tower Bridge sites.
Environmental Conditions:	
QAPP Information:	Sample quality control was measured through collection of sequential duplicates (n=8), blanks (n=5) and matrix spikes (n=5). The relative percent difference (RPD) between environmental and duplicate sample concentrations of chlorpyrifos ranged from 0-104%. The RPDs between environmental and duplicate sample concentrations of diazinon ranged from 0-40%.
QAPP Information Reference(s):	

**Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22836
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water

Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	17 water sample was collected from Sacramento River between April 2006 and August 2007, representing 17 4-day average concentrations and 17 one-hour average concentrations. 1 of 10 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.1 ug/L. 0 of 10 available 1-hour average concentrations exceeded the maximum 1-hour concentration of 0.16 ug/L.
Data Reference:	Sacramento River watershed program (SRWP) water quality database 1991-2003. Davis, CA
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Fish and Game Hazard Assessment Criteria - 0.160 ug/L 1-hour average and 0.100 ug/L 4-day average concentration not to be exceeded more than once every three years (Siepmann and Finlayson, 2000 and Finlayson, 2004).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at Veterans Bridge
Temporal Representation:	Samples were collected between between April 2006 and August 2007 at variable intervals (e.g. bi-weekly, monthly).
Environmental Conditions:	
QAPP Information:	Data quality: Excellent. Monitoring was conducted in accordance with the Quality Assurance Project Plan for Monitoring prepared for the Sacramento River Watershed Program (SRWP 1999a, 1999b, 2000b, 2001b, 2002b, 2003b, 2006).
QAPP Information Reference(s):	Quality Assurance Project Plan (QAPP), Sacramento Valley Water Quality Coalition. Diazinon Runoff Management Plan for Orchard Growers in the Sacramento Valley

**Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22822
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	10 water samples were collected from Sacramento River from December 2004 to February 2005, representing 5 4-day average concentrations and 10 1-hour average concentrations. 0 of 5 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.10 ug/L. 0 of 10 available 1-hour average concentrations exceeded the maximum 1-hour concentration of 0.16 ug/L.
Data Reference:	Report and data files for pesticides in the Sacramento River, Winter 2005
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Fish and Game Hazard Assessment Criteria - 0.160 ug/L 1-hour average and 0.100 ug/L 4-day average concentration not to be exceeded more than once every three years (Siepmann and Finlayson, 2000 and Finlayson, 2004).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at Alamar marina Dock
Temporal Representation:	One sample was collected on 12/4/2004, and the other samples were collected once or twice a day from 1/26/200-2/1/2005.
Environmental Conditions:	
QAPP Information:	All sampling, analysis and QA/QC protocols are described in Guo and Kelley, 2004.
QAPP Information Reference(s):	Standard Operating Procedure for Conducting Surface Water Monitoring for Pesticides

**Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22821
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat

Number of Samples:	76
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	90 Water samples were collected from Sacramento River from January 2000 through May 2002, representing 76 4-day average concentrations and 90 1-hour average concentrations. 0 of 76 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.10 ug/L. 0 of 90 available 1-hour average concentrations exceeded the maximum 1-hour concentration of 0.16 ug/L.
Data Reference:	Surface Water database (SWDB) for Central Valley waterbodies, 2000-2005 Correspondence between the Department of Pesticide Regulation and Central Valley Regional Water Quality Control Board regarding water quality data for waterbodies in the Central Valley
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Fish and Game Hazard Assessment Criteria - 0.160 ug/L 1-hour average and 0.100 ug/L 4-day average concentration not to be exceeded more than once every three years (Siepmann and Finlayson, 2000 and Finlayson, 2004).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at two locations: Alamar marina Dock and Veterans Bridge.
Temporal Representation:	Samples were collected daily during two storms from January 2000 through May 2002.
Environmental Conditions:	
QAPP Information:	Minimum requirements for the CDPR Surface Water Database are: Name of the sampling agency or organization, Date that each sample was collected, Date of each sample analysis, County where samples were taken, Detailed sampling location information (including latitude and longitude or township/range/section if available), detailed map or description of each sampling site (i.e., address, cross roads, etc.), Name or description of water body sampled, Name of the active ingredient analyzed for; concentration detected (with unit of measurement), and limit of quantitation, Description of analytical QA/QC plan, or statement that no formal plan exists. Additional optional requirements are included on DPR's webpage at http://www.cdpr.ca.gov/docs/emon/surfwttr/caps/req.htm
QAPP Information Reference(s):	Standard Operating Procedure for Conducting Surface Water Monitoring for Pesticides

**Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22807
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	37 water samples were collected from Sacramento River from January through February 2004, representing 23 4-day average concentrations and 37 1-hour average concentrations. 0 of 23 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.1 ug/L. 1 of 37 available 1-hour average concentrations exceeded the maximum 1-hour concentration of 0.16 ug/L.
Data Reference:	Zipped file of Central Valley Waterways Pesticide TMDL monitoring data spreadsheets and reports
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Fish and Game Hazard Assessment Criteria - 0.160 ug/L 1-hour average and 0.100 ug/L 4-day average concentration not to be exceeded more than once every three years (Siepmann and Finlayson, 2000 and Finlayson, 2004).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at two locations: Tower Bridge and Veterans Bridge.
Temporal Representation:	Samples were collected daily during two storm events at two locations.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Calanchini, H. 2006. Quality Assurance Project Plan, Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. John Muir Institute of the Environment, U.C. Davis. Davis, CA.
QAPP Information Reference(s):	Quality Assurance Project Plan. Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. Final. SWAMP Project ID 02TM5001 (Revision 0.0). John Muir Institute of the Environment, U.C. Davis. Davis, CA. January 26, 2006

**Line of Evidence (LOE) for Decision ID 4158, Diazinon
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22824
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	10 water samples were collected from Sacramento River between October 2002 and August 2004, representing 10 4-day average concentrations and 10 one-hour average concentrations. 1 of 10 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.1 ug/L. 0 of 10 available 1-hour average concentrations exceeded the maximum 1-hour concentration of 0.16 ug/L.
Data Reference:	Sacramento River watershed program (SRWP) water quality database 1991-2003. Davis, CA
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit. Office of Spills and Response. CA Department of Fish and Game Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Fish and Game Hazard Assessment Criteria - 0.160 ug/L 1-hour average and 0.100 ug/L 4-day average concentration not to be exceeded more than once every three years (Siepmann and Finlayson, 2000 and Finlayson, 2004).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit. Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at Veterans Bridge
Temporal Representation:	Samples were collected between July 1999 and May 2002 at variable intervals (e.g. bi-monthly, monthly).
Environmental Conditions:	
QAPP Information:	Monitoring was conducted in accordance with the Quality Assurance Project Plan for Monitoring prepared for the Sacramento River Watershed Program (SRWP 1999a, 1999b, 2000b, 2001b, 2002b, 2003b, 2006).
QAPP Information Reference(s):	

DECISION ID 7160
Sacramento River (Knights Landing to the Delta)

Region 5

Pollutant: Unknown Toxicity
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)

Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2006)
Revision Status: Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Conclusion: This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Six lines of evidence are available in the administrative record to assess pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 42 samples tested with Ceriodaphnia (survival or reproductive toxicity) exceeded the narrative toxicity objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Two of 30 samples tested with Pimephales (survival or reproductive toxicity) exceeded the narrative toxicity objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
5. Zero of 19 samples tested with Selenastrum exceeded the water quality objective and this does not exceed the allowable frequency listed in Table 4.1 of the Listing Policy. According to Table 4.1 of the Listing Policy, for a sample size of 91, delisting is indicated if the number of exceedances is equal to or is less than 7.
6. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

RWQCB Board Staff Decision: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

SWRCB Board Staff Decision: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

USEPA Action (if applicable): USEPA approved the listing of this water body as a water quality limited segment requiring a TMDL for this pollutant.

**Line of Evidence (LOE) for Decision ID 7160, Unknown Toxicity
 Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID: 22826

Pollutant: Toxicity
 LOE Subgroup: Toxicity
 Matrix: Water
 Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 42
 Number of Exceedances: 2

Data and Information Type: TOXICITY TESTING

Data Used to Assess Water Quality: Seven-day survival toxicity tests were conducted with *Ceriodaphnia dubia* in association with Sacramento River Watershed Program. Two of the 42 samples exhibited a significant increase in mortality compared to the laboratory control and violated the narrative toxicity objective. The following is a summary of toxicity test results by year.

1998-1999: None of the 12 samples exhibited a significant increase in mortality compared to the laboratory control.

1999-2000: None of the 12 samples exhibited a significant increase in mortality compared to the laboratory control.

2000-2001: This site was not included in the 2000-2001 monitoring activities.

2001-2002: This site was not included in the 2001-2002 monitoring activities.

2002-2003: This site was not included in the 2002-2003 monitoring activities.

2003-2004: This site was not included in the 2003-2004 monitoring activities.

2006-2007: Two of the 18 samples exhibited a significant increase in mortality compared to the laboratory control. The toxic samples were collected on the following dates (survival reported as a percentage of control response is included in parentheses): 12 December 2006 (0) and 6 June 2007 (0). It should be noted that of the 12 water samples collected from across the watershed during this sampling event (December 2006), 11 caused complete mortality of the test organisms in the initial test. Phase I Toxicity Identification Evaluations (TIEs) were conducted using the 12 December 2006 sample. Although persistent during the TIEs, the toxicity was delayed and its magnitude was decreased. Toxicity was removed by the following TIE treatments: C-8 solid phase extraction, chelex column extraction, and piperonyl butoxide (PBO). This suggests that dissolved non-polar organic contaminants, divalent cations, and metabolically-activated substances, or a substance with all of these properties, caused the toxicity (SRWP 2008). A Phase I TIE was also conducted for the 6 June 2007 sample; however, the toxicity was not persistent.

Data Reference: [Sacramento River watershed program \(SRWP\) water quality database 1991-2003. Davis, CA](#)

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. (CVRWQCB, 2007).

Objective/Criterion Reference: [Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed](#)

Evaluation Guideline: Statistically significant difference from control with 7-day survival toxicity tests. Significant toxicity is defined as mortality (>20%) that is statistically different from controls at the 95% confidence level.

Guideline Reference: [Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition. U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-821-R-02-013](#)

Spatial Representation: Samples were collected from the Sacramento River at Veterans Bridge.

Temporal Representation: 1998 - 1999: Samples were collected monthly from June 1998 through May 1999.
 1999 - 2000: Samples were collected on a monthly basis from June 1999 through May 2000.
 2006 - 2007: Sampling was generally conducted on a monthly basis from April 2006 through August 2007.

Environmental Conditions:

QAPP Information: Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan for Monitoring prepared for the Sacramento River Watershed Program (SRWP 1999a, 1999b, 2000b, 2001b, 2002b, 2003b, 2006).

QAPP Information Reference(s):

**Line of Evidence (LOE) for Decision ID 7160, Unknown Toxicity
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID: 4517

Pollutant: Unknown Toxicity

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Not Recorded

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 0

Number of Exceedances: 0

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.

Data Reference: [Placeholder reference pre-2006 303\(d\)](#)

Water Quality Objective/Criterion: Unspecified

Objective/Criterion Reference: [Placeholder reference pre-2006 303\(d\)](#)

Evaluation Guideline: Unspecified

Guideline Reference: [Placeholder reference pre-2006 303\(d\)](#)

Spatial Representation: Unspecified

Temporal Representation: Unspecified

Environmental Conditions: Unspecified

QAPP Information: Unspecified

QAPP Information Reference(s):

**Line of Evidence (LOE) for Decision ID 7160, Unknown Toxicity
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID: 22842

Pollutant: Toxicity

LOE Subgroup: Toxicity

Matrix: Water

Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 19

Number of Exceedances: 0

Data and Information Type: TOXICITY TESTING

Data Used to Assess Water Quality: Four-day growth tests were conducted with *Selenastrum capricornutum* in association with Sacramento River Watershed Program. None of the 19 samples

exhibited a significant decrease in growth as compared to the laboratory control and violated the narrative toxicity objective. The following is a summary of monitoring results by year. 1999-2000A single sample was collected on 21 September 1999. The sample did not exhibit a significant decrease in growth (cell numbers) as compared to the laboratory control. 2006-2007None of the 18 samples exhibited a significant decrease in growth as compared to the laboratory control. The results reported for the sample collected on 25 July 2006 were those of a re-test (SRWP 2008).

Data Reference:

[Sacramento River watershed program \(SRWP\) water quality database 1991-2003. Davis, CA](#)

Water Quality Objective/Criterion:

All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. (CVRWQCB, 2007).

Objective/Criterion Reference:

[Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed](#)

Evaluation Guideline:

Statistically significant difference from control with a short-term chronic (4-day) growth test.

Guideline Reference:

[Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition, U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-821-R-02-013](#)

Spatial Representation:

Samples were collected from the Sacramento River at Veterans Bridge.

Temporal Representation:

1999 - 2000: A single sample was collected on 21 September 1999.

2006 - 2007: Sampling was generally conducted on a monthly basis from April 2006 through August 2007.

Environmental Conditions:

QAPP Information:

Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan for Monitoring prepared for the Sacramento River Watershed Program (SRWP 1999a, 1999b, 2000b, 2001b, 2002b, 2003b, 2006).

QAPP Information Reference(s):

**Line of Evidence (LOE) for Decision ID 7160, Unknown Toxicity
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:

26223

Pollutant:

Toxicity

LOE Subgroup:

Toxicity

Matrix:

Water

Fraction:

Total

Beneficial Use:

Warm Freshwater Habitat

Number of Samples:

30

Number of Exceedances:

1

Data and Information Type:

TOXICITY TESTING

Data Used to Assess Water Quality:

Seven-day survival toxicity tests were conducted with *Pimephales promelas*. One of the 30 samples exhibited a significant increase in mortality compared to the laboratory control and violated the narrative toxicity objective. The following is a summary of the test results by year.
1998-1999: None of the 12 samples exhibited a significant increase in mortality

compared to the laboratory control.

1999-2000: This site was not included in the 1999-2000 monitoring activities.

2000-2001: This site was not included in the 2000-2001 monitoring activities.

2001-2002: This site was not included in the 2001-2002 monitoring activities.

2002-2003: This site was not included in the 2002-2003 monitoring activities.

2003-2004: This site was not included in the 2003-2004 monitoring activities.

2006-2007: One of the 18 samples exhibited a significant increase in mortality compared to the laboratory control. The toxic sample (survival reported as a percentage of control response is provided in the parentheses) was collected on 12 December 2006 (55).

Data Reference:

[Sacramento River watershed program \(SRWP\) water quality database 1991-2003. Davis, CA](#)

Water Quality Objective/Criterion:

All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances (CVRWQCB, 2007).

Objective/Criterion Reference:

[Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed](#)

Evaluation Guideline:

Statistically significant difference from control with 7-day survival toxicity tests. Significant toxicity is defined as a statistically significant ($p < 0.5$) increase in mortality (>20%) compared to the laboratory control.

Guideline Reference:

[Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition. U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-821-R-02-013](#)

Spatial Representation:

All samples were collected from the Sacramento River at Veterans Bridge.

Temporal Representation:

1998-1999: Samples collected monthly from June 1998 through May 1999.

2006-2007: Sampling was generally conducted on a monthly basis from April 2006 through August 2007.

Environmental Conditions:

QAPP Information:

Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan for Monitoring prepared for the Sacramento River Watershed Program (SRWP 1999a, 1999b, 2003, 2006). The test results reported for 20 September 2006 were those of a re-test (SRWP 2008). The test organisms in the site water collected on 25 April 2007 exhibited ?pathogen-related mortalities? and were excluded from evaluation of ambient toxicity (SRWP 2008). The 25 April 2007 sampling event was not included in this assessment.

QAPP Information Reference(s):

**Line of Evidence (LOE) for Decision ID 7160, Unknown Toxicity
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID: 26222

Pollutant: Toxicity

LOE Subgroup: Toxicity

Matrix: Water

Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 30

Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	<p>Seven-day growth toxicity tests were conducted with <i>Pimephales promelas</i>. One of the 30 samples exhibited significant reduction in growth compared to the laboratory control and violated the narrative toxicity objective. Growth endpoints for <i>P. promelas</i> were not statistically compared to control results if survival endpoints were significantly less than the controls. The following is a summary of the test results by year.</p> <p>1998-1999: None of the 12 samples exhibited significant reduction in growth compared to the laboratory control.</p> <p>1999-2000: This site was not included in the 1999-2000 monitoring activities.</p> <p>2000-2001: This site was not included in the 2000-2001 monitoring activities.</p> <p>2001-2002: This site was not included in the 2001-2002 monitoring activities.</p> <p>2002-2003: This site was not included in the 2002-2003 monitoring activities.</p> <p>2003-2004: This site was not included in the 2003-2004 monitoring activities.</p> <p>2006-2007: One of the 18 samples exhibited significant reduction in growth compared to the laboratory control. The toxic sample was collected on 14 March 2007 (73% of control).</p>
Data Reference:	Sacramento River watershed program (SRWP) water quality database 1991-2003. Davis, CA
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	Statistically significant difference from control with 7-day growth toxicity tests. Significant toxicity is defined as a statistically significant ($p < 0.5$) reduction in growth compared to the laboratory control.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-821-R-02-013
Spatial Representation:	All samples were collected from the Sacramento River at Veterans Bridge.
Temporal Representation:	1998 -1999: Samples were collected monthly from June 1998 through May 1999. 2006-2007: Sampling was generally conducted on a monthly basis from April 2006 through August 2007.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan for Monitoring prepared for the Sacramento River Watershed Program (SRWP 1999a, 1999b, 2003, 2006). The test results reported for 20 September 2006 were those of a re-test (SRWP 2008). The test organisms in the site water collected on 25 April 2007 exhibited ?pathogen-related mortalities? and were excluded from evaluation of ambient toxicity (SRWP 2008). The 25 April 2007 sampling event was not included in this assessment.
QAPP Information Reference(s):	

**Line of Evidence (LOE) for Decision ID 7160, Unknown Toxicity
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22841
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	42
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	<p>Seven-day reproduction toxicity tests were conducted with Ceriodaphnia dubia in association with Sacramento River Watershed Program. Two of the 42 samples exhibited significant reduction in reproduction compared to the laboratory control and violated the narrative toxicity objective. The following is a summary of toxicity test results by year.</p> <p>1998 - 1999: None of the 12 samples exhibited significant reduction in reproduction compared to the laboratory control.</p> <p>1999 - 2000: None of the 12 samples exhibited significant reduction in reproduction compared to the laboratory control.</p> <p>2000 - 2001: This site was not included in the 2000-2001 monitoring activities.</p> <p>2001 - 2002: This site was not included in the 2001-2002 monitoring activities.</p> <p>2002 - 2003: This site was not included in the 2002-2003 monitoring activities.</p> <p>2003 - 2004: This site was not included in the 2003-2004 monitoring activities.</p> <p>2006 - 2007: Two of the 18 samples exhibited significant reduction in reproduction compared to the laboratory control. The toxic samples were collected on the following dates (percentage of control response provided in parentheses): 6 July 2006 (34) and 25 April 2007 (77).</p>
Data Reference:	Sacramento River watershed program (SRWP) water quality database 1991-2003. Davis. CA
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region. Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	Statistically significant difference from control with 7-day reproduction toxicity tests. Significant toxicity is defined as decreased reproduction that is statistically different from controls at the 95% confidence level.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-821-R-02-013
Spatial Representation:	Samples were collected from the Sacramento River at Veterans Bridge.
Temporal Representation:	<p>1998 - 1999: Samples were collected monthly from June 1998 through May 1999.</p> <p>1999 - 2000: Samples were collected on a monthly basis from June 1999 through May 2000.</p> <p>2006 - 2007: Sampling was generally conducted on a monthly basis from April 2006 through August 2007.</p>
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality

Assurance Project Plan for Monitoring prepared for the Sacramento River
Watershed Program (SRWP 1999a, 1999b, 2000b, 2001b, 2002b, 2003b, 2006).

QAPP Information Reference(s):

DECISION ID 5246 **Region 5**
Sacramento River (Knights Landing to the Delta)

Pollutant: Chlorpyrifos
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2006)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of 62 available 4-day average concentrations exceeded the 4-day average maximum concentration criterion and this does not exceed the 4-day average maximum concentration criterion more than once every three years. In addition, 1 of 100 available 1-hour average concentrations exceeded the 1-hour average concentration criterion and this exceeds the 1-hour average maximum concentration criterion more than once every three years.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Board Staff Decision: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

SWRCB Board Staff Decision: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

USEPA Action (if applicable):

Line of Evidence (LOE) for Decision ID 5246, Chlorpyrifos **Region 5**
Sacramento River (Knights Landing to the Delta)

LOE ID: 2588

Pollutant: Chlorpyrifos
LOE Subgroup: Pollutant-Water

Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	193
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was obtained from the USGS NWISweb data, CMP database, two 1998, a 1999 and a 2000 California Department of Pesticide Regulation SWDB study, SRWP 1998-2000 database. None of the 193 samples from this site exceeded the CDFG guideline. Some of the concentrations were cited as less than values and as such could not be used in this assessment. (USGS, 2005), (LWA, 2002a), (LWA, 2002b), (Nordmark, 1998), (Nordmark, 1999), (Nordmark, 2000).
Data Reference:	Placeholder reference 2006 303(d)
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	CDFG Hazard Assessment Criteria - 14 ng/L 4-day average and 25 ng/L 1-hour average.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were taken at the following locations on the Sacramento River: Alamar, Freeport, Bryte, and Sacramento.
Temporal Representation:	Samples were taken from 1996 - 2002. Two samples were included from 1994 and one sample from 1995.
Environmental Conditions:	
QAPP Information:	Data from USGS reports are considered of adequate quality per section 6.1.4 of the Policy. Data from the Sacramento Coordinated Monitoring Program (CMP) Database and the Sacramento River Watershed Program (SRWP) Waters Quality Database (Larry Walker Associates, April 2002) are considered adequate.
QAPP Information Reference(s):	

**Line of Evidence (LOE) for Decision ID 5246, Chlorpyrifos
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22792
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality: 40 water samples were collected from Sacramento River in January and February 2003, representing 25 4-day average concentrations and 40 1-hour average concentrations. 0 of 25 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.015 ug/L. 0 of 40 available 1-hour average concentrations exceeded the maximum 1-hour chlorpyrifos concentration of 0.025 ug/L.

Data Reference: [Zipped file of Central Valley Waterways Pesticide TMDL monitoring data spreadsheets and reports](#)

Water Quality Objective/Criterion: No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).

Objective/Criterion Reference: [Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed](#)

Evaluation Guideline: California Department of Fish and Game Hazard Assessment Criteria - 0.015 ug/L 4-day average and 0.025 ug/L 1-hour average (Siepmann and Finlayson, 2000, with minor corrections to significant figures as described in Beaulaurier et al., 2005).

Guideline Reference: [Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game](#)

Spatial Representation: Samples were collected from Sacramento River at Discovery Park and Tower Bridge.

Temporal Representation: Samples were collected daily in two storms in January and February 2003.

Environmental Conditions:

QAPP Information: Data quality: Good. Calanchini, H. 2006. Quality Assurance Project Plan, Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. John Muir Institute of the Environment, U.C. Davis. Davis, CA.

QAPP Information Reference(s): [Quality Assurance Project Plan. Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. Final. SWAMP Project ID 02TM5001 \(Revision 0.0\). John Muir Institute of the Environment, U.C. Davis. Davis, CA. January 26, 2006](#)

**Line of Evidence (LOE) for Decision ID 5246, Chlorpyrifos
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID: 22794

Pollutant: Chlorpyrifos
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat
Aquatic Life Use: Warm Freshwater Habitat

Number of Samples: 15
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	22 water samples were collected from Sacramento River in February 2005, representing 15 4-day average concentrations and 22 1-hour average concentrations. 0 of 15 four-day average concentrations exceeded the four day maximum concentration guideline of 0.015 ug/L. 0 of 22 one-hour average concentrations exceeded the maximum 1-hour concentration of 0.025 ug/L.
Data Reference:	Zipped file of Central Valley Waterways Pesticide TMDL monitoring data spreadsheets and reports
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Department of Fish and Game Hazard Assessment Criteria - 0.015 ug/L 4-day average and 0.025 ug/L 1-hour average (Siepmann and Finlayson, 2000, with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at Veterans Drive and Tower Bridge.
Temporal Representation:	Samples were collected at daily interval in February 2005.
Environmental Conditions:	
QAPP Information:	Data quality: Excellent. Calanchini, H. 2006. Quality Assurance Project Plan, Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. John Muir Institute of the Environment, U.C. Davis. Davis, CA.
QAPP Information Reference(s):	Quality Assurance Project Plan. Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. Final. SWAMP Project ID 02TM5001 (Revision 0.0). John Muir Institute of the Environment, U.C. Davis. Davis, CA. January 26, 2006

**Line of Evidence (LOE) for Decision ID 5246, Chlorpyrifos
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22795
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: 18 water samples were collected from Sacramento River from January to March

	2006, representing 9 4-day average concentrations and 18 1-hour average concentrations. 0 of 9 four-day average concentrations exceeded the four day maximum concentration guideline of 0.015 ug/L. 0 of 18 one-hour average concentrations exceeded the maximum 1-hour concentration of 0.025 ug/L.
Data Reference:	Zipped file of Central Valley Waterways Pesticide TMDL monitoring data spreadsheets and reports
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Department of Fish and Game Hazard Assessment Criteria - 0.015 ug/L 4-day average and 0.025 ug/L 1-hour average (Siepmann and Finlayson, 2000, with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at Veterans Drive and Tower Bridge.
Temporal Representation:	Samples were collected at daily interval during one storm event from January to March 2006.
Environmental Conditions:	
QAPP Information:	Data quality: Excellent. Calanchini, H. 2006. Quality Assurance Project Plan, Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. John Muir Institute of the Environment, U.C. Davis. Davis, CA.
QAPP Information Reference(s):	Quality Assurance Project Plan. Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. Final. SWAMP Project ID 02TM5001 (Revision 0.0). John Muir Institute of the Environment, U.C. Davis. Davis, CA. January 26, 2006

**Line of Evidence (LOE) for Decision ID 5246, Chlorpyrifos
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	22793
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	20 water samples were collected from Sacramento River in January and February 2004, representing 13 4-day average concentrations and 20 1-hour average concentrations. 0 of 13 available 4-day average concentrations exceeded the 4-day maximum concentration guideline of 0.015 ug/L. 1 of 20 available 1-hour average concentrations exceeded the maximum 1-hour chlorpyrifos concentration of 0.025 ug/L.
Data Reference:	Zipped file of Central Valley Waterways Pesticide TMDL monitoring data spreadsheets and reports
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	California Department of Fish and Game Hazard Assessment Criteria - 0.015 ug/L 4-day average and 0.025 ug/L 1-hour average (Siepmann and Finlayson, 2000, with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from Sacramento River at Discovery Park and Tower Bridge.
Temporal Representation:	Samples were collected daily during three storm events in January and February 2004.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Calanchini, H. 2006. Quality Assurance Project Plan, Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. John Muir Institute of the Environment, U.C. Davis. Davis, CA.
QAPP Information Reference(s):	Quality Assurance Project Plan. Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta TMDL Monitoring for Organophosphorus Pesticides and Other Pesticides Identified as Posing a High Risk to Surface Waters. Final. SWAMP Project ID 02TM5001 (Revision 0.0). John Muir Institute of the Environment, U.C. Davis. Davis, CA. January 26, 2006

DECISION ID 14072 Region 5
Sacramento River (Knights Landing to the Delta)

Pollutant: Diuron
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Impairment from Pollutant or Pollution: Pollutant

Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to

assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 64 samples exceeded the narrative toxicity objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Board Staff Decision:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

SWRCB Board Staff Decision:

After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

USEPA Action (if applicable):

**Line of Evidence (LOE) for Decision ID 14072, Diuron
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID: 22634

Pollutant: Diuron
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat
Aquatic Life Use: Warm Freshwater Habitat

Number of Samples: 64
Number of Exceedances: 1

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: 64 Water sample was collected from Sacramento River from January 2000 through March 2001, representing 64 concentrations. 1 of 64 available samples exceeded the concentration of 1.3 ug/L.

Data Reference: [Surface Water database \(SWDB\) for Central Valley waterbodies, 2000-2005 Correspondence between the Department of Pesticide Regulation and Central Valley Regional Water Quality Control Board regarding water quality data for waterbodies in the Central Valley](#)

Water Quality Objective/Criterion: No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses (CVRWQCB, 2007). All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic

Objective/Criterion Reference:	life (CVRWQCB, 2007). Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	The Board will use the best available technical information to evaluate compliance with the narrative objectives. Other available technical information on the pesticide (such as Lowest Observed Effect Concentrations and No Observed Effect Levels), the water bodies and organisms involved will be evaluated to determine if lower concentrations are required to meet the narrative objectives. (CRWQCB, 2006). The 96 hour EC50 for the most sensitive species, <i>Chlorella pyrenoidosa</i> is 1.3 ug/L (ECOTOX, 2008 and Ma et al. 2001).
Guideline Reference:	Ecotox database Acute toxicity of 33 herbicides to the green alga <i>Chlorella pyrenoidosa</i>. Bulletin of Environmental Contamination and Toxicology. 66:536-541. Springer-Verlag New York Inc.
Spatial Representation:	Samples were collected from Sacramento River at Alamar Marina Dock, 9 mi below confluence of Feather River at variable intervals (e.g. daily or every two days)
Temporal Representation:	Samples were collected at variable intervals (daily, biweekly, monthly) from January 2000 through March 2001.
Environmental Conditions: QAPP Information:	Data quality: Good. Minimum requirements for the CDPR Surface Water Database are: Name of the sampling agency or organization, Date that each sample was collected, Date of each sample analysis, County where samples were taken, Detailed sampling location information (including latitude and longitude or township/range/section if available), detailed map or description of each sampling site (i.e., address, cross roads, etc.), Name or description of water body sampled, Name of the active ingredient analyzed for; concentration detected (with unit of measurement), and limit of quantitation, Description of analytical QA/QC plan, or statement that no formal plan exists. Additional optional requirements are included on DPR's webpage at http://www.cdpr.ca.gov/docs/emon/surfwtr/caps/req.htm
QAPP Information Reference(s):	Standard Operating Procedure for Conducting Surface Water Monitoring for Pesticides

DECISION ID 14432 **Region 5**
Sacramento River (Knights Landing to the Delta)

Pollutant:	Chlordane
Final Listing Decision:	List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Agriculture
Expected TMDL	2021
Completion Date:	
Impairment from Pollutant or Pollution:	Pollutant

Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the samples exceed the narrative toxicity water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 3 fish tissue samples exceed the Evaluation Guideline (OEHHA Fish Contaminant Goal for chlordane of 5.6 ug/kg) and, therefore, the narrative toxicity objective, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Board Staff Decision:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Staff Decision:

After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

USEPA Action (if applicable):

USEPA approved the listing of this water body as a water quality limited segment requiring a TMDL for this pollutant.

**Line of Evidence (LOE) for Decision ID 14432, Chlordane
Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID:	26120
Pollutant:	Chlordane (tissue)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish whole body
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	Sacramento Sucker, Carp and Channel Catfish were captured from the Sacramento River at Veterans Bridge on 28 September 2005. Nine analyses from each composite fish species sample were examined for different forms of Chlordane. The forms of chlordane analyzed included: cis-Chlordane, trans-Chlordane, alpha-Chlordene, gamma-Chlordene, Heptachlor, Heptachlor epoxide, cis-Nonachlor, trans-Nonachlor and Oxychlordane. One of the composite samples of Carp and one of the composite samples of Channel Catfish had total Chlordane values of 6.72 ug/kg and 10.20 ug/kg respectively, which exceed the Evaluation Guideline value of 5.6 ug/kg for total chlordane in fish tissue.
Data Reference:	Sacramento River Watershed Program Annual Reports for 1999-2000, 2000-2001, 2001-2002, 2002-2003, and 2003-2004; and BDAT data 1998-2003
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic

Objective/Criterion Reference:	life. Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	OEHHA 2008 Fish Contaminant Goals (FCG) are based on cancer risk assessments using an 8-Ounce/Week (prior to cooking) consumption rate of 32 g/day. The FCG used as a screening value for total chlordane (with a cancer slope factor of 1.3 mg/kg/day) should be less than 5.6 ug/kg.
Guideline Reference:	Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples were collected from the Sacramento River at Veterans Bridge, Lake County, California.
Temporal Representation:	Sacramento sucker, Carp and Channel catfish were captured from th Sacramento River on 28 September 2005.
Environmental Conditions:	
QAPP Information:	Data Quality: Good. Monitoring was conducted in accordance with Sacramento River Watershed Program QAPP requirements.
QAPP Information Reference(s):	Quality Assurance Project Plans prepared for Sacramento River Watershed Program

DECISION ID

14446

Region 5

Sacramento River (Knights Landing to the Delta)

Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
Final Listing Decision:	List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Agriculture
Expected TMDL	2021
Completion Date:	
Impairment from Pollutant or Pollution:	Pollutant

Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 2 composite fish samples exceeded the Evaluation Guideline (OEHHA FCG for DDT of 21 ug/kg) and, therefore, exceed the narrative toxicity objective, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Board Staff Decision:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable

water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Staff Decision:	After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.
USEPA Action (if applicable):	USEPA approved the listing of this water body as a water quality limited segment requiring a TMDL for this pollutant.

Line of Evidence (LOE) for Decision ID 14446, DDT (Dichlorodiphenyltrichloroethane)
Sacramento River (Knights Landing to the Delta)

Region 5

LOE ID:	26121
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish whole body
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	Sacramento Sucker, Carp and White Catfish were captured from the Sacramento River at Veterans Bridge on 28 September 2005 and composite fish tissue samples for eac species were analyzed for different forms of DDT, including: DDT (o,p?), DDT (p,p?), DDD (o,p?), DDD (p,p?), DDE (o,p?), DDE (p,p?), DDMU (p,p?). Two of the 3 composite fish tissue samples (for Carp and Channel Catfish) exceeded the OEHHA value of 21 ug/kg. The composite fish tissue sample for Carp had a total DDT concentration of 59.08 ug/kg. The composite fish tissue sample for Channel catfish had total DDT concentration of 109.09 ug/kg.
Data Reference:	Sacramento River Watershed Program Annual Reports for 1999-2000, 2000-2001, 2001-2002, 2002-2003, and 2003-2004; and BDAT data 1998-2003
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	OEHHA 2008 Fish Contaminant Goals (FCG) are based on cancer risk assessments using an 8-Ounce/Week (prior to cooking) consumption rate of 32 g/day. The FCG used as a screening value for total DDT (with a cancer slope factor of 0.34 mg/kg/day) should be less than 21 ug/kg.
Guideline Reference:	Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples were collected from the Sacramento River at the Veterans Bridge.
Temporal Representation:	The fish were captured from the Sacramento River on 28 September 2005.
Environmental Conditions:	
QAPP Information:	Data Quality: Good. Monitoring was conducted in accordance with Sacramento

River Watershed Program QAPP requirements.

QAPP Information Reference(s): [Quality Assurance Project Plans prepared for Sacramento River Watershed Program](#)

DECISION ID 14452 **Region 5**
Sacramento River (Knights Landing to the Delta)

Pollutant: Dieldrin
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Sources: Agriculture
Expected TMDL 2022
Completion Date:
Impairment from Pollutant or Pollution: Pollutant

Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 2 composite fish tissue samples exceed the Evaluation Guideline for Dieldrin (OEHA Fish Contaminant Goal of 0.46 ug/kg), which exceeds the narrative toxicity objective and, therefore, this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Board Staff Decision: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Staff Decision: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

USEPA Action (if applicable): USEPA approved the listing of this water body as a water quality limited segment requiring a TMDL for this pollutant.

Line of Evidence (LOE) for Decision ID 14452, Dieldrin **Region 5**
Sacramento River (Knights Landing to the Delta)

LOE ID: 26122

Pollutant: Dieldrin
LOE Subgroup: Pollutant-Tissue

Matrix:	Tissue
Fraction:	Fish whole body
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	Carp and Channel Catfish were captured from the Sacramento River at Veterans Bridge on 28 September 2005. Composite fish tissue samples for each species were analyzed for Dieldrin. Both composite fish tissue samples (for Carp and Channel Catfish) exceeded the Evaluation Guideline (OEHHA screening value of 0.46 ug/kg), and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. The Carp composite fish tissue sample had a total Dieldrin level of 0.98 ug/kg. The Channel Catfish composite fish tissue sample had a total Dieldrin level of 1.49 ug/kg.
Data Reference:	Sacramento River Watershed Program Annual Reports for 1999-2000, 2000-2001, 2001-2002, 2002-2003, and 2003-2004; and BDAT data 1998-2003
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	OEHHA 2008 Fish Contaminant Goals (FCG) are based on cancer risk assessments using an 8-Ounce/Week (prior to cooking) consumption rate of 32 g/day. The FCG used as a screening value for Dieldrin (with a cancer slope factor of 16 mg/kg/day) should be less than 0.46 ug/kg.
Guideline Reference:	Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Fish were collected from the Sacramento River at Veterans Bridge.
Temporal Representation:	Carp and Channel Catfish were captured from Sacramento River at Veterans Bridge on 28 September 2005.
Environmental Conditions:	
QAPP Information:	Data Quality: Good. Monitoring was conducted in accordance with Sacramento River Watershed Program QAPP requirements.
QAPP Information Reference(s):	Quality Assurance Project Plans prepared for Sacramento River Watershed Program

DECISION ID

13196

Region 5

Sacramento River (Knights Landing to the Delta)

Pollutant:	PCBs (Polychlorinated biphenyls)
Final Listing Decision:	List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL	2021
Completion Date:	
Impairment from Pollutant	Pollutant

or Pollution:**Conclusion:**

This pollutant is being considered for placement on the section 303(d) list under section 3.5 (Bioaccumulation of Pollutants in Aquatic Life Tissue) of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of three samples exceed the OEHHA fish contaminant goal for human health (3.6 ng/g) and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Board Staff**Decision:**

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Staff**Decision:**

After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

USEPA Action (if applicable):

USEPA approved the listing of this water body as a water quality limited segment requiring a TMDL for this pollutant.

Line of Evidence (LOE) for Decision ID 13196, PCBs (Polychlorinated biphenyls)**Region 5****Sacramento River (Knights Landing to the Delta)**

LOE ID: 25718

Pollutant: PCBs (Polychlorinated biphenyls)

LOE Subgroup: Pollutant-Tissue

Matrix: Tissue

Fraction: Fish fillet

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 3

Number of Exceedances: 3

Data and Information Type: Fish tissue analysis

Data Used to Assess Water Quality: Samples were analyzed for the presence of 48 individual PCB congeners and Aroclors 1248, 1254 and 1260. For the purpose of this assessment, data considered were the sum of PCB congeners (?total PCBs?), reported as ng/g, wet weight. The OEHHA and SWAMP recommend use of total PCBs for evaluating contamination. The values for each of the PCB congeners were surrogate corrected. For the purpose of determining the sum of PCB congeners, results for individual congeners that were below the reporting limit (0.199 ng/g) were treated as non-detects.

Total PCBs in all three of the composite samples exceeded 3.6 ng/g. Total PCBs by species (composite sample) were as follows: 53.344 ng/g in channel catfish, 5.986 ng/g in Sacramento sucker, and 25.731 ng/g in carp.

Composite samples consisted of equal-weight tissue samples from up to five fish of similar size and combined into a single 200 g composite sample (SRWP 2006).

Data source - Sacramento River Watershed Program. Final Proposition 50 Grant Monitoring Report, 2005-2007 (SRWP 2008) and electronic files containing raw data supplied by Larry Walker and Associates.

Data Reference: [Sacramento River watershed program \(SRWP\) water quality database 1991-2003. Davis, CA](#)

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

Objective/Criterion Reference: [Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed](#)

Evaluation Guideline: The California Office of Environmental Health Hazard Assessment (OEHHA) Fish Contaminant Goal for total PCBs in fish is 3.6 ng/g (3.6 ppb), wet weight, to protect human health. This concentration in fish tissue should not be exceeded, based on a total fish and shellfish consumption rate of 8 ounces per week (prior to cooking) (32 g/day) (OEHHA 2008). This goal incorporates a maximum cancer risk level of one in a million (no more than one additional cancer in a population of one million people consuming these fish).

Guideline Reference: [Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene](#)

Spatial Representation: Samples were collected from the Sacramento River at Veterans Bridge.

Temporal Representation: All samples were collected on 28 September 2005.

Environmental Conditions:

QAPP Information:

Sampling and analyses were conducted in accordance with the Quality Assurance Project Plan, Sacramento River Watershed Program, Monitoring 2005-2007 (SRWP 2006). Fish tissue samples were collected by the California Department of Fish and Game Moss Landing Marine Lab, using protocols detailed in Sampling and Processing Trace Metal and Synthetic Organic Samples of Marine Mussels, Freshwater Clams, Marine Crabs, Marine and Freshwater Fish and Sediments: DFG Method 102 (CDFG 2001). A holding time violation was noted in the dataset for all samples included in this line of evidence.

QAPP Information Reference(s):

DECISION ID

7159

Region 5

Sacramento River (Knights Landing to the Delta)

Pollutant:

Mercury

Final Listing Decision:

List on 303(d) list (TMDL required list)

Last Listing Cycle's Final Listing Decision:

List on 303(d) list (TMDL required list)(2006)

Revision Status

Original

Sources:

Resource Extraction

Expected TMDL 2012
Completion Date:
Impairment from Pollutant or Pollution: Pollutant

Conclusion: 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

RWQCB Board Staff Decision: No new data were assessed for 2008. The decision has not changed.

SWRCB Board Staff Decision: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

USEPA Action (if applicable): USEPA approved the listing of this water body as a water quality limited segment requiring a TMDL for this pollutant.

**Line of Evidence (LOE) for Decision ID 7159, Mercury
 Sacramento River (Knights Landing to the Delta)**

Region 5

LOE ID: 4516

Pollutant: Mercury
 LOE Subgroup: Pollutant-Tissue
 Matrix: Tissue
 Fraction: Not Recorded

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 0
 Number of Exceedances: 0

Data and Information Type: Not Specified
 Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.

Data Reference: [Placeholder reference pre-2006 303\(d\)](#)

Water Quality Objective/Criterion: Unspecified
 Objective/Criterion Reference: [Placeholder reference pre-2006 303\(d\)](#)

Evaluation Guideline: Unspecified
 Guideline Reference: [Placeholder reference pre-2006 303\(d\)](#)

Spatial Representation: Unspecified
 Temporal Representation: Unspecified
 Environmental Conditions: Unspecified
 QAPP Information: Unspecified
 QAPP Information Reference(s):