Peninsula CIMP Appendix B

Analytical Method Requirements and Water Quality Objectives for Constituents Listed in MRP Table E-2

CIMP Analytical Method Requirements and Water Quality Objectives for Constituents Listed in Permit MRP Table E-2 (with Additional Requirements for Constituents with TMDLs and/or 303(d)-Listed, as applicable)

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
CONVENTIONAL POLLUTANTS								
Oil and Grease	5	mg/L	EPA 1664A SM 5520 B	28 d	G / Cool, ≤ 6 °C, H_2SO_4, to pH < 2	Basin Plan	Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.	
Total Phenols	100	µg/L	EPA 420.1 SM 5530 D	28 d	G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	CTR Human Health Protection (Sources of Drinking water)	21,000	µg/L
Cyanide (Total)	5	µg/L	SM 4500 CN F ASTM D7511	14 d	P, FP, G / Cool, ≤ 6 °C, 1:1 NaOH to pH > 12, add 0.6g ascorbic acid if residual chlorine present	CTR Freshwater (1 hr avg.)	22	µg/L
						CTR Freshwater (4 day avg.)	5.2	µg/L

[1] ‘‘P’’ is for polyethylene; ‘‘FP’’ is fluoropolymer (polytetrafluoroethylene (PTFE); Teflon®), or other fluoropolymer, ‘‘G’’ is glass; ‘‘PA’’ is any plastic that is made of a sterilizable material (polypropylene or other autoclavable plastic); ‘‘LDPE’’ is low density polyethylene.

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
pH	0 - 14	N/A	Field measurement using approved method (i.e., electrometric [EPA 150.2], potentiometric [SM 4500 H B], or equivalent)	Field (15 m)	P, FP, G / Cool, ≤ 6 °C	Basin Plan	The pH of inland surface waters shall not be depressed below 6. 5 or raised above 8. 5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0. 5 units from natural conditions as a result of waste discharge. The pH of bays or estuaries shall not be depressed below 6. 5 or raised above 8. 5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0. 2 units from natural conditions as a result of waste discharge.	

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Temperature	None	°F	Field measurement using approved method (i.e., thermometer [SM 2550 B] or equivalent)	Field (15 minutes)	P, FP, G / None	Basin Plan	The natural receiving water temperature of all regional waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. Alterations that are allowed must meet the requirements below. For waters designated WARM, water temperature shall not be altered by more than 5 °F above the natural temperature. At no time shall these WARM designated waters be raised above 80 °F as a result of waste discharges. For waters designated COLD, water temperature shall not be altered by more than 5 °F above the natural temperature.	
Dissolved Oxygen	Sensitivity to 5 mg/L	mg/L	Field measurement	Field (15 m)	G, Bottle and top / None	Machado Lake Nutrient TMDL	>5 mg/L measured 0.3 meters above the sediment	

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
			using approved method (i.e., membrane electrode method [SM 4500 O G] or equivalent)			Basin Plan	At a minimum (see specifics below), the mean annual dissolved oxygen concentration of all waters shall be greater than 7 mg/L, and no single determination shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations. The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges. The dissolved oxygen content of all surface waters designated as COLD shall not be depressed below 6 mg/L as a result of waste discharges. The dissolved oxygen content of all surface waters designated as both COLD and SPWN shall not be depressed below 7 mg/L as a result of waste discharges.	

Constituent	Minimum Level (Permit Table E-2) Value	Minimum Level (Permit Table E-2) Units	Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion Source	Water Quality Objective / Criterion Value	Water Quality Objective / Criterion Units
BACTERIA (single sample limits)								
Fecal coliform	20	MPN/100 ml	SM 9221 C E	8 h	PA, G / Cool < 10 °C, 0.0008% $Na_2S_2O_3$	SMB Beaches (daily maximum)	400	MPN/100 mL
						SMB Beaches (geometric mean)	200	MPN/100 mL
						Basin Plan (REC-1, log mean, >= 4 samples for any 30-day period)	200	MPN/100 mL
						Basin Plan (REC-1, <10% samples during any 30-day period)	400	MPN/100 mL
E. coli (fresh waters)	1	MPN/100 ml	SM 9221 F	8 h	PA, G / Cool < 10 °C, 0.0008% $Na_2S_2O_3$	none	none	none
GENERAL CONSTITUENTS								
Dissolved Phosphorus[2]	0.05	mg/L	EPA 365.3	28 d	P / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	Basin Plan	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	

[2] All dissolved constituents must be filtered upon arrival at analysis laboratory as the official US EPA holding time is 15 minutes.

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Total Phosphorus	0.05	mg/L	SM 3120 B EPA 365.1	28d	G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	MS4 MAL	0.80	mg/L
						Machado Lake Nutrient TMDL (monthly average)	0.1	mg/L
Turbidity	0.1	NTU	EPA 180.1 SM 2130 B	48 h	P, FP, G / Cool, ≤ 6 °C	Basin Plan	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%. Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%. Allowable zones of dilution within which higher concentrations may be tolerated may be defined for each discharge in specific Waste Discharge Requirements.	

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Total Suspended Solids (TSS)	2	mg/L	SM 2540 D	7 d	P, FP, G / Cool, ≤ 6 °C	Basin Plan	Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	
						MS4 MAL	264.1	mg/L
Suspended Sediment Concentration (SSC)	0.5	mg/L	ASTM D-3977-97	7 d	P, G / Cool to ≤6º C, store in the dark	Basin Plan	Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	
Total Dissolved Solids (TDS)	2	mg/L	SM 2540 C	7 d	P, FP, G / Cool, ≤ 6 °C	USEPA Secondary MCL	500	mg/L
						CA Dept. Public Health Recommended Upper Level	1,000	mg/L
						CA Dept. Public Health Recommended Short-term Level	1,500	mg/L
Volatile Suspended Solids (VSS)	2	mg/L	SM 2540 E EPA 160.4	7 d	P, FP, G / Cool, ≤ 6 °C	Basin Plan	Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Total Organic Carbon (TOC)	1	mg/L	SM 5310C	28 d	P, FP, G / Cool, ≤ 6 °C, HCl, H_2SO_4, or H_3PO_4 to pH < 2	None	None	N/A
Total Petroleum Hydrocarbons (extractable fraction, i.e., diesel and motor oil range hydrocarbons)	5	mg/L	EPA 8015B	14 d to ext. / 40 d to analyze	G / Cool, ≤ 6 °C	None	None	none
Biochemical Oxygen Demand	2	mg/L	5210 B	48 h	P, FP, G / Cool, ≤ 6 °C, add 1 gram FAS crystals per liter if chlorine residual present	Basin Plan	Waters shall be free of substances that result in increases in the BOD which adversely affect beneficial uses.	
Chemical Oxygen Demand	20-900	mg/L	EPA 410.4 SM 5220 D	28 d	P, FP, G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	MAL	247.5	mg/L
Total Ammonia-Nitrogen (NH_3-N)	0.1	mg/L	EPA 350.1	28 d	P, FP, G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	Basin Plan	Varies based on pH and temperature for Cold waters and Warm Waters (Table 3-1 to 3-4 of Basin Plan)	
						Machado Lake Nutrient TMDL (one-hour average)	5.95	mg/L
						Machado Lake Nutrient TMDL (30 day average)	2.15	mg/L
Total Kjeldahl Nitrogen (TKN)	0.1	mg/L	EPA 351.2 SM 4500-NH_s	7 d or 28 d if acidified	P, FP, G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	MS4 MAL	4.59	mg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Nitrate+Nitrite (NO_2+NO_3 as N)	0.1	mg/L	EPA 300.0	24 h or 28 d if acidified	P, FP, G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	MS4 MAL	1.85	mg/L
						Basin Plan	10 as NO_3-N + NO_2-N	mg/L
Total Nitrogen (TKN+ NO_2-N+NO_3-N)	N/A		Sum of TKN, Nitrate, and Nitrite	N/A	N/A	Machado Lake Nutrient TMDL (monthly average)	1.0	mg/L
Alkalinity	2	mg/L	EPA 310.2 SM 2320B	14 d	P, FP, G / Cool, ≤ 6 °C	USEPA National Recommended Water Quality Criteria (Freshwater)	20,000	ug/L
Specific Conductance	1	umho/cm	Field measurement using approved method (i.e., conductivity meter [EPA 120.1] or equivalent)	Field (15 min) Lab (28 d) – sample should be filtered through a 0.45 micron filter and stored in dark	P, FP, G / Cool, ≤ 6 °C	CA Dept. Public Health Secondary MCL	900	µmhos/cm
Total Hardness (as $CaCO_3$)	2	mg/L	EPA 130.1	6 mo	P, FP, G / HNO_3 or H_2SO_4 to pH < 2	None	None	N/A
Methylene Blue Active Substances (MBAS)	500	µg/L	SM 5540 C	48 h	P, FP, G / Cool, ≤ 6 °C	CA Dept. Public Health Secondary MCL	500	µg/L

Constituent	Minimum Level (Permit Table E-2) Value	Units	Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion Source	Value	Units
						Basin Plan Federal MCL	500	µg/L
Chloride	2	mg/L	EPA 300.0 SM 4110B	28 d	P, FP, G / None	none	none	none
Fluoride	100	µg/L	EPA 300.0 SM 4110B	28 d	P / None	Basin Plan	2,000	µg/L
Methyl tertiary butyl ether (MTBE)	1000	µg/L	EPA 624	7	G, FP-lined septum / Cool ≤ 6 °C, 0.008% $Na_2S_2O_3$	Basin Plan	13	µg/L
						CA Dept. Public Health Secondary MCL	5	µg/L
Perchlorate	4	µg/L	EPA 314.0	28	P / None	Basin Plan	6	µg/L
METALS (TOTAL & DISSOLVED[3] FRACTIONS)			EPA 200.8 SM 3125B	6 mo	P, FP, G-acid rinsed / HNO_3 to pH < 2, or at least 24 hours prior to analysis			
Aluminum	100	µg/L	--	--	--	USDFG (1 hr)	750	µg/L
Antimony	0.5	µg/L	--	--	--	none	none	none
Arsenic	1	µg/L	--	--	--	CTR Freshwater (1 hr avg.) dissolved	340	µg/L
						CTR Freshwater (4 day avg.) dissolved	150	µg/L
Beryllium	0.5	µg/L	--	--	--	none	none	none

[3] All dissolved constituents must be filtered upon arrival at analysis laboratory. The official US EPA holding time is 15 minutes.

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Cadmium	0.25	µg/L	--	--	--	MS4 MAL	2.52	µg/L
						CTR Freshwater (1 hr avg.) total	=(EXP(1.128* LN(Hardness)-3.6867))	µg/L
						CTR Freshwater (1 hr avg.) dissolved	=(EXP(1.128* LN(Hardness)-3.6867)) *(1.136672-(LN(Hardness) *0.041838))	µg/L
						CTR Freshwater (4 day avg.) total	=(EXP(0.7852 *LN(Hardness) -2.715))	µg/L
						CTR Freshwater (4 day avg.) dissolved	=(EXP(0.7852 *LN(Hardness) -2.715)) * (1.101672-(LN(Hardness) *0.041838))	µg/L
Chromium	0.5	µg/L	--	--	--	MS4 MAL	20.20	µg/L
Chromium (Hexavalent)	5	µg/L	EPA 218.6	28 d	P, FP, G / Cool, ≤ 6 °C, $(NH_4)_2SO_4$ / NH_4OH, pH = 9.3-9.7	CTR Freshwater (1 hr avg.) dissolved	16	µg/L
						CTR Freshwater (4 day avg.) dissolved	11	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Copper	0.5	µg/L	--	--	--	MS4 MAL (Total Fraction)	71.12	µg/L
						CTR Freshwater (1 hr avg.) total	=(EXP(0.9422 *LN(Hardness) -1.7))	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Freshwater (1 hr avg.) dissolved	=(EXP(0.9422 *LN(Hardness) -1.7))*(0.96)	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Saltwater (1 hr avg.) dissolved	4.8	µg/L
						CTR Freshwater (4 day avg.) total	=(EXP(0.8545 *LN(Hardness) -1.702))	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Freshwater (4 day avg.) dissolved	=(EXP(0.8545 *LN(Hardness) -1.702))*(0.96)	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Saltwater (4 day avg.) dissolved	3.1	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Iron	100,	µg/L	--	--	--	CA Dept. Public Health Secondary MCL	300	µg/L
Lead	0.5	µg/L	--	--	--	MS4 MAL	102.00	µg/L
						CTR Freshwater (1 hr avg.) total	=(EXP(1.273* LN(Hardness)-1.46))	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Freshwater (1 hr avg.) dissolved	=(EXP(1.273* LN(Hardness)-1.46))*(1.46203-(LN(Hardness) *0.145712))	µg/L
						Greater LA and LB Harbor Toxics TMDL Saltwater (Acute) dissolved	210	µg/L
						CTR Freshwater (4 day avg.) total	=(EXP(1.273* LN(Hardness)-4.705))	µg/L
						Greater LA and LB Harbor Toxics TMDL CTR Freshwater (4 day avg.) dissolved	=(EXP(1.273* LN(Hardness)-4.705))*(1.46203-(LN(Hardness) *0.145712))	µg/L
						Greater LA and LB Harbor Toxics TMDL (chronic) dissolved	8.1	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Nickel	1	µg/L	--	--	--	MS4 MAL	27.43	µg/L
						CTR Freshwater (1 hr avg.) total	=(EXP(0.846* LN(Hardness) +2.255))	µg/L
						CTR Freshwater (1 hr avg.) dissolved	=(EXP(0.846* LN(Hardness) +2.255))*(0.998)	µg/L
						CTR Freshwater (4 day avg.) total	=(EXP(0.846* LN(Hardness) +0.0584))	µg/L
						CTR Freshwater (4 day avg.) dissolved	=(EXP(0.846* LN(Hardness) +0.0584))*(0.997)	µg/L
Selenium	1	µg/L	--	--	--	CTR Freshwater (1 hr avg.) total	20	µg/L
						CTR Freshwater (4 day avg.) total	5.0	µg/L
Silver	0.25	µg/L	--	--	--	CTR Freshwater (max instant.) (total silver)	=(EXP(1.72*LN(Hardness)-6.59))	µg/L
Thallium	1	µg/L	--	--	--	none	none	none

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Zinc	1	µg/L	--	--	--	MS4 MAL	641.3	µg/L
						CTR Freshwater (1 hr avg.) total	=(EXP(0.8473 *LN(Hardness) +0.884))	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Freshwater (1 hr avg.) dissolved	=(EXP(0.8473 *LN(Hardness) +0.884))*(0.978)	µg/L
						Greater LA and LB Harbor Harbor Toxics TMDL Saltwater (acute) dissolved	90	µg/L
						CTR Freshwater (4 day avg.) total	=(EXP(0.8473 *LN(Hardness) +0.884))	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Freshwater (4 day avg.) dissolved	=(EXP(0.8473 *LN(Hardness) +0.884))*(0.986)	µg/L
						Greater LA and LB Harbor Toxics TMDL Saltwater (chronic) dissolved	81	µg/L
Total & Dissolved Mercury	0.5	µg/L	EPA 245.7 (CVAFS)	90 d	FP, G, and FP-lined cap / 5 mL/L 12N HCl or 5 mL/L BrCl	NSWAL	0.051	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
						MS4 MAL	0.32	µg/L
						CTR Human Health Protection (30-d avg; fish consumption only)	0.051	µg/L
VOLATILE ORGANIC COMPOUNDS								
2-Chloroethyl vinyl ether[4]	1	µg/L	EPA 624	7 d	G, FP-lined septum / Cool ≤ 6 °C, 0.008% $Na_2S_2O_3$	None	None	µg/L
SEMIVOLATILE ORGANIC COMPOUNDS			EPA 625 SM 6410 B	7 d to ext. / 40 d to analyze	G, FP-lined cap / Cool ≤ 6 °C, 0.008% $Na_2S_2O_3$			
ACID COMPOUNDS								
2-Chlorophenol	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	120	µg/L

[4] Permit MRP Table E-2 lists 2-Chloroethyl vinyl ether as a base/neutral semi-volatile organic compound.

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
4-Chloro-3-methylphenol	1	µg/L	--	--	--	USEPA National Recommended Water Quality Criteria (Taste & Odor)	3,000	µg/L
2,4-Dichlorophenol	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	93	µg/L
2,4-Dimethylphenol	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	540	µg/L
2,4-Dinitrophenol	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	70	µg/L
2-Nitrophenol	10	µg/L	--	--	--	None	None	N/A
4-Nitrophenol	5	µg/L	--	--	--	None	None	N/A
Pentachlorophenol	2	µg/L	--	--	--	CTR Fresh Water (4 day avg.)	=EXP(1.005*pH-5.134)	µg/L
						CTR Freshwater (1 hr avg.)	=EXP(1.005*pH-4.869)	µg/L
Phenol	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	21,000	µg/L
2,4,6-Trichlorophenol	10	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	2.1	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
BASE/NEUTRAL COMPOUNDS								
Acenaphthene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	1,200	µg/L
Acenaphthylene	2	µg/L	--	--	--	None	None	N/A
Anthracene	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	9,600	µg/L
Benzidine	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.00012	µg/L
1,2 Benzanthracene	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L
Benzo(a)pyrene	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L
Benzo(g,h,i)perylene	5	µg/L	--	--	--	None	None	N/A
3,4 Benzoflouranthene	10	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L
Benzo(k)flouranthene	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Bis(2-Chloroethoxy) methane	5	µg/L	--	--	--	None	None	N/A
Bis(2-Chloroisopropyl) ether	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	1,400	µg/L
Bis(2-Chloroethyl) ether	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.031	µg/L
Bis(2-Ethylhexl) phthalate	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	1.8	µg/L
4-Bromophenyl phenyl ether	5	µg/L	--	--	--	None	None	N/A
Butyl benzyl phthalate	10	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	3,000	µg/L
2-Chloronaphthalene	10	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	1700	µg/L
4-Chlorophenyl phenyl ether	5	µg/L	--	--	--	None	None	N/A
Chrysene	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L
Dibenzo(a,h)anthracene	0.1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
1,3-Dichlorobenzene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	400	µg/L
1,4-Dichlorobenzene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	400	µg/L
1,2-Dichlorobenzene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	2,700	µg/L
3,3-Dichlorobenzidine	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.04	µg/L
Diethyl phthalate	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	23,000	µg/L
Dimethyl phthalate	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	313,000	µg/L
Di-n-Butyl phthalate	10	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	2,700	µg/L
2,4-Dinitrotoluene	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.11	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
2,6-Dinitrotoluene	5	µg/L	--	--	--	USEPA Toxicity LOEL	330 (acute) 230 (chronic)	µg/L
4,6 Dinitro-2-methylphenol	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	13.4	µg/L
1,2-Diphenylhydrazine	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.04	µg/L
Di-n-Octyl phthalate	10	µg/L	--	--	--	USEPA Toxicity LOEL	940 acute 3 chronic	µg/L
Fluoranthene	0.05	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	300	µg/L
Fluorene	0.1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	1,300	µg/L
Hexachlorobenzene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.00075	µg/L
Hexachlorobutadiene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.44	µg/L
Hexachloro-cyclopentadiene	5	µg/L	--	--	--	Basin Plan	50	µg/L
						CTR Human	240	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
						Health Protection (Sources of Drinking water)		
Hexachloroethane	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	1.9	µg/L
Indeno(1,2,3-cd)pyrene	0.05	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L
Isophorone	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	8.4	µg/L
Naphthalene	0.2	µg/L	--	--	--	USEPA Toxicity LOEL	2300 acute 620 chronic	µg/L
Nitrobenzene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	17	µg/L
N-Nitroso-dimethyl amine	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.00069	µg/L
N-Nitroso-diphenyl amine	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	5.0	µg/L
N-Nitroso-di-n-propyl amine	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.005	µg/L

Constituent	Minimum Level (Permit Table E-2) Value	Minimum Level (Permit Table E-2) Units	Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion Source	Water Quality Objective / Criterion Value	Water Quality Objective / Criterion Units
Phenanthrene	0.05	µg/L	--	--	--	None	None	N/A
Pyrene	0.05	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	960	µg/L
1,2,4-Trichlorobenzene	1	µg/L	--	--	--	Basin Plan	5	µg/L
CHLORINATED PESTICIDES			EPA-approved analytical methods commercially available in the region (i.e., EPA 8270)	7 d to ext. / 40 d to analyze	G, FP-lined cap / Cool ≤ 6 °C, NaOH or H_2SO_4, pH 5-9, 0.008% $Na_2S_2O_3$			
Aldrin	0.005	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.00013	µg/L
alpha-BHC	0.01	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0039	µg/L
beta-BHC	0.005	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.014	µg/L
delta-BHC	0.005	µg/L	--	--	--	None	None	N/A
gamma-BHC (lindane)	0.02	µg/L	--	--	--	CTR Freshwater (1 hr avg.)	0.95	µg/L
alpha-chlordane[a]	0.1	µg/L	--	--	--	none	none	none
gamma-chlordane[a]	0.1	µg/L	--	--	--	none	none	none

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
4,4'-DDD	0.00004	µg/L	--	--	--	Annual WLA Permit Att. M SMB DDT TMDL Water Column Target	27.08 0.00017	g/yr µg/L
						Machado Lake Toxics TMDL Water Column Target	0.00084	µg/L
4,4'-DDE	0.00008	µg/L	--	--	--	Annual WLA Permit Att. M SMB DDT TMDL Water Column Target	27.08 0.00017	g/yr µg/L
						Machado Lake Toxics TMDL Water Column Target	0.00059	µg/L
4,4'-DDT	0.00008	µg/L	--	--	--	Annual WLA Permit Att. M SMB DDT TMDL Water Column Target	27.08 0.00017	g/yr µg/L
						Machado Lake Toxics TMDL Water Column Target	0.00059	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Freshwater (4 day avg.)	0.001	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
						Greater LA and LB Harbor Toxics TMDL/CTR Saltwater (4 day avg.)	0.001	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Freshwater (1 hr avg.)	1.1	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Saltwater (1 hr avg.)	0.13	µg/L
Dieldrin	0.01	µg/L	--	--	--	Machado Lake Toxics TMDL Water Column Target	0.00014	ug/L
						Greater LA and LB Harbor Toxics TMDL/CTR Freshwater (4 day avg.)	0.056	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Saltwater (4 day avg.)	0.0019	µg/L
						Greater LA and LB Harbor Toxics TMDL/CTR Freshwater (1 hr avg.)	0.24	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
						Greater LA and LB Harbor Toxics TMDL/CTR Saltwater (1 hr avg.)	0.71	µg/L
alpha-Endosulfan	0.02	µg/L	--	--	--	CTR Freshwater (4 day avg.)	0.056	µg/L
						CTR Freshwater (max instant.)	0.22	µg/L
beta-Endosulfan	0.01	µg/L	--	--	--	CTR Freshwater (4 day avg.)	0.056	µg/L
						CTR Fresh Water (max instant.)	0.22	µg/L
Endosulfan sulfate	0.05	µg/L	--	--	--	USEPA 24 hr avg	0.056	µg/L
Endrin	0.01	µg/L	--	--	--	CTR Freshwater (4 day avg.)	0.036	µg/L
						CTR Freshwater (1 hr avg.)	0.086	µg/L
Endrin aldehyde	0.01	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.76	µg/L
Heptachlor	0.01	µg/L	--	--	--	CTR Freshwater (4 day avg.)	0.0038	µg/L
						CTR Fresh Water (max instant.)	0.52	µg/L
Heptachlor epoxide	0.01	µg/L	--	--	--	CTR Freshwater (4 day avg.)	0.0038	µg/L
						CTR Freshwater (max instant.)	0.52	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
Toxaphene	0.5	µg/L	--	--	--	CTR Freshwater (4 day avg.)	0.0002	µg/L
						CTR Freshwater (1 hr avg.)	0.73	µg/L

Constituent	Minimum Level (Permit Table E-2) Value	Minimum Level (Permit Table E-2) Units	Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion Source	Water Quality Objective / Criterion Value	Water Quality Objective / Criterion Units
POLYCHLORINATED BIPHENYLS								
Total PCBs (sum of at least 40congeners)	range for all congeners: 0.000005-0.000020	µg/L	Most sensitive, commercially available analysis in the region (i.e., Method 1668c, if feasible; otherwise, Method 8270)	1 yr to extract / 1 yr to analyze	G, FP-lined cap / Cool ≤ 6 °C	Basin Plan (30 day average)	0.014	µg/L
	Total PCBs: 0.000020	µg/L				Basin Plan (1 day average)	0.030	µg/L
						Basin Plan (Human Health)	0.000070	µg/L
						SMB PCB TMDL Water Column Target	0.000019	µg/L
						PCB TMDL Annual WLA (Permit Att. M)	140.25	g/yr
						Basin Plan	0.5	µg/L
						Machado Lake Toxics TMDL Water Column Target	0.00017	ug/L
						Greater LA and LB Harbor Toxics TMDL/CTR Freshwater (4 day avg.)	0.014	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion		
	Value	Units				Source	Value	Units
						Greater LA and LB Harbor Toxics TMDL/CTR Saltwater (4 day avg.)	0.03	µg/L
						CTR Human Health Protection (Sources of Drinking water)	0.00017	µg/L
ORGANOPHOSPHATE PESTICIDES			EPA 525.2	7 d to ext. / 40 d to analyze	G, FP-lined cap / Cool ≤ 6 °C, pH 5-9			
Atrazine	2	µg/L	--	--	--	Basin Plan	1	µg/L
Chlorpyrifos	0.05	µg/L	--	--	--	CADFG Freshwater Aquatic Life (4 day Avg)	0.014	µg/L
						CADFG Freshwater Aquatic Life (1 hr maximum)	0.02	µg/L
Cyanazine	2	µg/L	EPA 629 / 507	--	--	None	None	N/A
Diazinon	0.01	µg/L	--	--	--	CADFG Freshwater Aquatic Life (4 day Avg)	0.05	µg/L
						CADFG Freshwater Aquatic Life (1 hr maximum)	0.08	µg/L

Constituent	Minimum Level (Permit Table E-2) Value	Minimum Level (Permit Table E-2) Units	Analytical Methods	Analysis Holding Time (Max)	Container Type[1] / Preservative	Water Quality Objective / Criterion Source	Water Quality Objective / Criterion Value	Water Quality Objective / Criterion Units
Malathion	1	µg/L	--	--	--	USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life (max instant.)	0.1	µg/L
Prometryn	2	µg/L	--	--	--	None	None	N/A
Simazine	2	µg/L	--	--	--	Basin Plan	4	µg/L
						USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life (max instant.)	10	µg/L
HERBICIDES				7 d to ext. / 40 d to analyze	G, FP-lined cap / Cool ≤ 6 °C, pH 5-9			
2,4-D	10	µg/L	EPA 615 SM 6640B	--	--	Basin Plan	70	µg/L
Glyphosate	5	µg/L	EPA 547	--	--	Basin Plan	700	µg/L
2,4,5-TP-SILVEX	0.5	µg/L	EPA 615 SM 6640B	--	--	USEPA National Recommended Water Quality Criteria for Human Health	10	µg/L

[a] There are no water quality objectives explicitly listed for alpha-chlordane and gamma-chlordane; however, total chlordane (which includes alpha-chlordane, gamma-chlordane, oxychlordane, cis-nonachlor, and trans-nonachlor) is listed in the Greater LA and LB Harbor Toxics TMDL with the following water quality criteria:

- Freshwater (acute): 2.4 µg/L
- Freshwater (chronic): 0.0043 µg/L
- Saltwater (acute): 0.09 µg/L
- Saltwater (chronic): 0.004 µg/L

Data Sources:

Los Angeles County Permit Order No. R4-2012-0175

USEPA Santa Monica Bay TMDL for DDTs and PCBs (March 2012)

Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL (May 2011)

Los Angeles Region Basin Plan CH. 3 Water Quality Objectives (1994)

Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient) TMDL (April 2008)

Machado Lake Pesticides and PCBs TMDL (September 2010)

State Water Resources Control Board Online Water Quality Goals Database: (http://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/search.shtml)

USEPA Federal Register Vol. 77, No. 97, Part II. Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Analysis and Sampling Procedures (May 2012)

Quality Assurance Program Plan (QAPP), The State of California's Surface Water Ambient Monitoring Program (SWAMP) (September 2008)