

Appendix 5.12 - Summary of Morena Reservoir Source Water Constituents 2016 - 2020

CSD

			Federal/California Drinking Water Standards ¹			Basin Plan Inland Surface Waters Quality ²		2016 - 2020 Source Water Quality at Surface			
Group/Constituents	Units	CSD MDL	DLR	Primary MCL	Secondary SMCL	Criteria	Objectives	No. of Samples	Min	Max	Mean
General Physical											
Alkalinity, (Total) (as CaCO3 equivalents)	MG/L	20						19	183	425	283
Calcium Hardness (CaCO3)	MG/L	10						18	112	174	138
Color, Apparent (Unfiltered)	COLOR	1			15	20	20	18	36	120	59.1
Corrosivity ³	-							15	1.12	1.5	1.32
Hydroxide Alkalinity	MG/L							13	0	0	0
pH	PH					6.5-8.5 ⁶		15	8.18	8.78	8.57
Specific Conductance (E.C.)	UMHO/CM				1600			19	876	1940	1200
Total Filterable Residue @ 180 C (TDS)	MG/L	10			1000	300	500	19	582	1200	765
Total Hardness (CaCO3)	MG/L	10						19	225	527	357
Turbidity, Laboratory	NTU	0.07	0.1		5	20	20	20	5.24	27.6	16.2
Microbiological											
Enterococcus	/100 ML	1				60 ⁷		21	< 1	19	8.33
Escherichia Coli	/100 ML	1		Present		190 ⁷		21	< 10	10	< 10
Total Coliform	/100 ML	1		Present				21	< 10	> 24000	5370

			Federal/California Drinking Water Standards ¹			Basin Plan Inland Surface Waters Quality ²		2016 - 2020 Source Water Quality at Surface			
Group/Constituents	Units	CSD MDL	DLR	Primary MCL	Secondary SMCL	Criteria	Objectives	No. of Samples	Min	Max	Mean
Metals ⁴											
Aluminum (Al)	UG/L	5	50	1000	200			19	76.7	1120	379
Antimony	UG/L	1	6	6				19	ND	1.74	ND
Arsenic	UG/L	1	2	10				20	3.59	8.25	6.25
Barium (Ba)	UG/L	2	100	1000				20	64.5	175	96.2
Beryllium	UG/L	0.5	1	4				20	ND	ND	ND
Boron	UG/L	5	100			500	1000	20	118	362	205
Cadmium (Cd)	UG/L	0.5	1	5				20	ND	ND	ND
Calcium (Ca)	MG/L	5						20	44.8	69.4	55.2
Chromium (Total Cr)	UG/L	1	10	50				20	ND	1.06	ND
Copper (Cu) ⁵	UG/L	1	50	1300	1000			20	ND	8.13	ND
Iron (Fe)	UG/L	100	100		300	300	300	19	ND	845	240
Lead (Pb) ⁵	UG/L	0.5	5	15				20	ND	ND	ND
Magnesium (Mg)	MG/L	3						20	24.2	95.7	52.5
Manganese (Mn)	UG/L	0.5	20		50	50	50	20	46.1	224	85.7
Mercury (Hg)	UG/L	0.2	1	2				1	ND	ND	ND
Nickel	UG/L	1	10	100				20	ND	2.77	ND
Potassium (K)	MG/L	0.5						16	7.53	16.8	11.7
Selenium (Se)	UG/L	2	5	50				20	ND	ND	ND
Silver	UG/L	1	10	50				20	ND	ND	ND
Sodium (Na)	MG/L	20				60%	60%	20	86.9	229	125
Thallium	UG/L	0.5	1	2				20	ND	ND	ND
Vanadium	UG/L	1	3					20	12.7	37.9	20.1
Zinc (Zn)	UG/L	5	50		5000			18	ND	ND	ND

			Federal/California Drinking Water Standards ¹			Basin Plan Inland Surface Waters Quality ²		2016 - 2020 Source Water Quality at Surface			
Group/Constituents	Units	CSD MDL	DLR	Primary MCL	Secondary SMCL	Criteria	Objectives	No. of Samples	Min	Max	Mean
Inorganic Constituents											
Ammonia-N	MG/L	0.031				0.025		16	ND	0.462	0.098
Bicarbonate (as HCO3)	MG/L							20	204	463	323
Bromide	MG/L	0.1						20	ND	1.3	0.479
Carbonate (as CO3)	MG/L							20	ND	27.1	6.83
Chloride	MG/L	0.5			500	250	250	19	87.9	246	130
Fluoride	MG/L	0.02	0.1	2		1	1	20	0.359	0.783	0.526
Nitrate (as NO3)	MG/L		2	45		5		21	ND	2.44	0.406
Nitrite (NO2)	MG/L	0.0156	0.131	0.328				20	ND	0.593	0.072
Perchlorate	UG/L	4	4	6				40	ND	ND	ND
Phosphate, Ortho (as PO4)	MG/L	0.2						20	ND	1.32	0.231
Phosphorus	MG/L	0.078				0.025 ⁸	0.025 ⁸	17	0.054	0.455	0.195
Silica	MG/L	0.625						20	ND	23.1	9.77
Sulfate (SO4)	MG/L	0.5	0.5		500	65	250	20	86.8	237	162
Total Nitrogen	MG/L	0.156					0.25 ⁸	19	0.988	3.12	1.73

			Federal/California Drinking Water Standards ¹			Basin Plan Inland Surface Waters Quality ²		2016 - 2020 Source Water Quality at Surface			
Group/Constituents	Units	CSD MDL	DLR	Primary	Secondary	Criteria	Objectives	No. of Samples	Min	Max	Mean
				MCL	SMCL						
Organic Constituents, Regulated											
1,1,1-Trichloroethane (1,1,1-TCA)	UG/L	0.4	0.5	200		200		20	ND	ND	ND
1,1,2,2-Tetrachloroethane	UG/L	0.4	0.5	1		1		20	ND	ND	ND
1,1,2-Trichloroethane (1,1,2-TCA)	UG/L	0.4	0.5	5		32		20	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	UG/L	0.4	0.5	5		5		20	ND	ND	ND
1,1-Dichloroethylene (1,1-DCE)	UG/L	0.4	0.5	6		6		20	ND	ND	ND
1,2,4-Trichlorobenzene	UG/L	0.4	0.5	5				20	ND	ND	ND
1,2-Dichlorobenzene (o-DCB)	UG/L	0.4	0.5	600				20	ND	ND	ND
1,2-Dichloroethane (1,2-DCA)	UG/L	0.4	0.5	0.5		0.5		19	ND	ND	ND
1,2-Dichloropropane	UG/L	0.4	0.5	5		5		20	ND	ND	ND
1,4-Dichlorobenzene (p-DCB)	UG/L	0.4	0.5	5		5		20	ND	ND	ND
2,4,5-TP (SILVEX)	UG/L	1	1	50		10		20	ND	ND	ND
2,4-D	UG/L	3	10	70		100		20	ND	ND	ND
Alachlor (ALANEX)	UG/L	0.5	1	2				7	ND	ND	ND
Atrazine (AATREX)	UG/L	0.4	0.5	1		3		7	ND	ND	ND
Bentazon (BASAGRAN)	UG/L	2	2	18		18		20	ND	ND	ND
Benzene	UG/L	0.4	0.5	1		1		19	ND	ND	ND
Benzo(a)pyrene	UG/L	0.1	0.1	0.2				6	ND	ND	ND
Bromodichloromethane	UG/L	0.4	1			100		20	ND	ND	ND
Bromoform	UG/L	0.4	1			100		20	ND	ND	ND
Carbofuran (FURADAN)	UG/L	0.4	5	18		18		20	ND	ND	ND
Carbon Tetrachloride	UG/L	0.4	0.5	0.5		0.5		20	ND	ND	ND
Chlorodibromomethane	UG/L	0.4	1					20	ND	ND	ND
Chloroform (Trichloromethane)	UG/L	1	1			100		20	ND	ND	ND
cis-1,2-Dichloroethylene (c-1,2-DCE)	UG/L	0.4	0.5	6		6		20	ND	ND	ND
Di(2-ethylhexyl) Adipate	UG/L	2	5	400				7	ND	ND	ND
Di(2-ethylhexyl)phthalate (DEHP)	UG/L	3	3	4		4		7	ND	ND	ND
Dibromochloropropane (DBCP)	UG/L	0.01	0.01	0.2		0.2		20	ND	ND	ND
Dichloromethane (Methylene Chloride)	UG/L	0.4	0.5	5				20	ND	ND	ND
Dinoseb (DNBP)	UG/L	2	2	7				20	ND	ND	ND
Endrin	UG/L	0.1	0.1	2		0.2		20	ND	ND	ND
Ethyl Benzene	UG/L	0.4	0.5	300		680		20	ND	ND	ND
Ethylene Dibromide (EDB)	UG/L	0.02	0.02	0.05		0.02		20	ND	ND	ND
Glyphosate	UG/L	10	25	700		700		19	ND	ND	ND
Hexachlorobenzene	UG/L	0.5	0.5	1				7	ND	ND	ND
Hexachlorocyclopentadiene	UG/L	0.211	1	50				5	ND	ND	ND
Lindane (gamma-BHC)	UG/L	0.2	0.2	0.2		4		20	ND	ND	ND

Group/Constituents	Units	CSD MDL	Federal/California Drinking Water Standards ¹			Basin Plan Inland Surface Waters Quality ²		2016 - 2020 Source Water Quality at Surface			
			DLR	Primary MCL	Secondary SMCL	Criteria	Objectives	No. of Samples	Min	Max	Mean
meta,para xylenes	UG/L	0.4	0.5			1750		20	ND	ND	ND
Methoxychlor	UG/L	0.5	10	30		100		5	ND	ND	ND
Methyl tert-Butyl Ether (MTBE)	UG/L	0.4	3	13	5			20	ND	ND	ND
Molinate (ORDRAM)	UG/L	0.5	2	20		20		4	ND	ND	ND
Monochlorobenzene (Chlorobenzene)	UG/L	0.4	0.5	70				20	ND	ND	ND
Oxamyl (Vydate)	UG/L	0.4	20	50				20	ND	ND	ND
o-Xylene	UG/L	0.4	0.5					20	ND	ND	ND
Pentachlorophenol (PCP)	UG/L	0.2	0.2	1		1		20	ND	ND	ND
Picloram	UG/L	1	1	500				20	ND	ND	ND
Polychlorinated Biphenyls, Total, as DCB	UG/L	0.5		0.5				7	ND	ND	ND
Simazine (PRINCEP)	UG/L	0.5	1	4		10		7	ND	ND	ND
Styrene	UG/L	0.4	0.5	100				20	ND	ND	ND
Tetrachloroethylene (PCE)	UG/L	0.4	0.5	5		5		20	ND	ND	ND
Thiobencarb (BOLERO)	UG/L	0.5	1	70	1	70		6	ND	ND	ND
Toluene	UG/L	0.4	0.5	150				20	ND	ND	ND
Total Trihalomethanes (TTHMs) ⁹	UG/L	0.4		80				20	ND	ND	ND
trans-1,2-Dichloroethylene (t-1,2-DCE)	UG/L	0.4	0.5	10		10		20	ND	ND	ND
Trichloroethylene (TCE)	UG/L	0.4	0.5	5		5		20	ND	ND	ND
Trichlorofluoromethane (FREON 11)	UG/L	0.4	5	150		150		20	ND	ND	ND
Trichlorotrifluoroethane (FREON 113)	UG/L	0.4	10	1200				20	ND	ND	ND
Vinyl Chloride (VC)	UG/L	0.4	0.5	0.5		0.5		20	ND	ND	ND

			Federal/California Drinking Water Standards ¹			Basin Plan Inland Surface Waters Quality ²		2016 - 2020			
Group/Constituents	Units	CSD MDL	DLR	Primary	Secondary	Criteria	Objectives	Source	Water Quality at Surface		
				MCL	SMCL			No. of Samples	Min	Max	Mean
Organic Constituents, Unregulated											
1,1,1,2-Tetrachloroethane	UG/L	0.4	0.5					20	ND	ND	ND
1,1-Dichloropropene	UG/L	0.4	0.5					20	ND	ND	ND
1,2,3-Trichlorobenzene	UG/L	0.4	0.5					20	ND	ND	ND
1,2,3-Trichloropropane	NG/L	5	5					13	ND	ND	ND
1,2,4-Trimethylbenzene	UG/L	0.4	0.5					20	ND	ND	ND
1,3,5-Trimethylbenzene	UG/L	0.4	0.5					20	ND	ND	ND
1,3-Dichlorobenzene (m-DCB)	UG/L	0.4	0.5					20	ND	ND	ND
1,3-Dichloropropane	UG/L	0.4	0.5			0.5		20	ND	ND	ND
2,2-Dichloropropane	UG/L	0.4	0.5					20	ND	ND	ND
2,4,5-T	UG/L	3						20	ND	ND	ND
2,4-DB	UG/L	3						20	ND	ND	ND
2-Chlorotoluene	UG/L	0.4	0.5					20	ND	ND	ND
3,5-Dichlorobenzoic Acid	UG/L	3						20	ND	ND	ND
3-Hydroxycarbofuran	UG/L	0.4	3					20	ND	ND	ND
4-Chlorotoluene	UG/L	0.4	0.5					20	ND	ND	ND
4-Nitrophenol	UG/L	3	5			1		20	ND	ND	ND
Acenaphthylene	UG/L	0.5						5	ND	ND	ND
Acifluorfen	UG/L	3						20	ND	ND	ND
Aldicarb (TEMIK)	UG/L	0.4	3					20	ND	ND	ND
Aldicarb Sulfone	UG/L	0.4	4					20	ND	ND	ND
Aldicarb Sulfoxide	UG/L	0.4	3					19	ND	ND	ND
Anthracene	UG/L	0.5						7	ND	ND	ND
Baygon	UG/L	0.4						20	ND	ND	ND
Benzo (a) Anthracene	UG/L	0.5						7	ND	ND	ND
Benzo (b) Fluoranthene	UG/L	0.5						7	ND	ND	ND
Benzo (ghi) Perylene	UG/L	0.5						6	ND	ND	ND
Benzo (k) Fluoranthene	UG/L	0.5						7	ND	ND	ND
Benzyl Butyl Phthalate	UG/L	0.5						7	ND	ND	ND
Bromobenzene	UG/L	0.4	0.5					20	ND	ND	ND
Bromochloromethane	UG/L	0.4	0.5					20	ND	ND	ND
Bromomethane (Methyl Bromide)	UG/L	0.4	0.5					20	ND	ND	ND
Carbaryl (Sevin)	UG/L	0.4	5					20	ND	ND	ND
Chloramben	UG/L	3						20	ND	ND	ND
Chloroethane	UG/L	0.4	0.5					20	ND	ND	ND

Group/Constituents	Units	CSD MDL	Federal/California Drinking Water Standards ¹			Basin Plan Inland Surface Waters Quality ²		2016 - 2020 Source Water Quality at Surface			
			DLR	Primary MCL	Secondary SMCL	Criteria	Objectives	No. of Samples	Min	Max	Mean
Chloromethane (Methyl Chloride)	UG/L	0.4	0.5					20	ND	ND	ND
Chrysene	UG/L	0.5						7	ND	ND	ND
cis-1,3-dichloropropene	UG/L	0.4	0.5					20	ND	ND	ND
Dibenzo (a,h) anthracene	UG/L	0.5						7	ND	ND	ND
Dibromomethane	UG/L	0.4	0.5					20	ND	ND	ND
Dicamba (BANVEL)	UG/L	1.5	1.5					20	ND	ND	ND
Dichlorodifluoromethane (Freon 12)	UG/L	0.4	0.5					20	ND	ND	ND
Dichlorprop	UG/L	3						20	ND	ND	ND
Diethylphthalate	UG/L	0.5						7	ND	ND	ND
Diisopropyl Ether (DIPE)	UG/L	0.4	3					20	ND	ND	ND
Dimethyl phthalate	UG/L	0.5						6	ND	ND	ND
di-n-Butylphthalate	UG/L	2						7	ND	ND	ND
Ethyl-tert-Butyl Ether (ETBE)	UG/L	0.4	3					20	ND	ND	ND
Fluorene	UG/L	0.5						7	ND	ND	ND
Hexachlorobutadiene	UG/L	0.4	0.5					20	ND	ND	ND
Indeno (1,2,3-cd) Pyrene	UG/L	0.5						6	ND	ND	ND
Isopropylbenzene (Cumene)	UG/L	0.4	0.5					20	ND	ND	ND
MCPA	UG/L	3						20	ND	ND	ND
MCPP	UG/L	3						20	ND	ND	ND
Methiocarb	UG/L	0.4						20	ND	ND	ND
Methomyl	UG/L	0.4	2					20	ND	ND	ND
Naphthalene	UG/L	0.4	0.5					26	ND	ND	ND
n-Butylbenzene	UG/L	0.4	0.5					20	ND	ND	ND
n-Propylbenzene	UG/L	0.4	0.5					20	ND	ND	ND
PCB-1016 (as DCB)	UG/L	0.26	0.5	0.5				7	ND	ND	ND
PCB-1221 (as DCB)	UG/L	0.19	0.5	0.5				7	ND	ND	ND
PCB-1232 (as DCB)	UG/L	0.23	0.5	0.5				7	ND	ND	ND
PCB-1242 (as DCB)	UG/L	0.26	0.5	0.5				7	ND	ND	ND
PCB-1248 (as DCB)	UG/L	0.3	0.5	0.5				7	ND	ND	ND
PCB-1254 (as DCB)	UG/L	0.33	0.5	0.5				7	ND	ND	ND
PCB-1260 (as DCB)	UG/L	0.36	0.5	0.5				7	ND	ND	ND
Phenanthrene	UG/L	0.5				1		7	ND	ND	ND
p-Isopropyltoluene	UG/L	0.4						20	ND	ND	ND
Propachlor	UG/L	0.5	0.5					7	ND	ND	ND
Pyrene	UG/L	0.5						7	ND	ND	ND

Group/Constituents	Units	CSD MDL	Federal/California Drinking Water Standards ¹			Basin Plan Inland Surface Waters Quality ²		2016 - 2020 Source Water Quality at Surface			
			DLR	Primary MCL	Secondary SMCL	Criteria	Objectives	No. of Samples	Min	Max	Mean
sec-Butylbenzene	UG/L	0.4	0.5					20	ND	ND	ND
tert-Amyl Methyl Ether (TAME)	UG/L	0.4	3					20	ND	ND	ND
tert-Butyl Alcohol (TBA)	UG/L	1	2					20	ND	ND	ND
tert-Butylbenzene	UG/L	0.4	0.5					20	ND	ND	ND
trans-1,3-dichloropropene	UG/L	0.4	0.5	0.5				20	ND	ND	ND
Trifluralin	UG/L	0.5						7	ND	ND	ND

End Notes:

CSD MDL: City of San Diego Water Quality Laboratory minimum detection level, DLR: detection level for reporting, MCL: maximum contaminant level, SMCL: Secondary MCL, ND: not detected. Calculated mean below CSD MDL reported as ND.

¹ DLR, MCL, SMCL are obtained from California OEHHA and SWRCB and apply to drinking water and are for reference only. California MCL and SMCL values may be more stringent than federal standards for drinking water.

² Water Quality Control Plan for the San Diego Basin (9) with amendments effective on or before May 17, 2016. Water Quality Objectives concentrations not to be exceeded more than 10% of the time during any one year period.

³ Based on the Langelier index. A positive value indicates non-corrosive tendencies. A negative value indicates corrosive tendencies.

⁴ Trace metal values were from filtered and unfiltered samples. Differences in values were negligible.

⁵ Values referred to as MCLs for Lead and Copper are actually called Action Levels under the Lead and Copper Rule.

⁶ Waters designated Fresh or Warm changes in normal ambient pH levels shall not exceed 0.5 units

⁷ Beach Action Values (BAV): Amendment to the Domestic Water Permit issued by SWRCB to CSD, August 27, 2018

⁸ P= 0.025 mg/L in any standing body of water. Nitrogen threshold determined by monitoring or if data are lacking, ratio of N:P = 10:1 is used. These values not to be exceeded more than 10% of the time.

⁹ Total Trihalomethane and HAA5 compliance is based on quarterly Locational Running Annual Averages (LRAA)