

**2003 Water Quality Report to MWD Member Agencies--The Metropolitan Water District of Southern California**

Parameter	Units	State MCL [MRDL]	PHG (MCLG) [MRDLG]	State DLR	Range Average	Filtration Plant Effluents					Source Waters					Major Sources in Drinking Water
						Wey-mouth Plant	Diemer Plant	Jensen Plant	Combined Skinner Plants	Mills Plant	Lake Mathews	Castaic Lake	Silver-wood Lake	Lake Skinner	San Jacinto Tunnel West Portal	
Percent State					Range	52 - 100	26 - 100	100	19 - 46	100	0 - 10	100	100	19 - 48	0	
Project Water	%	NA	NA	NA	Average	65	65	100	33	100	2	100	100	32	0	
<b>PRIMARY STANDARDS--Mandatory Health-Related Standards</b>																
<b>CLARITY</b>																
Combined Filter	NTU	0.3			Highest	0.09	0.06	0.08	0.09	0.14	NA	NA	NA	NA	NA	
Effluent Turbidity	%	95 (a)	NA	NA	% < 0.3	100%	100%	100%	100%	100%	NA	NA	NA	NA	NA	Soil runoff
<b>MICROBIOLOGICAL</b>																
Total Coliform					Range	Distribution System-wide: 0 - 0.11 %					NA	NA	NA	NA	NA	Naturally present in the environment
Bacteria	%	5.0 (b)	(0)	NA	Average	Distribution System-wide: 0.02 %					NA	NA	NA	NA	NA	Naturally present in the environment
Fecal Coliform and <i>E. coli</i>	(c)	(c)	(0)	NA	Distribution System-wide Fecal Coliform-positive samples = 0											
					Distribution System-wide <i>E.coli</i> -positive samples = 0											Human and animal fecal waste
Heterotrophic Plate Count (HPC) (d)	CFU/mL	TT	NA	NA	Range	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Naturally present in the environment
					Average	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Naturally present in the environment
<i>Cryptosporidium</i> (e)	Oocysts/100 L	TT	(0)	NA	Range	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Human and animal fecal waste
					Average	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Human and animal fecal waste
<i>Giardia</i> (e)	Cysts/100 L	TT	(0)	NA	Range	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Human and animal fecal waste
					Average	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Human and animal fecal waste
Total Culturable Viruses (e)	MPN/100 L	TT	(0)	NA	Range	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Human and animal fecal waste
					Average	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Human and animal fecal waste
<i>Legionella</i> (e)	MPN/100 L	TT	(0)	NA	Range	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Naturally present in the environment
					Average	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Naturally present in the environment
<b>ORGANIC CHEMICALS</b>																
<b>Pesticides/PCBs</b>																
Acrylamide	NA	TT	(0)	NA	Range	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Water treatment chemical impurities
					Average	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Water treatment chemical impurities
Alachlor	ppb	2	4	1	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on row crops
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on row crops
Atrazine	ppb	1	0.15	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on row crops and along highways
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from herbicide used on rice, alfalfa, and grapes
Bentazon	ppb	18	200	2	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Leaching of soil fumigant used on rice, alfalfa, and grapes
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Leaching of soil fumigant used on rice, alfalfa, and grapes
Carbofuran	ppb	18	1.7	5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Residue of banned termiticide
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Residue of banned termiticide
Chlordane	ppt	100	30	100	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on row crops, range land, lawns
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on row crops, range land, lawns
2,4-D	ppb	70	70	10	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on right-of-way, crops, and landscapes
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on right-of-way, crops, and landscapes
Dalapon	ppb	200	790	10	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Banned nematocide that may still be present in soils
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Banned nematocide that may still be present in soils
Dinoseb	ppb	7	14	2	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on soybeans, vegetables, and fruits
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on soybeans, vegetables, and fruits
Diquat	ppb	20	15	4	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used for terrestrial and aquatic weeds
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used for terrestrial and aquatic weeds
Endothall	ppb	100	580	45	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used for terrestrial and aquatic weeds
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used for terrestrial and aquatic weeds
Endrin	ppb	2	1.8	0.1	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Residue of banned insecticide
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Residue of banned insecticide
Epichlorohydrin	NA	TT	(0)	NA	Range	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Water treatment chemical impurities
					Average	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Water treatment chemical impurities
Ethylene Dibromide (EDB)	ppt	50	10	20	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Petroleum refinery discharges; underground gas tank leaks
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Petroleum refinery discharges; underground gas tank leaks
Glyphosate	ppb	700	1000	25	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide use
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide use
Heptachlor	ppt	10	8	10	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Residue of banned pesticide
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Residue of banned pesticide
Heptachlor Epoxide	ppt	10	6	10	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Breakdown product of heptachlor
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Breakdown product of heptachlor

**2003 Water Quality Report to MWD Member Agencies--The Metropolitan Water District of Southern California**

Parameter	Units	State MCL [MRDL]	PHG (MCLG) [MRDLG]	State DLR	Range Average	Filtration Plant Effluents					Source Waters					Major Sources in Drinking Water
						Wey-mouth Plant	Diemer Plant	Jensen Plant	Combined Skinner Plants	Mills Plant	Lake Mathews	Castaic Lake	Silver-wood Lake	Lake Skinner	San Jacinto Tunnel West Portal	
Lindane	ppt	200	32	200	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from insecticide used on cattle, lumber, gardens
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Methoxychlor	ppb	30	30	10	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from insecticide uses
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Molinate (Ordram)	ppb	20	NA	2	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from herbicide used on rice
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Oxamyl (Vydate)	ppb	50	50	20	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from insecticide uses
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Pentachlorophenol	ppb	1	0.4	0.2	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Discharge from wood preserving factories; other insecticidal uses
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Picloram	ppb	500	500	1	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Herbicide runoff
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Polychlorinated Biphenyls (PCBs)	ppt	500	(0)	500	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff from landfills; discharge of waste chemicals
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Simazine	ppb	4	4	1	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Herbicide runoff
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Thiobencarb (f)	ppb	70	70	1	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff leaching from rice herbicide
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2,4,5-TP (Silvex)	ppb	50	25	1	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Residue of banned herbicide
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Toxaphene	ppb	3	0.03	1	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from insecticide used on cotton and cattle
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
<b>Semi-Volatile Organic Compounds</b>																
Benzo(a)pyrene (PAH)	ppt	200	4	100	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Leaching from water storage tank linings and distribution lines
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Di(2-ethylhexyl)-adipate	ppb	400	200	5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Discharge from chemical factories
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Di(2-ethylhexyl)-phthalate	ppb	4	12	3	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Chemical factory discharge; inert ingredient in pesticides
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Hexachloro-benzene	ppb	1	0.03	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Discharge from metal refineries and agricultural chemical factories
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Hexachloro-cyclopentadiene	ppb	50	50	1	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Discharge from chemical factories
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2,3,7,8-TCDD (Dioxin)	ppg	30	(0)	5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Waste incineration emissions; chemical factory discharges
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
<b>Volatile Organic Compounds</b>																
Benzene	ppb	1	0.15	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Plastics factory discharges; gas tanks and landfill leaching
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Carbon Tetrachloride	ppt	500	100	500	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Chemical plant discharges; other industrial waste discharges
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
o-Dichlorobenzene	ppb	600	600	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial chemical factories
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
p-Dichlorobenzene	ppb	5	6	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial chemical factories
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1-Dichloroethane	ppb	5	3	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Extraction and degreasing solvent; fumigant
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichloroethane	ppt	500	400	500	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial chemical factories
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1-Dichloroethylene	ppb	6	10	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial chemical factories
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
cis-1,2-Dichloro-ethylene	ppb	6	(70)	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Industrial chemical factory discharges; product of TCE and PCE
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
trans-1,2-Dichloro-ethylene	ppb	10	(100)	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Industrial chemical factory discharges; product of TCE and PCE
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dichloromethane (Methylene Chloride)	ppb	5	4	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Discharge from pharmaceutical and chemical factories
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichloropropane	ppb	5	0.5	0.5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Industrial chemical factory discharges; from fumigants
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,3-Dichloropropene	ppt	500	200	500	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from nematocide used on croplands
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

**2003 Water Quality Report to MWD Member Agencies--The Metropolitan Water District of Southern California**

Parameter	Units	State MCL [MRDL]	PHG (MCLG) [MRDLG]	State DLR	Range Average	Filtration Plant Effluents					Source Waters					Major Sources in Drinking Water
						Wey-mouth Plant	Diemer Plant	Jensen Plant	Combined Skinner Plants	Mills Plant	Lake Mathews	Castaic Lake	Silver-wood Lake	Lake Skinner	San Jacinto Tunnel West Portal	
Ethylbenzene	ppb	300	300	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Petroleum refinery discharges; industrial chemical factories	
Methyl-tert-butyl-ether (MTBE) (f,g)	ppb	13	13	3	Range Average	ND - 0.8 ND	ND - 0.7 ND	ND ND	ND - 0.5 ND	ND - 1 ND	ND ND	ND - 0.5 0.7	ND - 2 ND	ND - 0.5 ND	Gasoline discharges from watercraft engines	
Monochlorobenzene	ppb	70	200	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Industrial, agricultural, and chemical waste discharges, and dry cleaners	
Styrene	ppb	100	(100)	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Rubber and plastics factories discharges; landfill leaching	
1,1,2,2-Tetrachloroethane	ppb	1	0.1	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Industrial, agricultural, and chemical waste discharges; solvent uses	
Tetrachloroethylene (PCE)	ppb	5	0.06	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Discharge from factories, dry cleaners, and auto shops	
Toluene	ppb	150	150	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Discharge from petroleum and chemical refineries	
1,2,4-Trichlorobenzene	ppb	5	5	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Discharge from textile-finishing factories	
1,1,1-Trichloroethane	ppb	200	(200)	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Metal degreasing site discharges; manufacture of food wrappings	
1,1,2-Trichloroethane	ppb	5	(3)	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Discharge from industrial chemical factories	
Trichloroethylene (TCE)	ppb	5	0.8	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Metal degreasing site discharges and other factories	
Trichlorofluoromethane	ppb	150	700	5.0	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Industrial factory discharges; degreasing solvent; propellant	
1,1,2-Trichloro-1,2,2-trifluoroethane	ppm	1.2	4	0.01	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Discharge from petroleum and chemical refineries; fuel solvent	
Vinyl Chloride	ppt	500	50	500	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Leaching from PVC piping; plastics factory discharges	
Xylenes	ppm	1.750	1.8	0.0005	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Discharge from petroleum and chemical refineries; fuel solvent	
<b>INORGANIC CHEMICALS</b>																
Aluminum (f)	ppb	1000	600	50	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND - 149 ND	ND - 91 ND	ND - 146 58	ND 119	ND - 1290 119	Residue from water treatment process; natural deposits; erosion
Antimony	ppb	6	20	6	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Petroleum refinery discharges; fire retardants; solder; electronics
Arsenic	ppb	50	NA	2	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	2.1 - 2.9 2.5	2.3 - 2.7 2.5	ND - 2.5 2.2	ND - 2.9 2.2	2.4 - 3.0 2.6	Natural deposits erosion, glass and electronics production wastes
Asbestos	MFL	7	(7)	0.2	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Asbestos, cement pipes internal corrosion; natural deposits; erosion
Barium	ppm	1	2	0.1	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND - 0.12 0.11	ND ND	ND ND	ND ND	0.11 - 0.12 0.12	Oil and metal refineries discharges; natural deposits erosion
Beryllium	ppb	4	1	1	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Discharge from metal refineries, aerospace, and defense industries
Cadmium	ppb	5	0.07	1	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND - 1.4 ND	ND - 4.1 ND	ND ND	ND ND	ND ND	Internal corrosion of galvanized pipes; natural deposits erosion
Chromium	ppb	50	(100)	10	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Discharge from steel and pulp mills; natural deposits erosion
Copper (f)	ppm	AL=1.3	0.17	0.05	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Internal corrosion of household pipes; natural deposits erosion
Cyanide	ppb	150	150	100	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Discharge from steel/metal, plastic and fertilizer factories
Fluoride	ppm	2	1	0.1	Range Average	ND - 0.20 0.15	ND - 0.20 0.14	ND - 0.14 0.11	0.15 - 0.27 0.22	ND ND	0.21 - 0.31 0.29	ND - 0.15 0.12	ND - 0.11 ND	0.18 - 0.28 0.23	0.21 - 0.34 0.29	Erosion of natural deposits; water additive for tooth health
Lead	ppb	AL=15	2	5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	House pipes internal corrosion; erosion of natural deposits
Mercury	ppb	2	1.2	1	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Erosion of natural deposits; Factory discharges; landfill runoff
Nickel	ppb	100	12	10	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	Erosion of natural deposits; discharge from metal factories
Nitrate (as N) (h)	ppm	10	10	0.4	Range Average	ND - 1.3 0.5	ND - 1.4 0.6	0.5 - 0.7 0.6	ND ND	ND - 1.3 0.7	ND ND	0.5 - 0.7 0.6	ND - 1.4 0.7	ND ND	ND ND	Runoff and leaching from fertilizer use; sewage; natural erosion

## 2003 Water Quality Report to MWD Member Agencies--The Metropolitan Water District of Southern California

Parameter	Units	State MCL [MRDL]	PHG (MCLG) [MRDLG]	State DLR	Range Average	Filtration Plant Effluents					Source Waters					Major Sources in Drinking Water
						Wey-mouth Plant	Diemer Plant	Jensen Plant	Combined Skinner Plants	Mills Plant	Lake Mathews	Castaic Lake	Silverwood Lake	Lake Skinner	San Jacinto Tunnel West Portal	
Nitrite (as N)	ppm	1	1	0.4	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Runoff and leaching from fertilizer use; sewage; natural erosion
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Nitrate and Nitrite (as N)	ppm	10	10	0.4	Range	ND - 1.3	ND - 1.4	0.5 - 0.7	ND	ND - 1.3	ND	0.5 - 0.7	ND - 1.4	ND	ND	Runoff and leaching from fertilizer use; sewage; natural erosion
					Average	0.5	0.6	0.6	ND	0.7	ND	0.6	0.7	ND	ND	
Selenium	ppb	50	(50)	5	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Refineries, mines, and chemical waste discharges; runoff
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Thallium	ppb	2	0.1	1	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Leaching from ore-processing electronics factory discharges
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
<b>RADIOLOGICALS (i)</b>																
Gross Alpha Particle Activity	pCi/L	15	NA	1	Range	1.57 - 4.30	ND - 2.54	ND - 1.62	2.99 - 3.96	ND - 3.07	3.54 - 5.20	1.42 - 3.78	ND - 2.81	3.23 - 4.19	3.10 - 6.37	Erosion of natural deposits
					Average	2.40	ND	1.09	3.41	1.81	4.24	2.44	1.72	3.68	4.12	
Gross Beta Particle Activity	pCi/L	50	NA	4	Range	ND - 5.02	ND - 5.90	ND - 6.20	ND - 4.08	ND	ND - 8.48	ND	ND	ND - 7.23	ND - 4.40	Decay of natural and man-made deposits
					Average	ND	4.13	4.86	ND	ND	5.46	ND	ND	5.33	ND	
Combined Radium (i)	pCi/L	5	NA	0.5	Range	ND	ND	ND	ND-0.51	ND	ND	ND	ND	ND	ND	Erosion of natural deposits
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Strontium-90	pCi/L	8	NA	2	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Decay of natural and man-made deposits
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Tritium	pCi/L	20,000	NA	1,000	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Decay of natural and man-made deposits
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Uranium	pCi/L	20	0.5	2	Range	ND - 2.95	ND - 2.56	ND	ND - 2.39	ND	2.39 - 4.12	ND	ND - 4.68	ND - 3.68	ND - 3.92	Erosion of natural deposits
					Average	ND	ND	ND	ND	ND	3.29	ND	2.52	2.82	ND	
<b>DISINFECTION BY-PRODUCTS, DISINFECTANT RESIDUALS, AND DISINFECTION BY-PRODUCTS PRECURSORS</b>																
Total Trihalomethanes (TTHM) (k)	ppb	80	NA	0.5	Range	32 - 68	29 - 74	38 - 75	32 - 61	25 - 80	NA	NA	NA	NA	NA	By-product of drinking water chlorination
					Average	51	54	52	45	49	NA	NA	NA	NA	NA	
Total Trihalomethanes (TTHM) (k)	ppb	80	NA	0.5	Range	Distribution System-wide: 33 - 77					NA	NA	NA	NA	NA	By-product of drinking water chlorination
					Average	Distribution System-wide (Highest RAA): 57					NA	NA	NA	NA	NA	
Haloacetic Acids (five) (HAA5) (k,l)	ppb	60	NA	1 (l)	Range	10 - 28	10 - 36	11 - 17	11 - 20	6 - 27	NA	NA	NA	NA	NA	By-product of drinking water chlorination
					Average	20	21	14	16	15	NA	NA	NA	NA	NA	
Haloacetic Acids (five) (HAA5) (k,l)	ppb	60	NA	1 (l)	Range	Distribution System-wide: 7.1 - 37					NA	NA	NA	NA	NA	By-product of drinking water chlorination
					Average	Distribution System-wide (Highest RAA): 21					NA	NA	NA	NA	NA	
Total Chlorine Residual	ppm	[4]	[4]	NA	Range	Distribution System-wide: 2.4					NA	NA	NA	NA	NA	Drinking water disinfectant added for treatment
					Average	Distribution System-wide: 2.4					NA	NA	NA	NA	NA	
Bromate (m)	ppb	10	(0)	5	Range	NA	NA	NA	NA	4.5 - 10.4	NA	NA	NA	NA	NA	By-product of drinking water ozonation
					Average	NA	NA	NA	NA	6.6	NA	NA	NA	NA	NA	
DBP Precursors Control (TOC) (k)	ppm	TT	NA	0.7	Range	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	Various natural and man-made sources
					Average	TT	TT	TT	TT	TT	NA	NA	NA	NA	NA	
<b>SECONDARY STANDARDS--Aesthetic Standards</b>																
Aluminum (f)	ppb	200	600	50	Range	ND	ND	ND	ND	ND	ND- 149	ND - 91	ND - 146	ND	ND - 1290	Residue from water treatment process; natural deposits erosion
					Average	ND	ND	ND	ND	ND	ND	ND	58	ND	119	
Chloride	ppm	500	NA	NA	Range	67 - 103	67 - 105	68 - 96	76 - 92	47 - 114	80 - 83	59 - 88	42 - 99	70 - 85	77 - 84	Runoff/leaching from natural deposits; seawater influence
					Average	79	81	82	81	70	81	74	64	76	81	
Color	Units	15	NA	NA	Range	1 - 2	1	2	1 - 3	1 - 2	2 - 3	4 - 8	5 - 16	2 - 7	2 - 5	Naturally occurring organic materials
					Average	1	1	2	2	1	3	6	10	4	3	
Copper (f)	ppm	1	0.17	0.05	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Internal corrosion of household pipes; natural deposits erosion
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Corrosivity	SI	non-corrosive	NA	NA	Range	-0.17 - 0.34	-0.23 - 0.39	0.07 - 0.21	0.20 - 0.36	-0.03 - 0.14	NA	NA	NA	NA	NA	Elemental balance in water; affected by temperature, other factors
					Average	0.15	0.14	0.13	0.30	0.07	NA	NA	NA	NA	NA	
Foaming Agents (MBAS)	ppb	500	NA	NA	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Municipal and industrial waste discharges
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Iron	ppb	300	NA	100	Range	ND	ND	ND	ND	ND	ND	ND	ND - 168	ND	ND	Leaching from natural deposits; industrial wastes
					Average	ND	ND	ND	ND	ND	ND	ND	124	ND	ND	
Manganese	ppb	50	NA	20	Range	ND	ND	ND	ND	ND	ND	ND	ND - 36	ND	ND	Leaching from natural deposits
					Average	ND	ND	ND	ND	ND	ND	ND	22	ND	ND	
MTBE (f,g)	ppb	5	13	3	Range	ND - 0.8	ND - 0.7	ND	ND - 0.5	ND - 1	ND	ND - 0.5	ND - 2	ND - 0.5	ND	Gasoline discharges from watercraft engines
					Average	ND	ND	ND	ND	ND	ND	ND	0.7	ND	ND	
Odor Threshold (n)	Units	3	NA	NA	Range	(n)	(n)	(n)	(n)	(n)	(n)	(n)	(n)	(n)	(n)	Naturally occurring organic materials
					Average	(n)	(n)	(n)	(n)	(n)	(n)	(n)	(n)	(n)	(n)	
Silver	ppb	100	NA	10	Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Industrial discharges
					Average	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Specific Conductance	µmho/cm	1600	NA	NA	Range	541 - 799	518 - 890	473 - 596	745 - 922	361 - 660	930 - 990	452 - 569	326 - 592	728 - 897	959 - 983	Substances that form ions in water; seawater influence
					Average	679	671	550	816	476	960	523	446	812	969	
					Range	41 - 138	41 - 177	42 - 53	147 - 206	34 - 91	222 - 237	41 - 52	19 - 43	146 - 200	234 - 242	Runoff/leaching from natural



**2003 Water Quality Report to MWD Member Agencies--The Metropolitan Water District of Southern California**

Parameter	Units	State MCL [MRDL]	PHG (MCLG) [MRDLG]	State DLR	Range Average	Filtration Plant Effluents					Source Waters					Major Sources in Drinking Water
						Wey-mouth Plant	Diemer Plant	Jensen Plant	Combined Skinner Plants	Mills Plant	Lake Mathews	Castaic Lake	Silver-wood Lake	Lake Skinner	San Jacinto Tunnel West Portal	
Perchlorate	ppb	NA	NA	4	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND - 5.1 ND	ND ND	ND ND	ND ND	ND - 5.4 ND	Industrial waste discharge
Terbacil	ppb	NA	NA	2	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
<b>List 2 - Screening Survey</b>																
1,2-Diphenyl-hydrazine	ppb	NA	NA	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
2-Methylphenol	ppb	NA	NA	1	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
2,4-Dichlorophenol	ppb	NA	NA	1	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
2,4-Dinitrophenol	ppb	NA	NA	5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
2,4,6-Trichlorophenol	ppb	NA	NA	1	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
Diazinon	ppb	NA	NA	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
Disulfoton	ppb	NA	NA	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
Diuron	ppb	NA	NA	1	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
Fonofos	ppb	NA	NA	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
Linuron	ppb	NA	NA	1	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
Nitrobenzene	ppb	NA	NA	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
Prometon	ppb	NA	NA	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
Terbufos	ppb	NA	NA	0.5	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
<b>OTHER PARAMETERS</b>																
Alkalinity	ppm	NA	NA	--	Range Average	79 - 102 92	73 - 112 89	81 - 89 86	100 - 124 112	57 - 80 67	120 - 137 133	81 - 88 86	68 - 87 78	106 - 126 114	130 - 137 134	
Calcium	ppm	NA	NA	--	Range Average	24 - 44 37	24 - 56 37	22 - 26 25	49 - 64 54	16 - 25 20	63 - 72 69	22 - 26 25	15 - 26 20	48 - 63 55	67 - 72 71	
Hardness	ppm	NA	NA	--	Range Average	111 - 194 164	109 - 237 164	108 - 127 120	209 - 264 227	81 - 122 97	268 - 297 288	106 - 127 120	77 - 118 99	207 - 260 232	281 - 299 293	
Magnesium	ppm	NA	NA	--	Range Average	12.5-20.5 17.5	12.0-23.5 17.5	12.0-15.0 14	21 - 26 22.5	9.5 - 15 11.5	27 - 29 28	12 - 15.5 14	9.5 - 15 12	20.5 - 25 23	27 - 29 28	
pH	Units	NA	NA	--	Range Average	8.07 - 8.20 8.15	8.02 - 8.25 8.15	8.26 - 8.35 8.31	8.04 - 8.08 8.06	8.36 - 8.47 8.41	7.60 - 8.42 8.12	7.69 - 8.09 7.88	7.79 - 8.27 8.11	8.13 - 8.42 8.28	8.26 - 8.42 8.36	
Potassium	ppm	NA	NA	--	Range Average	2.6 - 3.9 3.2	2.7 - 4.0 3.2	2.6 - 3.3 2.9	3.6 - 4.3 3.9	2.1 - 3.6 2.6	4.2 - 4.5 4.4	2.6 - 3.4 2.9	2.0 - 3.6 2.6	3.6 - 4.2 3.9	4.2 - 4.8 4.4	
Radon (i)	pCi/L	NA	NA	100	Range Average	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	
Sodium	ppm	NA	NA	--	Range Average	58 - 82 69	55 - 87 68	50 - 67 59	66 - 89 76	37 - 82 53	86 - 90 88	46 - 63 55	32 - 68 47	66 - 83 75	85 - 91 89	
TOC (p)	ppm	TT	NA	0.7	Range Average	1.7 - 2.7 2.1	1.7 - 2.7 2.1	1.9 - 2.4 2.1	2.0 - 2.7 2.4	1.6 - 3.1 2.1	2.8 - 5.7 3.4	2.4 - 2.8 2.6	2.4 - 5.6 3.7	2.6 - 3.1 2.9	2.8 - 5.6 4.1	Various natural and man-made sources

## 2003 Water Quality Report to MWD Member Agencies--*The Metropolitan Water District of Southern California*

Parameter	Units	State MCL [MRDL]	PHG (MCLG) [MRDLG]	State DLR	Range Average	Filtration Plant Effluents					Source Waters					Major Sources in Drinking Water
						Wey-mouth Plant	Diemer Plant	Jensen Plant	Com-bined Skinner Plants	Mills Plant	Lake Mathews	Castaic Lake	Silver-wood Lake	Lake Skinner	San Jacinto Tunnel West Portal	

### ABBREVIATIONS AND FOOTNOTES

#### Abbreviations

AL	California Action Level	MPN	Most Probable Number	ppq	parts per quadrillion or picograms per liter (pg/L)
CFU/mL	Colony Forming Units per milliliter	MRDL	Maximum Residual Disinfectant Level	ppt	parts per trillion or nanograms per liter (ng/L)
DCPA	Dimethyl Tetrachloroterephthalate	MRDLG	Maximum Residual Disinfectant Level Goal	RAA	Running Annual Average
DBP	Disinfection By-Products	N	Nitrogen	SI	Saturation Index (Langelier)
DLR	Detection Limits for purposes of Reporting	NA	Not Applicable	TOC	Total Organic Carbon
HAA5	Haloacetic Acids (five)	ND	None Detected	TTHM	Total Trihalomethanes
ICR	Information Collection Rule	NTU	Nephelometric Turbidity Units	TT	Treatment Technique
MBAS	Methylene Blue Active Substances	pCi/L	picoCuries per liter	UCMR	Unregulated Contaminants Monitoring Rule
MCL	Maximum Contaminant Level	PHG	Public Health Goal	µmho/cm	micromho per centimeter
MCLG	Maximum Contaminant Level Goal	ppb	parts per billion or micrograms per liter (µg/L)		
MFL	Million Fibers per Liter	ppm	parts per million or milligrams per liter (mg/L)		

#### Footnotes

- (a) The turbidity level of the filtered water shall be less than or equal to 0.3 NTU in 95% of the measurements taken each month and shall not exceed 1.0 NTU at any time. Turbidity is a measure of the cloudiness of the water and is a good indicator of water quality and filtration performance. The monthly averages and ranges of turbidity shown in the Secondary Standards section were based on the plant effluents.
- (b) Total coliform MCLs: No more than 5.0% of the monthly samples may be total coliform-positive. Compliance is based on the combined distribution system sampling from all the filtration plants. In 2003, 10,885 samples were analyzed. The MCL was not violated.
- (c) Fecal coliform/*E. coli* MCLs: The occurrence of 2 consecutive total coliform-positive samples, one of which contains fecal coliform/*E. coli*, constitutes an acute MCL violation. The MCL was not violated in 2003.
- (d) HPC values were based on the monthly averages of the plant effluent samples. In 2003, all distribution samples collected had detectable total chlorine residuals and no HPC was required.
- (e) In 2003, the plant effluents had no detectable *Cryptosporidium*, *Giardia*, and Total Culturable Viruses and no *Legionella* analysis was required. Additionally, there were no *Cryptosporidium*, *Giardia* and Total Culturable Viruses found in all of the plant influents except at Mills. A single *Cryptosporidium* oocyst was detected in one monthly sample of Mills plant influent that was equivalent to 10 oocysts/100 L.
- (f) Aluminum, copper, MTBE, and thiobencarb have both primary and secondary standards.
- (g) MTBE reporting level is 0.5 ppb.
- (i) Results based on the 2002 - 2003 four-quarter radiological monitoring program.
- (j) Standard is for Radium-226 and -228 combined.
- (k) Average and range for the filtration plant effluents were taken from weekly samples for TTHM and monthly samples for HAA5. Distribution system-wide average and range were taken from 47 samples collected quarterly. In 2003, Metropolitan was in compliance with all provisions of the Stage 1 Disinfectants/Disinfection By-Products (D/DBP) Rule. Metropolitan was also in compliance with the DBP precursor control portion of the Stage 1 regulation.
- (l) DLR = 1.0 ppb for each HAA5 analyte (dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid) except for monochloroacetic acid which has a DLR = 2.0 ppb.
- (m) Bromate compliance monitoring began in October 2003. Range values based on weekly samples. Running annual average will be calculated after four consecutive quarters of samples have been collected by third quarter 2004.
- (n) Metropolitan has developed a flavor-profile analysis method that can more accurately detect odor occurrences. For more information, contact MWD at (213) 217-6850.
- (o) Data collected from January 2002 to January 2003. Minimum reporting levels are as stipulated in the Federal UCMR.
- (p) TOCs at the filtration plants were taken at the filter effluents.