2020 Water Quality Report to Member Agencies—The Metropolitan Water District of Southern California
Treatment Plant Effluents and Distribution System

Parameter		Units	State (Federal) MCL	PHG	State DLR/CCRDL (RL)	Range Average	Treatment Plant Effluent *					Distribution System	Major Sources in Drinking Water
							Diemer Plant	Jensen Plant	Mills Plant	Skinner Plant	Weymouth Plant		
Percent State Water Project		%	NA	NA	NA	Range	0 - 94	100	100	0 - 84	0 - 90		Not applicable
						Average	9			32	10		
PRIMARY STANDARDS—Mandatory Health-Related Standards													
CLARITY													
Combined Filter Effluent (CFE) Turbidity	(a)	NTU	TT	NA	NA	Highest	0.04	0.04	0.09	0.09	0.04		Soil runoff
		%				% <= 0.3	100	100	100	100	100		
MICROBIOLOGICAL	**(b)**												
Total Coliform Bacteria	(c)	% Positive Monthly Samples	5.0	MCLG = 0	NA	Range	NA	NA	NA	NA	NA	0 - 0.1	Naturally present in the environment
						Average						0	
Escherichia coli (E. coli)	(d)	Number	1	MCLG = 0	NA	Number of Positive Samples	NA	NA	NA	NA	NA	0	Human and animal fecal waste
Heterotrophic Plate Count (HPC) Bacteria	(e)	CFU/mL	TT	NA	(1)	Median Range	ND - 1	ND - 3	ND - 1	ND - 1	ND		Naturally present in the environment
						Median	ND	ND	ND	ND			
Cryptosporidium		oocysts/200 L	TT	MCLG = 0	(1)	Range	ND	ND	ND	ND	ND		Human and animal fecal waste
						Average							
Giardia		cysts/200 L	TT	MCLG = 0	(1)	Range	ND	ND	ND	ND	ND		Human and animal fecal waste
						Average							
ORGANIC CHEMICALS													
Synthetic Organic Compounds (SOC)	**(f)**												
1,2,3-Trichloropropane (1,2,3-TCP)		ppt	5	0.7	5	Range	ND	ND	ND	ND	ND		Discharge from industrial and agrichemical factories; byproduct of producing other compounds and pesticides; leaching from hazardous waste sites
						Average							
2,4,5-TP (Silvex)		ppb	50	3	1	Range	ND	ND	ND	ND	ND		Residue of banned herbicide
						Average							
2,4-D		ppb	70	20	10	Range	ND	ND	ND	ND	ND		Runoff from herbicide used on row crops, rangeland, lawns, and aquatic weeds
						Average							
Acrylamide		ppm	TT	MCLG = 0	NA	Range	NA	NA	NA	NA	NA		Water treatment chemical impurities
						Average							
Alachlor		ppb	2	4	1	Range	ND	ND	ND	ND	ND		Runoff from herbicide used on row crops
						Average							
Atrazine		ppb	1	0.15	0.5	Range	ND	ND	ND	ND	ND		Runoff from herbicide used on row crops and along railroad and highway right-of-ways
						Average							
Bentazon		ppb	18	200	2	Range	ND	ND	ND	ND	ND		Runoff/leaching from herbicide used on beans, peppers, corn, peanuts, rice, and ornamental grasses
						Average							
Benzo(a)pyrene		ppt	200	7	100	Range	ND	ND	ND	ND	ND		Leaching from linings and coatings of water storage tanks and distribution mains
						Average							
Carbofuran		ppb	18	0.7	5	Range	ND	ND	ND	ND	ND		Leaching of soil fumigant used on rice, alfalfa, and grape vineyards
						Average							
Chlordane		ppt	100	30	100	Range	ND	ND	ND	ND	ND		Residue of banned insecticide
						Average							
Dalapon		ppb	200	790	10	Range	ND	ND	ND	ND	ND		Runoff from herbicide used on right-of-ways, and crops and landscape maintenance
						Average							
Di(2-ethylhexyl)adipate		ppb	400	200	5	Range	ND	ND	ND	ND	ND		Discharge from chemical factories
						Average							
Di(2-ethylhexyl)phthalate		ppb	4	12	3	Range	ND	ND	ND	ND	ND		Discharge from rubber and chemical factories; inert ingredient in pesticides
						Average							
Dibromochloropropane (DBCP)		ppt	200	1.7	10	Range	ND	ND	ND	ND	ND		Banned nematocide that may still be present in soils due to runoff/leaching
						Average							
Dinoseb		ppb	7	14	2	Range	ND	ND	ND	ND	ND		Runoff from herbicide used on soybeans, vegetables, and fruits
						Average							
Dioxin (2,3,7,8-TCDD)		ppq	30	0.05	5	Range	ND	ND	ND	ND	ND		Waste incineration emissions; chemical factory discharge
						Average							
Diquat		ppb	20	6	4	Range	ND	ND	ND	ND	ND		Runoff from herbicide used for terrestrial and aquatic weeds
						Average							

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Endothall	ppb	100	94	45	Range Average	ND	ND	ND	ND	ND		Runoff from herbicide used for terrestrial and aquatic weeds; defoliant
Endrin	ppb	2	0.3	0.1	Range Average	ND	ND	ND	ND	ND		Residue of banned insecticide and rodenticide
Epichlorohydrin	ppm	TT	MCLG = 0	NA	Range Average	NA	NA	NA	NA	NA		Water treatment chemical impurities
Ethylene Dibromide (EDB)	ppt	50	10	20	Range Average	ND	ND	ND	ND	ND		Petroleum refinery discharges; underground gas tank leaks; banned nematocide that maybe still present in soils due to runoff and leaching
Glyphosate	ppb	700	900	25	Range Average	ND	ND	ND	ND	ND		Runoff from herbicide use
Heptachlor	ppt	10	8	10	Range Average	ND	ND	ND	ND	ND		Residue of banned insecticide
Heptachlor Epoxide	ppt	10	6	10	Range Average	ND	ND	ND	ND	ND		Breakdown product of heptachlor
Hexachlorobenzene	ppb	1	0.03	0.5	Range Average	ND	ND	ND	ND	ND		Discharge from metal refineries and agrichemicals factories; wastewater chlorination reaction byproduct
Hexachlorocyclopentadiene	ppb	50	2	1	Range Average	ND	ND	ND	ND	ND		Discharge from chemical factories
Lindane	ppt	200	32	200	Range Average	ND	ND	ND	ND	ND		Runoff/leaching from insecticide used on cattle, lumber, and gardens
Methoxychlor	ppb	30	0.09	10	Range Average	ND	ND	ND	ND	ND		Runoff/leaching from insecticide uses on fruits, vegetables, alfalfa, and livestock
Molinate (Ordram)	ppb	20	1	2	Range Average	ND	ND	ND	ND	ND		Runoff/leaching from herbicide used on rice
Oxamyl (Vydate)	ppb	50	26	20	Range Average	ND	ND	ND	ND	ND		Runoff/leaching from insecticide uses
Pentachlorophenol	ppb	1	0.3	0.2	Range Average	ND	ND	ND	ND	ND		Discharge from wood preserving factories other insecticidal and herbicidal uses
Picloram	ppb	500	166	1	Range Average	ND	ND	ND	ND	ND		Herbicide runoff
Polychlorinated Biphenyls (PCBs)	ppt	500	90	500	Range Average	ND	ND	ND	ND	ND		Runoff from landfills; discharge of waste chemicals
Simazine	ppb	4	4	1	Range Average	ND	ND	ND	ND	ND		Herbicide runoff
Thiobencarb	ppb	70	42	1	Range Average	ND	ND	ND	ND	ND		Runoff/leaching from herbicide used on rice
Toxaphene	ppb	3	0.03	1	Range Average	ND	ND	ND	ND	ND		Runoff/leaching from insecticide used on cotton and cattle
Volatile Organic Compounds												
1,1,1-Trichloroethane	ppb	200	1,000	0.5	Range Average	ND	ND	ND	ND	ND		Metal degreasing site discharge; manufacture of food wrappings
1,1,2,2-Tetrachloroethane	ppb	1	0.1	0.5	Range Average	ND	ND	ND	ND	ND		Discharge from industrial and agrichemical factories; solvent used in production of TCE, pesticides, varnish, and lacquers
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	ppm	1.2	4	0.01	Range Average	ND	ND	ND	ND	ND		Discharge from metal degreasing sites and other factories; dry cleaning solvent; refrigerant
1,1,2-Trichloroethane	ppb	5	0.3	0.5	Range Average	ND	ND	ND	ND	ND		Discharge from industrial chemical factories
1,1-Dichloroethane	ppb	5	3	0.5	Range Average	ND	ND	ND	ND	ND		Extraction and degreasing solvent; fumigant
1,1-Dichloroethylene	ppb	6	10	0.5	Range Average	ND	ND	ND	ND	ND		Discharge from industrial chemical factories
1,2,4-Trichlorobenzene	ppb	5	5	0.5	Range Average	ND	ND	ND	ND	ND		Discharge from textile-finishing factories
1,2-Dichlorobenzene	ppb	600	600	0.5	Range Average	ND	ND	ND	ND	ND		Discharge from industrial chemical factories
1,2-Dichloroethane	ppt	500	400	500	Range Average	ND	ND	ND	ND	ND		Discharge from industrial chemical factories

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1,2-Dichloropropane	ppb	5	0.5	0.5	Range	ND	ND	ND	ND	ND		Industrial chemical factory discharge; primary component of some fumigants
					Average							
1,3-Dichloropropene	ppt	500	200	500	Range	ND	ND	ND	ND	ND		Runoff/leaching from nematocide used on croplands
					Average							
1,4-Dichlorobenzene	ppb	5	6	0.5	Range	ND	ND	ND	ND	ND		Discharge from industrial chemical factories
					Average							
Benzene	ppb	1	0.15	0.5	Range	ND	ND	ND	ND	ND		Plastics factory discharge; gas tanks and landfill leaching
					Average							
Carbon Tetrachloride	ppt	500	100	500	Range	ND	ND	ND	ND	ND		Discharge from chemical plants and other industrial wastes
					Average							
cis -1,2-Dichloroethylene	ppb	6	100	0.5	Range	ND	ND	ND	ND	ND		Industrial chemical factory discharge; byproduct of TCE and PCE biodegradation
					Average							
Dichloromethane (Methylene Chloride)	ppb	5	4	0.5	Range	ND	ND	ND	ND	ND		Discharge from pharmaceutical and chemical factories; insecticide
					Average							
Ethylbenzene	ppb	300	300	0.5	Range	ND	ND	ND	ND	ND		Petroleum refinery discharge; industrial chemical factories
					Average							
Methyl-*tert* -butyl ether (MTBE)	ppb	13	13	3	Range	ND	ND	ND	ND	ND		Gasoline discharge from watercraft engines
					Average							
Monochlorobenzene	ppb	70	70	0.5	Range	ND	ND	ND	ND	ND		Discharge from industrial and agrichemical factories, and dry cleaners
					Average							
Styrene	ppb	100	0.5	0.5	Range	ND	ND	ND	ND	ND		Rubber and plastics factories discharge; landfill leaching
					Average							
Tetrachloroethylene (PCE)	ppb	5	0.06	0.5	Range	ND	ND	ND	ND	ND		Discharge from factories, dry cleaners, and auto shops
					Average							
Toluene	ppb	150	150	0.5	Range	ND	ND	ND	ND	ND		Discharge from petroleum and chemical refineries
					Average							
trans -1,2-Dichloroethylene	ppb	10	60	0.5	Range	ND	ND	ND	ND	ND		Industrial chemical factory discharge; byproduct of TCE and PCE biodegradation
					Average							
Trichloroethylene (TCE)	ppb	5	1.7	0.5	Range	ND	ND	ND	ND	ND		Discharge from metal degreasing sites and other factories
					Average							
Trichlorofluoromethane (Freon-11)	ppb	150	1,300	5	Range	ND	ND	ND	ND	ND		Industrial factory discharge; degreasing solvent; propellant and refrigerant
					Average							
Vinyl Chloride	ppt	500	50	500	Range	ND	ND	ND	ND	ND		Leaching from PVC piping; plastic factory discharge; byproduct of TCE and PCE biodegradation
					Average							
Xylenes	ppm	1.750	1.8	0.0005	Range	ND	ND	ND	ND	ND		Discharge from petroleum and chemical refineries; fuel solvent
					Average							
INORGANIC CHEMICALS												
Aluminum (g)	ppb	1,000	600	50	Range	ND - 260	ND - 220	ND - 93	ND - 200	80 - 210		Residue from water treatment process; runoff and leaching from natural deposits
					Highest RAA	137	116	ND	108	149		
Antimony	ppb	6	1	6	Range	ND	ND	ND	ND	ND		Petroleum refinery discharges; fire retardants; solder; electronics
					Average							
Arsenic	ppb	10	0.004	2	Range	ND	ND	ND	ND	ND		Natural deposits erosion, glass and electronics production wastes
					Average							
Asbestos (h)	MFL	7	7	0.2	Range	ND	ND	ND	ND	ND		Asbestos cement pipes internal corrosion; runoff and leaching from natural deposits
					Average							
Barium	ppb	1,000	2,000	100	Range	107	ND	ND	ND	105		Oil and metal refineries discharge; natural deposits erosion
					Average							
Beryllium	ppb	4	1	1	Range	ND	ND	ND	ND	ND		Discharge from metal refineries, aerospace, and defense industries
					Average							
Cadmium	ppb	5	0.04	1	Range	ND	ND	ND	ND	ND		Internal corrosion of galvanized pipes; discharge from electroplating, industrial factories, and metal refineries; runoff from waste batteries and paints; natural deposits erosion
					Average							
Chromium	ppb	50	MCLG = 100	10	Range	ND	ND	ND	ND	ND		Discharge from steel and pulp mills; natural deposits erosion
					Average							
Copper (i)	ppm	AL = 1.3	0.3	0.05	Range	ND	ND	ND	ND	ND		Internal corrosion of household pipes; runoff and leaching from natural deposits; leaching from wood preservatives
					Average							
Cyanide	ppb	150	150	100	Range	ND	ND	ND	ND	ND		Discharge from steel/metal, plastic, and fertilizer factories
					Average							

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Fluoride (j)	ppm	2.0	1	0.1	Range	0.5 - 0.9	0.4 - 0.8	0.1 - 0.9	0.6 - 0.9	0.6 - 0.8	0.2 - 0.9	Runoff and leaching from natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
					Average	0.7	0.7	0.8	0.7	0.7	0.7	
Lead	ppb	AL = 15	0.2	5	Range	ND	ND	ND	ND	ND		Internal corrosion of household water plumbing systems; industrial manufacturers' discharge; runoff and leaching from natural deposits
					Average							
Mercury	ppb	2	1.2	1	Range	ND	ND	ND	ND	ND		Erosion of natural deposits; factory discharge; landfill runoff
					Average							
Nickel	ppb	100	12	10	Range	ND	ND	ND	ND	ND		Erosion of natural deposits; discharge from metal factories
					Average							
Nitrate (as Nitrogen)	ppm	10	10	0.4	Range	ND	ND	0.6	ND	ND		Runoff and leaching from fertilizer use; septic tank and sewage; natural deposits erosion
					Average							
Nitrite (as Nitrogen)	ppm	1	1	0.4	Range	ND	ND	ND	ND	ND		Runoff and leaching from fertilizer use; septic tank and sewage; natural deposits erosion
					Average							
Perchlorate	ppb	6	1	4	Range	ND	ND	ND	ND	ND		Industrial waste discharge
					Average							
Selenium	ppb	50	30	5	Range	ND	ND	ND	ND	ND		Refineries, mines, and chemical waste discharge; runoff from livestock lots
					Average							
Thallium	ppb	2	0.1	1	Range	ND	ND	ND	ND	ND		Leaching from ore processing; discharge from electronics, glass, and pharmaceutical factories
					Average							
RADIOLOGICALS												
Gross Alpha Particle Activity	pCi/L	15	MCLG = 0	3	Range	ND - 3	ND	ND - 4	ND - 3	ND		Runoff/leaching from natural deposits
					Average	ND		ND	ND			
Gross Beta Particle Activity	pCi/L	50	MCLG = 0	4	Range	ND - 7	ND	ND - 4	ND - 5	ND - 6		Decay of natural and man-made deposits
					Average	ND		ND	ND	4		
Radium-226	pCi/L	NA	0.05	1	Range	ND	ND	ND	ND	ND		Erosion of natural deposits
					Average							
Radium-228	pCi/L	NA	0.019	1	Range	ND	ND	ND	ND - 1	ND - 2		Erosion of natural deposits
					Average				ND	ND		
Combined Radium-226 + 228	pCi/L	5	MCLG = 0	NA	Range	ND	ND	ND	ND	ND		Erosion of natural deposits
					Average							
Strontium-90	pCi/L	8	0.35	2	Range	ND	ND	ND	ND	ND		Decay of natural and man-made deposits
					Average							
Tritium	pCi/L	20,000	400	1,000	Range	ND	ND	ND	ND	ND		Decay of natural and man-made deposits
					Average							
Uranium	pCi/L	20	0.43	1	Range	1 - 3	ND - 3	ND - 2	ND - 2	1 - 3		Erosion of natural deposits
					Average	2	ND	ND	2	2		
DISINFECTION BYPRODUCTS, DISINFECTANT RESIDUALS, AND DISINFECTION BYPRODUCT PRECURSORS (k)												
Total Trihalomethanes (TTHM) (Plant Core Locations and Distribution System)	ppb	80	NA	1.0	Range	19 - 27	12 - 17	14 - 22	13 - 24	20 - 26	10 - 31	Byproduct of drinking water chlorination
					Highest LRAA	25	14	18	23	24	32	
Sum of Five Haloacetic Acids (HAA5) (Plant Core Locations and Distribution System)	ppb	60	NA	1.0	Range	1.8 - 8.0	1.9 - 4.9	2.2 - 14	3.5 - 12	3.3 - 7.3	1.1 - 14	Byproduct of drinking water chlorination
					Highest LRAA	5.9	4.6	9.1	8.5	6.2	9.1	
Total Chlorine Residual	ppm	MRDL = 4.0	MRDLG = 4.0	(0.05)	Range						1.4 - 3.0	Drinking water disinfectant added for treatment
					Highest RAA						2.4	
Bromate (l)	ppb	10	0.1	1.0	Range	ND - 1.3	1.4 - 6.0	ND - 12	ND - 5.6	ND - 4.2		Byproduct of drinking water ozonation
					Highest RAA	1.9	4.4	4.3	2.5	2.0		
Total Organic Carbon (TOC)	ppm	TT	NA	0.30	Range	2.2 - 2.7	1.8 - 2.3	1.7 - 3.1	1.9 - 2.6	2.1 - 2.6		Various natural and man-made sources; TOC is a precursor for the formation of disinfection byproducts
					Highest RAA	2.4	2.2	2.1	2.3	2.4		
SECONDARY STANDARDS—Aesthetic Standards												
Aluminum (g)	ppb	200	600	50	Range	ND - 260	ND - 220	ND - 93	ND - 200	80 - 210		Residue from water treatment process; runoff and leaching from natural deposits
					Highest RAA	137	116	ND	108	149		
Chloride	ppm	500	NA	NA	Range	93 - 94	51 - 54	60 - 62	81 - 92	93		Runoff/leaching from natural deposits; seawater influence
					Average	94	52	61	86			
Color	Color Units	15	NA	NA	Range	1	1 - 3	1 - 3	1 - 2	1		Naturally-occurring organic materials
					Average		2	2	2			
Copper (i)	ppm	1.0	0.3	0.05	Range	ND	ND	ND	ND	ND		Internal corrosion of household pipes; runoff/leaching from natural deposits; wood preservatives leaching
					Average							
Foaming Agents - Methylene Blue Active Substances (MBAS)	ppb	500	NA	NA	Range	ND	ND	ND	ND	ND		Municipal and industrial waste discharges
					Average							

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Iron	ppb	300	NA	100	Range	ND	ND	ND	ND	ND		Leaching from natural deposits; industrial wastes
					Average							
Manganese	ppb	50	NL = 500	20	Range	ND	ND	ND	ND	ND		Leaching from natural deposits
					Average							
MTBE	ppb	5	13	3	Range	ND	ND	ND	ND	ND		Gasoline discharge from watercraft engines
					Average							
Odor Threshold	TON	3	NA	1	Range	2	2	2	2	2		Naturally-occurring organic materials
					Average							
Silver	ppb	100	NA	10	Range	ND	ND	ND	ND	ND		Industrial discharges
					Average							
Specific Conductance	µS/cm	1,600	NA	NA	Range	964 - 975	451 - 468	439 - 455	796 - 956	963 - 968		Substances that form ions in water; seawater influence
					Average	970	460	447	876	966		
Sulfate	ppm	500	NA	0.5	Range	215 - 217	53 - 56	41 - 43	152 - 208	211 - 215		Runoff/leaching from natural deposits; industrial wastes
					Average	216	54	42	180	213		
Thiobencarb	ppb	1	42	1	Range	ND	ND	ND	ND	ND		Runoff/leaching from rice herbicide
					Average							
Total Dissolved Solids, Filterable (TDS) (m)	ppm	1,000	NA	NA	Range	582 - 603	255 - 264	240 - 255	472 - 588	587 - 593		Runoff/leaching from natural deposits
					Average	592	260	248	530	590		
Turbidity	NTU	5	NA	0.1	Range	ND	ND	ND	ND	ND		Soil runoff
					Average							
Zinc	ppm	5.0	NA	0.05	Range	ND	ND	ND	ND	ND		Runoff/leaching from natural deposits; industrial wastes
					Average							
OTHER PARAMETERS												
General Minerals												
Alkalinity (as $CaCO_3$)	ppm	NA	NA	(1)	Range	117 - 120	79 - 86	75 - 76	105 - 121	118 - 119		Runoff/leaching of natural deposits; carbonate, bicarbonate, hydroxide, and occasionally borate, silicate, and phosphate
					Average	118	82	76	113	118		
Calcium	ppm	NA	NA	(0.1)	Range	65 - 67	25 - 27	21 - 22	52 - 72	65		Runoff/leaching from natural deposits
					Average	66	26	22	62			
Hardness (as $CaCO_3$)	ppm	NA	NA	(1)	Range	261 - 269	107 - 110	84 - 94	211 - 273	256 - 268		Runoff/leaching from natural deposits; sum of polyvalent cations, generally magnesium and calcium present in the water
					Average	265	108	89	242	262		
Magnesium	ppm	NA	NA	(0.01)	Range	25 - 26	11 - 12	9.7 - 10	20 - 26	25 - 26		Runoff/leaching from natural deposits
					Average	26	12	9.8	23	26		
Potassium	ppm	NA	NA	(0.2)	Range	4.5 - 4.7	2.5 - 2.6	2.5	4.0 - 4.8	4.5 - 4.6		Salt present in the water; naturally-occurring
					Average	4.6	2.6		4.4	4.6		
Sodium	ppm	NA	NA	(1)	Range	93 - 98	46 - 48	51 - 55	76 - 98	93 - 97		Salt present in the water; naturally-occurring
					Average	96	47	53	87	95		
Unregulated Contaminants												
Boron	ppb	NL = 1,000	NA	100	Range	130	170	140	130	130		Runoff/leaching from natural deposits; industrial wastes
					Average							
Chlorate	ppb	NL = 800	NA	20	Range	69	27	27	34	76		Byproduct of drinking water chlorination; industrial processes
					Average							
Chromium VI	ppb	NA	0.02	1	Range	ND	ND	ND	ND	ND		Runoff/leaching from natural deposits; discharge from industrial wastes
					Average							
Vanadium	ppb	NL = 50	NA	3	Range	ND	ND	ND	ND	ND		Naturally-occurring; industrial waste discharge
					Average							
Dichlorodifluoromethane (Freon-12)	ppb	NL = 1,000	NA	0.5	Range	ND	ND	ND	ND	ND		Industrial waste discharge
					Average							
N-Nitrosodimethylamine (NDMA)	ppt	NL = 10	3	(2)	Range	3.1	2.0	2.5	4.2	ND	ND - 5.2	Byproduct of drinking water chloramination; industrial processes
Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) (n, o)												
Perfluorooctanoic acid (PFOA)	ppt	NL = 5.1	NA	4	Range	ND	ND	ND	ND	ND		Industrial chemical factory discharges; runoff/leaching from landfills; used in fire-retarding foams and various industrial processes
					Average							
Perfluorooctanesulfonic acid (PFOS)	ppt	NL = 6.5	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
Perfluorononanoic acid (PFNA)	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							

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Treatment Plant Effluents and Distribution System

Parameter	Units	State (Federal) MCL	PHG	State DLR/CCRDL (RL)	Range Average	Treatment Plant Effluent *						Major Sources in Drinking Water
						Diemer Plant	Jensen Plant	Mills Plant	Skinner Plant	Weymouth Plant	Distribution System	
Perfluorohexanesulfonic acid (PFHxS)	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
Perfluoroheptanoic acid (PFHpA)	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
Perfluorobutanesulfonic acid (PFBS)	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
Perfluorodecanoic acid (PFDA)	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
Perfluorododecanoic acid (PFDoA)	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
Perfluorohexanoic acid (PFHxA)	ppt	NA	NA	4	Range	ND	2.5	2.6	ND	ND		
					Average							
Perfluorotetradecanoic acid (PFTeDA)	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
Perfluorotridecanoic acid (PFTrDA)	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
Perfluoroundecanoic acid (PFUnA)	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
4,8-dioxa-3H-perfluorononanoate (ADONA)	ppt	NA	NA	2	Range	ND	ND	ND	ND	ND		
					Average							
F-53B Major (11Cl-PF3OUdS)	ppt	NA	NA	2	Range	ND	ND	ND	ND	ND		
					Average							
F-53B Minor (9Cl-PF3ONS)	ppt	NA	NA	2	Range	ND	ND	ND	ND	ND		
					Average							
GenX (HFPO-DA)	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
N-ethyl Perfluorooctanesulfonamidoacetic acid	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
N-methyl Perfluorooctanesulfonamidoacetic acid	ppt	NA	NA	4	Range	ND	ND	ND	ND	ND		
					Average							
Miscellaneous **(o)**												
Calcium Carbonate Precipitation Potential (CCPP) (as $CaCO_3$) (p)	ppm	NA	NA	NA	Range	2.6 - 11	1.1 - 3.4	0.85 - 2.2	0.78 - 11	3.3 - 9.9		Elemental balance in water; affected by temperature, other factors
					Average	8.1	2.2	1.6	6.4	7.4		
Corrosivity (as Aggressiveness Index) (q)	AI	NA	NA	NA	Range	12.3 - 12.4	12.1 - 12.2	11.9 - 12.1	12.3 - 12.5	12.4		Elemental balance in water; affected by temperature, other factors
					Average	12.4	12.1	12.0	12.4			
Corrosivity (as Saturation Index) (r)	SI	NA	NA	NA	Range	0.49 - 0.69	0.32 - 0.48	0.27 - 0.28	0.39 - 0.73	0.48 - 0.65		Elemental balance in water; affected by temperature, other factors
					Average	0.59	0.40	0.28	0.56	0.56		
pH	pH Units	NA	NA	NA	Range	8.1	8.4	8.3 - 8.5	8.1	8.1		Not applicable
					Average			8.4				
Radon	pCi/L	NA	NA	100	Range	ND	ND	ND	ND	ND		Gas produced by the decay of naturally-occurring uranium in soil and water
					Average							
Total Dissolved Solids, Calculated (TDS) (s)	ppm	1,000	NA	NA	Range	402 - 595	248 - 273	244 - 295	334 - 612	450 - 599		Runoff/leaching from natural deposits
					Average	563	258	263	475	565		
Ethyl-*tert*-butyl ether (ETBE)	ppb	NA	NA	3	Range	ND	ND	ND	ND	ND		Used as gasoline additive
					Average							
tert-Amyl-methyl ether (TAME)	ppb	NA	NA	3	Range	ND	ND	ND	ND	ND		Used as gasoline additive
					Average							

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							Diemer Plant	Jensen Plant	Mills Plant	Skinner Plant	Weymouth Plant		
Sum of Five Haloacetic Acids (HAA5)	(t)	ppb	60	NA	1.0	Range	1.1 - 4.0	1.4 - 3.0	2.1 - 7.6	2.9 - 8.6	3.4 - 5.7		Byproduct of drinking water chlorination
						Average	2.5	2.5	5.7	6.2	4.5		
Total Trihalomethanes (TTHM)	(t)	ppb	80	NA	1.0	Range	13 - 32	8.2 - 22	12 - 29	11 - 40	15 - 36		Byproduct of drinking water chlorination
						Average	22	11	18	19	22		

DEFINITION OF TERMS AND FOOTNOTES

*** As a wholesale water system, Metropolitan provides its member agencies with relevant source water information and monitoring results that they may need for their annual water quality report. Metropolitan's compliance with state or federal regulations is determined at the treatment plant effluent locations and/or distribution system, or plant influent per frequency stipulated in Metropolitan's state-approved monitoring plan, and is based on TT, RAA, or LRAA, as appropriate. Data above Metropolitan's laboratory reporting limit (RL) but below the state DLR are reported as ND in this report; these data are available upon request. Metropolitan was in compliance with all primary and secondary drinking water regulations for the currrent monitoring period.**

Note: Metropolitan monitors the distribution system for constituents under the revised Total Coliform Rule (TCR), Water Fluoridation Standards, and Disinfectants/Disinfection Byproducts Rule (TTHMs, HAA5, and total chlorine residual). Constituents with grayed out areas in the distribution system column are routinely monitored at treatment plant effluents and not in the distribution system.

Definition of Terms

AI	Aggressiveness Index	MCL	Maximum Contaminant Level	ppt	Parts per trillion or nanograms per liter (ng/L)
AL	Action Level	MCLG	Maximum Contaminant Level Goal	RAA	Running Annual Average; highest RAA is the highest of all
Average	Arithmetic mean	MFL	Million Fibers per Liter		running Annual Averages calculated as an average of all the
$CaCO_3$	Calcium Carbonate	MRDL	Maximum Residual Disinfectant Level		samples collected within a 12-month period
CCPP	Calcium Carbonate Precipitation Potential	MRDLG	Maximum Residual Disinfectant Level Goal	Range	Results based on minimum and maximum values; range
CCRDL	Consumer Confidence Report Detection Level	NA	Not Applicable		and average values are the same if a single value is reported
CFE	Combined Filter Effluent	ND	Not Detected at or above DLR or RL		for samples collected once or twice annually
CFU	Colony-Forming Units	NL	Notification Level to SWRCB	RL	Reporting Limit
DLR	Detection Limits for Purposes of Reporting	NTU	Nephelometric Turbidity Units	SI	Saturation Index (Langelier)
HAA5	Sum of five haloacetic acids	pCi/L	PicoCuries per Liter	SWRCB	State Water Resources Control Board
HPC	Heterotrophic Plate Count	PFAS	Per- and polyfluoralkyl substances	TDS	Total Dissolved Solids
LRAA	Locational Running Annual Average; highest LRAA	PHG	Public Health Goal	TON	Threshold Odor Number
	is the highest of all Locational Running Annual Averages	ppb	parts per billion or micrograms per liter (µg/L)	TT	Treatment Technique is a required process intended to
	calculated as an average of all samples collected within	ppm	parts per million or milligrams per liter (mg/L)		reduce the level of a contaminant in drinking water
	a 12-month period	ppq	parts per quadrillion or picograms per liter (pg/L)	TTHM	Total Trihalomethanes
				µS/cm	MicroSiemen per centimeter

Footnotes

(a) Metropolitan monitors turbidity at the CFE locations using continuous and grab samples. Turbidity, a measure of cloudiness of the water, is an indicator of treatment performance. Turbidity was in compliance with the TT primary drinking water standard and the secondary drinking water standard of less than 5 NTU.

(b) Per the state's Surface Water Treatment Rule, treatment techniques that remove or inactivate *Giardia* cysts will also remove HPC bacteria, *Legionella* , and viruses. *Legionella* and virus monitoring is not required.

(c) Compliance is based on monthly samples from treatment plant effluents and the distribution system.

(d) The *E. coli* MCL is based on routine and repeat samples testing positive for coliforms and/or *E. coli* , failure to test for *E. coli* , or failure to analyze required repeat samples.

(e) All distribution system samples had detectable total chlorine residuals, so no HPC bacteria analysis was required. Metropolitan monitors HPC bacteria to ensure treatment process efficacy.

(f) Acrylamide and epichlorohydrins are monitored annually. All other SOC data were collected in 2018 and reported once every three-year compliance cycle until the next required triennial monitoring in 2021.

(g) Compliance with the state MCL for aluminum is based on RAA. No exceedances occurred in the Diemer, Jensen, Mills, Skinner, and Weymouth plant effluents.

(h) Data collected in 2020 and reported once every nine-year compliance cycle, until the next samples are collected in 2029.

(i) As a wholesaler, Metropolitan has no retail customers and is not required to collect samples at consumers' taps. However, compliance monitoring under Title 22 is required at plant effluents.

(j) Metropolitan was in compliance with all provisions of the State's fluoridation system requirements. Fluoride feed systems were temporarily out of service during treatment plant shutdowns and/or maintenance work in 2020, resulting in occasional fluoride levels below 0.7 mg/L .

(k) Compliance with the state and federal MCLs is based on RAA or LRAA, as appropriate. Plant core locations for TTHM and HAA5 are service connections specific to each of the treatment plant effluents.

(l) Compliance with the state and federal bromate MCL is based on RAA. No exceedances occurred in the Diemer, Jensen, Mills, Skinner, and Weymouth plant effluents.

(m) Metropolitan's TDS compliance data are based on flow-weighted monthly composite samples collected twice per year (April and October). The 12-month statistical summary of flow-weighted data is reported in "Other Parameters".

(n) All PFAS monitoring results were below the SWRCB established CCRDLs. PFAS results below the laboratory minimum reporting level (MRL) of 2.0 ppt are reported as “ND”.

(o) Data are from voluntary monitoring of constituents and are provided for informational purposes.

(p) Positive CCPP = non-corrosive; tendency to precipitate and/or deposit scale on pipes. Negative CCPP = corrosive; tendency to dissolve calcium carbonate. Reference: Standard Methods (SM2330)

(q) AI >= 12.0 = Non-aggressive water; AI 10.0-11.9 = Moderately aggressive water; AI <= 10.0 = Highly aggressive water. Reference: ANSI/AWWA Standard C400-93 (R98)

(r) Positive SI = non-corrosive; tendency to precipitate and/or deposit scale on pipes. Negative SI = corrosive; tendency to dissolve calcium carbonate. Reference: Standard Methods (SM2330)

(s) Statistical summary represents 12 months of flow-weighted data and values may be different than the TDS reported to meet compliance with secondary drinking water regulations. Metropolitan's calculated TDS goal is ≤ 500 mg/L.

(t) HAA5 and TTHMs noncompliance samples collected at treatment plant effluents.

2020 Water Quality Report to Member Agencies—The Metropolitan Water District of Southern California
Source Waters

Parameter	Units	Range / Average	Source Water *							Major Sources in Drinking Water
			Diamond Valley Lake	Lake Skinner	Lake Havasu	Lake Mathews	Castaic Lake	Lake Perris	Silverwood Lake	
Percent State Water Project	%	Range	100	0 - 82	0	0	100	100	100	Not applicable
		Average		34						
ORGANIC CHEMICALS										
Synthetic Organic Compounds **(a)**										
1,2,3-Trichloropropane (1,2,3-TCP)	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial and agrichemical factories; byproduct of producing other compounds and pesticides; leaching from hazardous waste sites
		Average								
2,4,5-TP (Silvex)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Residue of banned herbicide
		Average								
2,4-D	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on row crops, rangeland, lawns, and aquatic weeds
		Average								
Alachlor	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on row crops
		Average								
Atrazine	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on row crops and along railroad and highway right-of-ways
		Average								
Bentazon	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from herbicide used on beans, peppers, corn, peanuts, rice, and ornamental grasses
		Average								
Benzo(a)pyrene	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Leaching from water storage tank linings and distribution lines
		Average								
Carbofuran	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Leaching of soil fumigant used on rice, alfalfa, and grape vineyards
		Average								
Chlordane	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Residue of banned insecticide
		Average								
Dalapon	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on right-of-ways, and crops and landscape maintenance
		Average								
Di(2-ethylhexyl)adipate	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from chemical factories
		Average								
Di(2-ethylhexyl)phthalate	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from rubber and chemical factories; inert ingredient in pesticides
		Average								
Dibromochloropropane (DBCP)	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Banned nematocide that may still be present in soils due to runoff/leaching
		Average								
Dinoseb	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used on soybeans, vegetables, and fruits
		Average								
Dioxin (2,3,7,8-TCDD)	ppq	Range	ND	ND	ND	ND	ND	ND	ND	Waste incineration emissions; chemical factory discharge
		Average								
Diquat	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used for terrestrial and aquatic weeds
		Average								
Endothall	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide used for terrestrial and aquatic weeds
		Average								
Endrin	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Residue of banned insecticide and rodenticide
		Average								

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Source Waters

Parameter	Units	Range Average	Source Water *							Major Sources in Drinking Water
			Diamond Valley Lake	Lake Skinner	Lake Havasu	Lake Mathews	Castaic Lake	Lake Perris	Silverwood Lake	
Ethylene Dibromide (EDB)	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Petroleum refinery discharges; underground gas tank leaks; banned nematocide that maybe still present in soils due to runoff and leaching
		Average								
Glyphosate	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff from herbicide use
		Average								
Heptachlor	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Residue of banned insecticide
		Average								
Heptachlor Epoxide	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Breakdown product of heptachlor
		Average								
Hexachlorobenzene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from metal refineries and agrichemicals factories; wastewater chlorination reaction byproduct
		Average								
Hexachlorocyclopentadiene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from chemical factories
		Average								
Lindane	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from insecticide used on cattle, lumber, and gardens
		Average								
Methoxychlor	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from insecticide uses on fruits, vegetables, alfalfa, and livestock
		Average								
Molinate (Ordram)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from herbicide used on rice
		Average								
Oxamyl (Vydate)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from insecticide uses
		Average								
Pentachlorophenol	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from wood preserving factories other insecticidal and herbicidal uses
		Average								
Picloram	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Herbicide runoff
		Average								
Polychlorinated Biphenyls (PCBs)	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Runoff from landfills; discharge of waste chemicals
		Average								
Simazine	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Herbicide runoff
		Average								
Thiobencarb	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from herbicide used on rice
		Average								
Toxaphene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from insecticide used on cotton and cattle
		Average								
Volatile Organic Compounds										
1,1,1-Trichloroethane	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Metal degreasing site discharge; manufacture of food wrappings
		Average								
1,1,2,2-Tetrachloroethane	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial and agrichemical factories; solvent used in production of TCE, pesticides, varnish, and lacquers
		Average								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	ppm	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from metal degreasing sites and other factories; dry cleaning solvent; refrigerant
		Average								

2020 Water Quality Report to Member Agencies—The Metropolitan Water District of Southern California
Source Waters

Parameter	Units	Range Average	Source Water *							Major Sources in Drinking Water
			Diamond Valley Lake	Lake Skinner	Lake Havasu	Lake Mathews	Castaic Lake	Lake Perris	Silverwood Lake	
1,1,2-Trichloroethane	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial chemical factories
		Average								
1,1-Dichloroethane	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Extraction and degreasing solvent; fumigant
		Average								
1,1-Dichloroethylene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial chemical factories
		Average								
1,2,4-Trichlorobenzene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from textile-finishing factories
		Average								
1,2-Dichlorobenzene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial chemical factories
		Average								
1,2-Dichloroethane	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial chemical factories
		Average								
1,2-Dichloropropane	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Industrial chemical factory discharge; primary component of some fumigants
		Average								
1,3-Dichloropropene	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from nematocide used on croplands
		Average								
1,4-Dichlorobenzene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial chemical factories
		Average								
Benzene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Plastics factory discharge; gas tanks and landfill leaching
		Average								
Carbon Tetrachloride	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from chemical plants and other industrial wastes
		Average								
cis -1,2-Dichloroethylene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Industrial chemical factory discharge; byproduct of TCE and PCE biodegradation
		Average								
Dichloromethane (Methylene Chloride)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from pharmaceutical and chemical factories
		Average								
Ethylbenzene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Petroleum refinery discharge; industrial chemical factories
		Average								
Methyl-*tert* -butyl ether (MTBE)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Gasoline discharge from watercraft engines
		Average								
Monochlorobenzene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from industrial and agrichemical factories, and dry cleaners
		Average								
Styrene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Rubber and plastics factories discharge; landfill leaching
		Average								
Tetrachloroethylene (PCE)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from factories, dry cleaners, and auto shops
		Average								
Toluene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from petroleum and chemical refineries
		Average								
trans -1,2-Dichloroethylene	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Industrial chemical factory discharge; byproduct of TCE and PCE biodegradation
		Average								

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Source Waters

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			Diamond Valley Lake	Lake Skinner	Lake Havasu	Lake Mathews	Castaic Lake	Lake Perris	Silverwood Lake	
Trichloroethylene (TCE)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from metal degreasing sites and other factories
		Average								
Trichlorofluoromethane (Freon-11)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Industrial factory discharge; degreasing solvent; propellant
		Average								
Vinyl Chloride	ppt	Range	ND	ND	ND	ND	ND	ND	ND	Leaching from PVC piping; plastic factory discharge; byproduct of TCE and PCE biodegradation
		Average								
Xylenes	ppm	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from petroleum and chemical refineries; fuel solvent
		Average								
INORGANIC CHEMICALS										
Aluminum	ppb	Range	ND	ND	ND	72	ND	ND	ND	Residue from water treatment process; natural deposits erosion
		Average								
Antimony	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Petroleum refinery discharges; fire retardants; solder; electronics
		Average								
Arsenic	ppb	Range	2.1	2.1	2.3	2.1	ND	ND	ND	Natural deposits erosion, glass and electronics production wastes
		Average								
Asbestos (b)	MFL	Range	ND	ND	ND	ND	ND	ND	ND	Asbestos cement pipes internal corrosion; natural deposits erosion
		Average								
Barium	ppb	Range	ND	ND	106	105	ND	ND	ND	Oil and metal refineries discharge; natural deposits erosion
		Average								
Beryllium	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from metal refineries, aerospace, and defense industries
		Average								
Cadmium	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Internal corrosion of galvanized pipes; discharge from electroplating, industrial factories, and metal refineries; runoff from waste batteries and paints; natural deposits
		Average								
Chromium	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from steel and pulp mills; natural deposits erosion
		Average								
Copper	ppm	Range	ND	ND	ND	ND	ND	ND	ND	Internal corrosion of household pipes; natural deposits erosion; leaching from wood preservatives
		Average								
Cyanide	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Discharge from steel/metal, plastic, and fertilizer factories
		Average								
Fluoride	ppm	Range	0.1	0.2 - 0.3	0.3	0.3	0.1 - 0.2	0.1	ND - 0.1	Erosion of natural deposits; discharge from fertilizer and aluminum factories
		Average		0.2			0.2		ND	
Lead	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Internal corrosion of household water plumbing systems; industrial manufacturers' discharge; erosion of natural deposits
		Average								
Mercury	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Erosion of natural deposits; factory discharge; landfill runoff
		Average								
Nickel	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Erosion of natural deposits; discharge from metal factories
		Average								
Nitrate (as Nitrogen)	ppm	Range	ND	ND	ND	ND	ND	ND	0.5	Runoff and leaching from fertilizer use; leaching from septic tank and sewage; natural deposits erosion
		Average								

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Source Waters

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Nitrite (as Nitrogen)	ppm	Range	ND	ND	ND	ND	ND	ND	ND	Runoff and leaching from fertilizer use; septic tank and sewage; natural deposits erosion
		Average								
Perchlorate	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Industrial waste discharge
		Average								
Selenium	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Refineries, mines, and chemical waste discharge; runoff from livestock lots
		Average								
Thallium	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Leaching from ore processing; discharge from electronics, glass, and pharmaceutical factories
		Average								
RADIOLOGICALS										
Gross Alpha Particle Activity	pCi/L	Range	ND	ND - 3.0	ND - 3.6	ND - 3.6	ND	ND	ND - 5.0	Erosion of natural deposits
		Average		ND	ND	ND			ND	
Gross Beta Particle Activity	pCi/L	Range	ND - 4.4	ND - 5.5	4.7 - 6.7	4.8 - 7.7	ND	ND	ND	Decay of natural and man-made deposits
		Average	ND	ND	5.5	6.0				
Radium-226	pCi/L	Range	ND	ND	ND	ND	ND	ND	ND	Erosion of natural deposits
		Average								
Radium-228	pCi/L	Range	ND	ND - 1.0	ND	ND	ND	ND	ND	Erosion of natural deposits
		Average		ND						
Combined Radium-226 + 228	pCi/L	Range	ND	ND	ND	ND	ND	ND	ND	Erosion of natural deposits
		Average								
Strontium-90	pCi/L	Range	ND	ND	ND	ND	ND	ND	ND	Decay of natural and man-made deposits
		Average								
Tritium	pCi/L	Range	ND	ND	ND	ND	ND	ND	ND	Decay of natural and man-made deposits
		Average								
Uranium	pCi/L	Range	ND	1.4 - 2.6	2.5 - 2.8	2.8 - 3.4	ND - 1.4	1.3 - 1.4	1.2 - 3.1	Erosion of natural deposits
		Average		1.9	2.7	3.0	1.1	1.4	2.1	
AESTHETIC PARAMETERS (c)										
Aluminum	ppb	Range	ND	ND	ND	72	ND	ND	ND	Residue from water treatment process; natural deposits erosion
		Average								
Chloride	ppm	Range	65 - 69	77 - 88	86	91	47 - 51	74 - 80	56 - 59	Runoff/leaching from natural deposits; seawater influence
		Average	67	82			49	77	58	
Color	Color Units	Range	3 - 5	3	3 - 5	3	5 - 10	5 - 10	10	Naturally-occurring organic materials
		Average	4		4		8	8		
Copper	ppm	Range	ND	ND	ND	ND	ND	ND	ND	Internal corrosion of household pipes; natural deposits erosion; wood preservatives leaching
		Average								
Foaming Agents - Methylene Blue Active Substances (MBAS)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Municipal and industrial waste discharges
		Average								
Iron	ppb	Range	ND	ND	ND	106	ND	ND	ND	Leaching from natural deposits; industrial wastes
		Average								
Manganese	ppb	Range	ND	ND	ND	ND	ND	ND	27	Leaching from natural deposits
		Average								

2020 Water Quality Report to Member Agencies—The Metropolitan Water District of Southern California
Source Waters

Parameter	Units	Range / Average	Source Water *							Major Sources in Drinking Water
			Diamond Valley Lake	Lake Skinner	Lake Havasu	Lake Mathews	Castaic Lake	Lake Perris	Silverwood Lake	
MTBE	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Gasoline discharge from watercraft engines
		Average								
Odor Threshold	TON	Range	2	7	7	10	3	9	5	Naturally-occurring organic materials
		Average								
Silver	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Industrial discharges
		Average								
Specific Conductance	µS/cm	Range	463 - 477	728 - 907	928 - 944	923 - 945	417 - 429	478 - 528	401 - 422	Substances that form ions in water; seawater influence
		Average	470	818	936	934	423	503	412	
Sulfate	ppm	Range	44 - 47	142 - 199	206 - 212	214 - 215	49 - 51	40 - 42	34 - 38	Runoff/leaching from natural deposits; industrial wastes
		Average	46	170	209	214	50	41	36	
Thiobencarb	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from rice herbicide
		Average								
Total Dissolved Solids (TDS)	ppm	Range	257 - 258	446 - 571	596 - 601	593 - 604	242 - 244	265 - 290	236 - 242	Runoff/leaching from natural deposits
		Average	258	508	598	598	243	278	239	
Turbidity	NTU	Range	0.4 - 1.0	0.6 - 0.7	0.4 - 0.6	0.7 - 2.2	0.6 - 0.7	0.5 - 1.0	0.5 - 1.1	Soil runoff
		Average	0.7	0.7	0.5	1.4	0.6	0.8	0.8	
Zinc	ppm	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from natural deposits; industrial wastes
		Average								
OTHER PARAMETERS										
Microbiological										
Total Coliform Bacteria	MPN/100 mL	Range	6 - 4,100	40 - 20,000	23 - 140,000	20 - 3,700	NC	66 - 20,000	8 - 3,700	Naturally present in the environment
		Median	49	440	690	440		360	190	
Escherichia coli (E. coli)	MPN/100 mL	Range	ND - 5	ND - 7	ND - 6	ND - 160	NC	ND - 83	ND - 10	Human and animal fecal waste
		Median	ND	1	ND	5		1	3	
General Minerals										
Alkalinity (as $CaCO_3$)	ppm	Range	74 - 79	110 - 129	132 - 134	122	75 - 76	83 - 90	79 - 80	Runoff/leaching of natural deposits; carbonate, bicarbonate, hydroxide, and occasionally borate, silicate, and phosphate
		Average	76	120	133		76	86	80	
Calcium	ppm	Range	21 - 22	49 - 68	70 - 73	64	25 - 27	23 - 25	21	Runoff/leaching from natural deposits
		Average	22	58	72		26	24		
Hardness (as $CaCO_3$)	ppm	Range	94 - 99	196 - 252	264 - 277	254 - 255	109 - 111	100 - 102	80 - 91	Runoff/leaching from natural deposits; sum of polyvalent cations, generally magnesium and calcium present in the water
		Average	96	224	270	254	110	101	86	
Magnesium	ppm	Range	11 - 12	19 - 25	25 - 26	25	11	12 - 13	8.8 - 10	Runoff/leaching from natural deposits
		Average	12	22	26			12	9.4	
Potassium	ppm	Range	3.0 - 3.4	3.8 - 4.6	4.5 - 4.6	4.5	2.4 - 2.6	3.2 - 3.4	2.4 - 2.5	Salt present in the water; naturally-occurring
		Average	3.2	4.2	4.6		2.5	3.3	2.4	
Sodium	ppm	Range	49 - 54	70 - 88	87 - 90	89	40	55 - 59	46 - 47	Salt present in the water; naturally-occurring
		Average	52	79	88			57	46	
Unregulated Contaminants										
Boron	ppb	Range	150	130	130	120	170	160	150	Runoff/leaching from natural deposits; industrial wastes
		Average								

2020 Water Quality Report to Member Agencies—The Metropolitan Water District of Southern California
Source Waters

Parameter	Units	Range / Average	Source Water *							Major Sources in Drinking Water
			Diamond Valley Lake	Lake Skinner	Lake Havasu	Lake Mathews	Castaic Lake	Lake Perris	Silverwood Lake	
Chromium VI	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Runoff/leaching from natural deposits; discharge from industrial waste factories
		Average								
Dichlorodifluoromethane (Freon-12)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Industrial waste discharge
		Average								
Ethyl-*tert*-butyl ether (ETBE)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Used as gasoline additive
		Average								
tert-Amyl-methyl ether (TAME)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Used as gasoline additive
		Average								
Vanadium	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Naturally-occurring; industrial waste discharge
		Average								
Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) (d)										
Perfluorooctanoic acid (PFOA)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	Industrial chemical factory discharges; runoff/leaching from landfills; used in fire-retarding foams and various industrial processes
		Average								
Perfluorooctanesulfonic acid (PFOS)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
Perfluorononanoic acid (PFNA)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
Perfluorohexanesulfonic acid (PFHxS)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
Perfluoroheptanoic acid (PFHpA)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
Perfluorobutanesulfonic acid (PFBS)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
Perfluorodecanoic acid (PFDA)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
Perfluorododecanoic acid (PFDoA)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
Perfluorohexanoic acid (PFHxA)	ppt	Range	2.5	ND	NC	ND	2.4	3.7	2.4	
		Average								
Perfluorotetradecanoic acid (PFTeDA)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
Perfluorotridecanoic acid (PFTrDA)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
Perfluoroundecanoic acid (PFUnA)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
4,8-dioxa-3H-perfluorononanoate (ADONA)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
F-53B Major (11Cl-PF3OUdS)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
F-53B Minor (9Cl-PF3ONS)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								

2020 Water Quality Report to Member Agencies—The Metropolitan Water District of Southern California
Source Waters

Parameter	Units	Range / Average	Source Water *							Major Sources in Drinking Water
			Diamond Valley Lake	Lake Skinner	Lake Havasu	Lake Mathews	Castaic Lake	Lake Perris	Silverwood Lake	
GenX (HFPO-DA)	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
N-ethyl Perfluorooctanesulfonamidoacetic acid	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
N-methyl Perfluorooctanesulfonamidoacetic acid	ppt	Range	ND	ND	NC	ND	ND	ND	ND	
		Average								
Miscellaneous										
Ethyl-tert-butyl ether (ETBE)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Used as gasoline additive
		Average								
pH	pH Units	Range	8.4 - 9.3	8.1 - 8.2	8.1 - 8.2	8.2	7.4 - 7.8	8.3 - 8.4	8.0 - 8.2	Not applicable
		Average	8.8	8.2	8.1		7.6	8.4	8.1	
Radon	pCi/L	Range	ND	ND	ND	ND	ND	ND	ND	Gas produced by the decay of naturally-occurring uranium in soil and water
		Average								
tert-Amyl-methyl ether (TAME)	ppb	Range	ND	ND	ND	ND	ND	ND	ND	Used as gasoline additive
		Average								
Total Organic Carbon (TOC)	ppm	Range	2.9 - 3.2	3.0 - 3.2	2.9 - 3.4	3.2 - 3.3	2.5 - 2.8	3.9 - 4.2	3.4	Various natural and man-made sources; TOC is a precursor for the formation of disinfection byproducts
		Average	3.1	3.1	3.2	3.2	2.7	4.1		

DEFINITION OF TERMS AND FOOTNOTES

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Definition of Terms

Average	Arithmetic mean	PHG	Public Health Goal
$CaCO_3$	Calcium Carbonate	ppb	Parts per billion or micrograms per liter (µg/L)
CCRDL	Consumer Confidence Report Detection Level	ppm	Parts per million or milligrams per liter (mg/L)
DLR	Detection Limits for Purposes of Reporting	ppq	Parts per quadrillion or picograms per liter (pg/L)
MCL	Maximum Contaminant Level	ppt	Parts per trillion or nanograms per liter (ng/L)
MFL	Million Fibers per Liter	Range	Results based on minimum and maximum values; range and average values are the same if a single value is reported for samples collected once or twice annually
MPN	Most Probable Number		
NC	Not Collected		
ND	Not Detected at or above DLR or RL	SWRCB	State Water Resources Control Board
NTU	Nephelometric Turbidity Units	TON	Threshold Odor Number
pCi/L	PicoCuries per Liter	µS/cm	MicroSiemen per centimeter
PFAS	Per- and polyfluoralkyl substances		

Footnotes

(a) Synthetic organic compounds (SOC) data are from samples collected in 2018. Metropolitan's next required triennial monitoring is in 2021.

(b) Data collected in 2020 and reported once every nine-year compliance cycle, until the next samples are collected in 2029.

(c) Aesthetic parameters are monitored in source and treated waters, as appropriate, to comply with Secondary Drinking Water Standards criteria.

(d) All PFAS monitoring results were below the SWRCB established CCRDLs. PFAS results below the laboratory minimum reporting level (MRL) of 2.0 ppt are reported as “ND”.

2020 Water Quality Report to Member Agencies—The Metropolitan Water District of Southern California
Treatment Plant Influents

Parameter	Units	Range / Average	Treatment Plant Influent * Diemer Plant	Jensen Plant	Mills Plant	Skinner Plant	Weymouth Plant	Major Sources in Drinking Water
Percent State Water Project	%	Range	0 - 94	100	100	0 - 84	0 - 90	Not applicable
		Average	9			32	10	
COMPLIANCE MONITORING PARAMETERS								
Microbiological								
Total Coliform Bacteria	MPN/100 mL	Range	ND - 16,000	9 - 3,700	7 - 300	49 - 9,800	ND - 3,900	Naturally present in the environment
		Median	37	140	75	780	76	
Escherichia coli (E. coli)	MPN/100 mL	Range	ND - 15	ND - 1	ND - 17	ND - 7	ND - 38	Human and animal fecal waste
		Median	ND	ND	1	3	ND	
Chemical								
Alkalinity (as $CaCO_3$)	ppm	Range	84 - 131	71 - 87	70 - 84	83 - 132	96 - 130	Runoff/leaching of natural deposits; carbonate, bicarbonate, hydroxide, and occasionally borate, silicate, and phosphate
		Highest RAA	120	78	81	112	121	
Fluoride	ppm	Range	0.1 - 0.4	0.1 - 0.2	0.1	0.1 - 0.3	0.2 - 0.4	Erosion of natural deposits; discharge from fertilizer and aluminum factories
		Average	0.3	0.2		0.2	0.3	
Total Organic Carbon (TOC)	ppm	Range	2.7 - 3.4	2.5 - 2.9	2.9 - 3.6	2.8 - 3.4	2.8 - 3.4	Various natural and man-made sources
		Highest RAA	3.1	2.9	3.3	3.1	3.1	
OTHER PARAMETERS								
Aluminum	ppb	Range	66	ND	ND	ND	82	Residue from water treatment process; natural deposits erosion
		Average						
Antimony	ppb	Range	ND	ND	ND	ND	ND	Petroleum refinery discharges; fire retardants; solder; electronics
		Average						
Arsenic	ppb	Range	2.1	ND	ND	2.1	2.0	Natural deposits erosion, glass and electronics production wastes
		Average						
Barium	ppb	Range	109	ND	ND	ND	108	Oil and metal refineries discharges; natural deposits erosion
		Average						
Beryllium	ppb	Range	ND	ND	ND	ND	ND	Discharge from metal refineries, aerospace, and defense industries
		Average						
Boron	ppb	Range	120	170	150	130	120	Runoff/leaching from natural deposits; Industrial wastes
		Average						
Cadmium	ppb	Range	ND	ND	ND	ND	ND	Internal corrosion of galvanized pipes; discharge from electroplating, industrial factories, and metal refineries; runoff from waste batteries and paints; natural deposits erosion
		Average						
Chromium	ppb	Range	ND	ND	ND	ND	ND	Discharge from steel and pulp mills; natural deposits erosion
		Average						
Chromium VI	ppb	Range	ND	ND	ND	ND	ND	Runoff/leaching from natural deposits; Industrial wastes
		Average						
Copper	ppm	Range	ND	ND	ND	ND	ND	Internal corrosion of household pipes; natural deposits erosion; leaching from wood preservatives
		Average						
Cryptosporidium	oocysts/10 L	Range	ND	ND	ND	ND	ND	Human and animal fecal waste
		Average						
Giardia	cysts/10 L	Range	ND	ND	ND	ND	ND	Human and animal fecal waste
		Average						
Hardness (as $CaCO_3$)	ppm	Range	100 - 284	106 - 124	72 - 108	118 - 290	106 - 292	Runoff/leaching from natural deposits; sum of polyvalent cations, generally magnesium and calcium present in the water
		Average	258	111	93	214	261	
Iron	ppb	Range	ND	ND	ND	ND	ND	Leaching from natural deposits; industrial wastes
		Average						
Lead	ppb	Range	ND	ND	ND	ND	ND	Internal corrosion of household water plumbing systems; industrial manufacturers' discharge; erosion of natural deposits
		Average						

2020 Water Quality Report to Member Agencies—The Metropolitan Water District of Southern California
Treatment Plant Influents

Parameter	Units	Range / Average	Treatment Plant Influent *					Major Sources in Drinking Water
			Diemer Plant	Jensen Plant	Mills Plant	Skinner Plant	Weymouth Plant	
Manganese	ppb	Range	ND	ND	ND	ND	ND	Leaching from natural deposits
		Average						
Mercury	ppb	Range	ND	ND	ND	ND	ND	Erosion of natural deposits; factory discharge; landfill runoff
		Average						
Nickel	ppb	Range	ND	ND	ND	ND	ND	Erosion of natural deposits; discharge from metal factories
		Average						
Perchlorate	ppb	Range	ND	ND	ND	ND	ND	Industrial waste discharge
		Average						
pH	pH Units	Range	7.9 - 8.6	7.3 - 8.0	7.5 - 8.5	7.7 - 8.8	7.9 - 8.5	Not applicable
		Average	8.2	7.7	8.0	8.2	8.2	
Selenium	ppb	Range	ND	ND	ND	ND	ND	Refineries, mines, and chemical waste discharge; runoff from livestock lots
		Average						
Specific Conductance	µS/cm	Range	119 - 961	401 - 470	331 - 517	734 - 962	663 - 947	Substances that form ions in water; seawater influence
		Average	891	430	435	761	911	
Silver	ppb	Range	ND	ND	ND	ND	ND	Industrial discharges
		Average						
Thallium	ppb	Range	ND	ND	ND	ND	ND	Leaching from ore processing; discharge from electronics, glass, and pharmaceutical factories
		Average						
Turbidity	NTU	Range	0.6 - 4.0	0.4 - 2.3	0.3 - 3.0	0.5 - 2.3	0.3 - 3.8	Soil runoff
		Average	1.3	0.7	0.6	0.9	1.0	
Vanadium	ppb	Range	ND	ND	ND	ND	ND	Naturally-occurring; industrial waste discharge
		Average						
Zinc	ppm	Range	ND	ND	ND	ND	ND	Runoff/leaching from natural deposits; industrial wastes
		Average						

DEFINITION OF TERMS AND FOOTNOTES

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Definition of Terms

Average	Arithmetic mean	ppb	Parts per billion or micrograms per liter (µg/L)
$CaCO_3$	Calcium Carbonate	ppm	Parts per million or milligrams per liter (mg/L)
DLR	Detection Limits for Purposes of Reporting	RAA	Running Annual Average; highest RAA is the highest of all
MCL	Maximum Contaminant Level		Running Annual Averages calculated as an average
MPN	Most Probable Number		of the all samples collected within a 12-month period
ND	Not Detected at or above DLR or RL	Range	Results based on minimum and maximum values; range and average
NTU	Nephelometric Turbidity Units		values are the same if a single value is reported for samples collected
PHG	Public Health Goal		once or twice annually
µS/cm	MicroSiemen per centimeter		