

Appendix 5.11 - Summary of Barrett Reservoir Source Water Constituents 2016 - 2020

CSD

			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
General Physical											
Alkalinity, (Total) (as CaCO3 equivalents)	MG/L	20						20	104	351	192
Calcium Hardness (CaCO3)	MG/L	10						20	67.7	145	110
Color, Apparent (Unfiltered)	COLOR	1			15	20	20	19	23	84	40.9
Corrosivity ³	-							15	0.28	1.38	0.92
Hydroxide Alkalinity	MG/L							12	ND	ND	ND
pH	PH					6.5-8.5 ⁶		13	7.46	9.05	8.27
Specific Conductance (E.C.)	UMHO/CM				1600			20	449	1320	754
Total Filterable Residue @ 180 C (TDS)	MG/L	10			1000	300	500	20	295	815	477
Total Hardness (CaCO3)	MG/L	10						25	148	382	246
Turbidity, Laboratory	NTU	0.07	0.1		5	20	20	20	1.14	23.1	5.44
Microbiological											
Enterococcus	/100 ML	1				60 ⁷		21	< 1	18	2.81
Escherichia Coli	/100 ML	1		Present		190 ⁷		21	< 10	20	< 10
Total Coliform	/100 ML	1		Present				21	31	> 24000	8760

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Group/Constituents	Units	CSD MDL	DLR	Primary	Secondary	Criteria	Objectives	No. of Samples	Min	Max	Mean
				MCL	SMCL						
Metals ⁴											
Aluminum (Al)	UG/L	5	50	1000	200			19	ND	147	39.5
Antimony	UG/L	1	6	6				19	ND	ND	ND
Arsenic	UG/L	1	2	10				20	ND	5.29	1.51
Barium (Ba)	UG/L	2	100	1000				20	ND	90.1	35.4
Beryllium	UG/L	0.5	1	4				20	ND	ND	ND
Boron	UG/L	5	100			500	1000	19	40.8	205	97.1
Cadmium (Cd)	UG/L	0.5	1	5				20	ND	ND	ND
Calcium (Ca)	MG/L	5						20	27.1	58	43.6
Chromium (Total Cr)	UG/L	1	10	50				20	ND	1.08	ND
Copper (Cu) ⁵	UG/L	1	50	1300	1000			20	ND	6.52	ND
Iron (Fe)	UG/L	100	100		300	300	300	20	ND	260	ND
Lead (Pb) ⁵	UG/L	0.5	5	15				20	ND	ND	ND
Magnesium (Mg)	MG/L	3						20	14.5	58.5	30.6
Manganese (Mn)	UG/L	0.5	20		50	50	50	20	17.7	371	96.1
Mercury (Hg)	UG/L	0.2	1	2				3	ND	ND	ND
Nickel	UG/L	1	10	100				20	ND	4.13	ND
Potassium (K)	MG/L	0.5						16	4.55	10.6	6.81
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	39.9	147	76.1
Thallium	UG/L	0.5	1	2				20	ND	ND	ND
Vanadium	UG/L	1	3					20	ND	15.5	5.5
Zinc (Zn)	UG/L	5	50		5000			18	ND	ND	ND

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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		5	ND	0.563	0.129
Bicarbonate (as HCO3)	MG/L							20	93	407	212
Bromide	MG/L	0.1						20	ND	0.736	0.246
Carbonate (as CO3)	MG/L							20	ND	19.2	5.73
Chloride	MG/L	0.5			500	250	250	20	47.1	167	89.1
Fluoride	MG/L	0.02	0.1	2		1	1	20	0.206	0.504	0.329
Nitrate (as NO3)	MG/L		2	45		5		19	ND	3.23	0.178
Nitrite (NO2)	MG/L	0.0156	0.131	0.328				5	ND	0.035	ND
Perchlorate	UG/L	4	4	6				40	ND	ND	ND
Phosphate, Ortho (as PO4)	MG/L	0.2						17	ND	0.761	ND
Phosphorus	MG/L	0.078				0.025 ⁸	0.025 ⁸	17	ND	0.226	0.11
Silica	MG/L	0.625						19	16.6	28.2	22.9
Sulfate (SO4)	MG/L	0.5	0.5		500	65	250	20	43.1	145	69.6
Total Nitrogen	MG/L	0.156					0.25 ⁸	19	0.685	3.46	1.33

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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		19	ND	ND	ND
2,4-D	UG/L	3	10	70		100		19	ND	ND	ND
Alachlor (ALANEX)	UG/L	0.5	1	2				6	ND	ND	ND
Atrazine (AATREX)	UG/L	0.4	0.5	1		3		6	ND	ND	ND
Bentazon (BASAGRAN)	UG/L	2	2	18		18		19	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				5	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				6	ND	ND	ND
Di(2-ethylhexyl)phthalate (DEHP)	UG/L	3	3	4		4		6	ND	ND	ND
Dibromochloropropane (DBCP)	UG/L	0.01	0.01	0.2		0.2		20	ND	ND	ND
Dinoseb (DNBP)	UG/L	2	2	7				19	ND	ND	ND
Endrin	UG/L	0.1	0.1	2		0.2		6	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				6	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		5	ND	ND	ND
meta,para xylenes	UG/L	0.4	0.5			1750		20	ND	ND	ND

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			DLR	Primary MCL	Secondary SMCL	Criteria	Objectives	No. of Samples	Min	Max	Mean
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		19	ND	ND	ND
Picloram	UG/L	1	1	500				19	ND	ND	ND
Polychlorinated Biphenyls, Total, as DCB	UG/L	0.5		0.5				6	ND	ND	ND
Simazine (PRINCEP)	UG/L	0.5	1	4		10		6	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		5	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

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				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					12	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						19	ND	ND	ND
2,4-DB	UG/L	3						19	ND	ND	ND
2-Chlorotoluene	UG/L	0.4	0.5					20	ND	ND	ND
3,5-Dichlorobenzoic Acid	UG/L	3						19	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		19	ND	ND	ND
Acenaphthylene	UG/L	0.5						4	ND	ND	ND
Acifluorfen	UG/L	3						19	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						6	ND	ND	ND
Baygon	UG/L	0.4						20	ND	ND	ND
Benzo (a) Anthracene	UG/L	0.5						6	ND	ND	ND
Benzo (b) Fluoranthene	UG/L	0.5						6	ND	ND	ND
Benzo (ghi) Perylene	UG/L	0.5						5	ND	ND	ND
Benzo (k) Fluoranthene	UG/L	0.5						6	ND	ND	ND
Benzyl Butyl Phthalate	UG/L	0.5						6	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						19	ND	ND	ND
Chloroethane	UG/L	0.4	0.5					20	ND	ND	ND

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Chloromethane (Methyl Chloride)	UG/L	0.4	0.5					20	ND	ND	ND
Chrysene	UG/L	0.5						6	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						5	ND	ND	ND
Dibromomethane	UG/L	0.4	0.5					20	ND	ND	ND
Dicamba (BANVEL)	UG/L	1.5	1.5					19	ND	ND	ND
Dichlorodifluoromethane (Freon 12)	UG/L	0.4	0.5					20	ND	ND	ND
Dichlorprop	UG/L	3						19	ND	ND	ND
Diethylphthalate	UG/L	0.5						6	ND	ND	ND
Diisopropyl Ether (DIPE)	UG/L	0.4	3					20	ND	ND	ND
Dimethyl phthalate	UG/L	0.5						5	ND	ND	ND
di-n-Butylphthalate	UG/L	2						6	ND	ND	ND
Ethyl-tert-Butyl Ether (ETBE)	UG/L	0.4	3					20	ND	ND	ND
Fluorene	UG/L	0.5						6	ND	ND	ND
Hexachlorobutadiene	UG/L	0.4	0.5					20	ND	ND	ND
Indeno (1,2,3-cd) Pyrene	UG/L	0.5						5	ND	ND	ND
Isopropylbenzene (Cumene)	UG/L	0.4	0.5					20	ND	ND	ND
MCPA	UG/L	3						19	ND	ND	ND
MCPP	UG/L	3						19	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					25	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				6	ND	ND	ND
PCB-1221 (as DCB)	UG/L	0.19	0.5	0.5				6	ND	ND	ND
PCB-1232 (as DCB)	UG/L	0.23	0.5	0.5				6	ND	ND	ND
PCB-1242 (as DCB)	UG/L	0.26	0.5	0.5				6	ND	ND	ND
PCB-1248 (as DCB)	UG/L	0.3	0.5	0.5				6	ND	ND	ND
PCB-1254 (as DCB)	UG/L	0.33	0.5	0.5				6	ND	ND	ND
PCB-1260 (as DCB)	UG/L	0.36	0.5	0.5				6	ND	ND	ND
Phenanthrene	UG/L	0.5				1		6	ND	ND	ND
p-Isopropyltoluene	UG/L	0.4						20	ND	ND	ND
Propachlor	UG/L	0.5	0.5					6	ND	ND	ND
Pyrene	UG/L	0.5						6	ND	ND	ND

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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						6	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)