

Monthly Avg Limit Computation and Comparison

MALs are calculated from the criterion LTAs reflected in the LTA worksheet. The most stringent MAL (of all applicable criteria) determines the criterion upon which a water quality-based permit limit for a substance is based. Agricultural mineral calculations are found in the Ag tab.

OWQScreen-S Version 3.35

MAL Computation and Comparison
GLENPOOL PIPELINE
BREAKOUTSTATION

Outfall		Comparison of Monthly Avg Limits (MALs)							
Parameters	Units	No. of Samples per Month (N)	Eqn 25 Aesthetics	PPWS		F&WP	Fish Consump	Controlling MAL	
				Eqn 26 Raw Water	Eqn 27 Human Hlth FF & Water	Eqn 28 Aquatic Toxicity	Eqn 29 Human Hlth Fish Flesh		
PART A									
Ammonia	mg/l								
PART B									
Color									
Fluoride (at 90 deg F)	mg/l								
Nitrate-Nitrite (as N)	mg/l								
Phosphorus (as P) (Scenic Rivers only)	mg/l								
Barium, total	mg/l								
Manganese, total									
METALS and CYANIDE									
Antimony, total									
Arsenic, total	ug/l								
Beryllium, total									
Cadmium, total	ug/l								
Chromium, total	ug/l								
Copper, total	ug/l								
Lead, total	ug/l	3		130.30	10.00	172.78	50.00	FFW	
Mercury, total	ug/l								
Nickel, total	ug/l								
Selenium, total	ug/l								
Silver, total	ug/l								
Thallium, total	ug/l								
Zinc, total	ug/l								
Cyanide, total	ug/l								
DIOXINS									
2,3,7,8-Tetrachlorodibenzo-P Dioxin	ug/l								
GC/MS FRACTION - VOLATILE COMPOUNDS									
Acrolein	ug/l								
Acrylonitrile	ug/l								
Benzene	ug/l								
Bromoform									
Carbon Tetrachloride	ug/l								
Chlorobenzene									
Chlorodibromomethane									
Chloroethane									
2-Chloroethylvinyl Ether									
Chloroform	ug/l								
Dichlorobromomethane	ug/l								
1,1-Dichloroethane									
1,2-Dichloroethane									
1,1-Dichloroethylene									
1,2-Dichloropropane									
1,3-Dichloropropylene									
Ethylbenzene	ug/l								
Methyl Bromide									
Methyl Chloride									
Methylene Chloride									
1,1,2,2-Tetrachloroethane									
Tetrachloroethylene	ug/l								
Toluene	ug/l								
1,2-Trans-dichloroethene									
1,1,1-Trichloroethane	ug/l								
1,1,2-Trichloroethane									
Trichloroethylene									
Vinyl Chloride									
GC/MS FRACTION - ACID COMPOUNDS									
2-Chlorophenol									
2,4-Dichlorophenol									
2,4-Dimethylphenol									
4,6-Dinitro-o-cresol									
2,4-Dinitrophenol									
2-Nitrophenol									

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4-Nitrophenol									
p-Chloro-m-cresol									
Pentachlorophenol	ug/l								
Phenol	ug/l								
2,4,6-Trichlorophenol									
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS									
Acenaphthene									
Acenaphthylene									
Anthracene									
Benzidine	ug/l								
Benzo (a) Anthracene									
Benzo (a) Pyrene									
3,4-Benzofluoranthene									
Benzo (ghi) Perylene									
Benzo (k) Fluoranthene									
Bis (2-Chloroethoxy) Methane									
Bis (2-Chloroethyl) Ether									
Bis (2-Chloroisopropyl) Ether									
Bis (2-Ethylhexyl) Phthalate	ug/l								
4-Bromophenyl Phenyl Ether									
Butylbenzyl Phthalate	ug/l								
2-Chloronaphthalene									
4-Chlorophenyl Phenyl Ether									
Chrysene									
Dibenzo (a,h) Anthracene									
1,2-Dichlorobenzene									
1,3-Dichlorobenzene									
1,4-Dichlorobenzene									
3,3'-Dichlorobenzidine									
Diethyl Phthalate	ug/l								
Dimethyl Phthalate	ug/l								
Di-n-butyl Phthalate	ug/l								
2,4-Dinitrotoluene									
2,6-Dinitrotoluene									
Di-n-octyl Phthalate									
1,2-Diphenylhydrazine (as Azobenzene)									
Fluoranthene									
Fluorene									
Hexachlorobenzene	ug/l								
Hexachlorobutadiene									
Hexachlorocyclopentadiene									
Hexachloroethane									
Indeno (1,2,3-cd) Pyrene									
Isophorone									
Naphthalene									
Nitrobenzene									
n-Nitrosodimethylamine									
n-Nitrosodi-n-propylamine									
n-Nitrosodiphenylamine									
Phenanthrene									
Pyrene									
1,2,4-Trichlorobenzene									
GC/MS FRACTION - PESTICIDES									
Aldrin	ug/l								
alpha-BHC									
beta-BHC									
gamma-BHC	ug/l								
delta-BHC									
Chlordane	ug/l								
4,4'-DDT	ug/l								
4,4'-DDE									
4,4'-DDD	ug/l								
Dieldrin	ug/l								
Endosulfan, total (α + β)	ug/l								
Endosulfan Sulfate									
Endrin	ug/l								
Endrin Aldehyde									
Heptachlor	ug/l								
Heptachlor Epoxide									

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PCB-1242									
PCB-1254									
PCB-1221									
PCB-1232									
PCB-1248									
PCB-1260									
PCB-1016									
Toxaphene	ug/l								
ADDITIONAL PARAMETERS									
Chlorides						See AG Worksheet			
Sulfates						See AG Worksheet			
Total Dissolved Solids (TDS)						See AG Worksheet			
2,4,5-TP	ug/l								
2,4,6-Trinitotoluene	ug/l								
2,4-D	ug/l								
Bis-chloromethyl ether									
Chlorpyrifos (Dursban)	ug/l								
Demeton	ug/l								
Detergents, total	mg/l								
Diazinon	ug/l								
Dinitrophenols									
Guthion	ug/l								
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	ug/l								
Malathion	ug/l								
Methoxychlor	ug/l								
Methylene Blue Active Substances	ug/l								
Mirex	ug/l								
n-Nitrosodibutylamine									
n-Nitrosodiethylamine									
n-Nitrosopyrrolidine									
Nonylphenol (mixed isomers)	ug/l								
Parathion	ug/l								
PCB's, total	ug/l								
Pentachlorobenzene									
Perchlorate	ug/l								
Phthalate Esters (except Butylbenzyl)	ug/l								
1,2,4,5-Tetrachlorobenzene									
2,4,5-Trichlorophenol									

Equations Used to Calculate Monthly Avg Limits (MALs)		
Criterion	Eqn No.	MAL Equation
Aesthetics	Eqn 25	$MAL_{AES} = LTA_{AES}$
Raw Water	Eqn 26	$MAL_{RAW} = LTA_{RAW}$
HH / Fish Flesh and Water	Eqn 27	$MAL_{FFW} = LTA_{FFW}$
Aq Toxicity	Eqn 28	$MAL_{TOX} = \min(LTA_{ACUTE}, LTA_{CHRONIC}) \times \exp(1.645 (\ln(1 + CV^2 / N))^{1/2} - 0.5 \ln(1 + CV^2 / N))$
HH / Fish Flesh	Eqn 29	$MAL_{FF} = LTA_{FF}$