

MESA CONSOLIDATED WATER DISTRICT  
REPORT ON MESA'S WATER QUALITY RELATIVE TO PUBLIC HEALTH GOALS 2007

Background:

Provisions of the California Health and Safety Code specify that larger (>10,000 service connections) water utilities prepare a special report by July 1, 2007 if their water quality measurements have exceeded any Public Health Goals (PHGs). PHGs are non-enforceable goals established by the Cal-EPA's Office of Environmental Health Hazard Assessment (OEHHA). The law also requires that where OEHHA has not adopted a PHG for a constituent, the water suppliers must use the Maximum Contaminant Level Goal (MCLG) adopted by United States Environmental Protection Agency (USEPA). Only constituents which have a California primary drinking water standard and for which either a PHG or MCLG has been set are to be addressed. (Reference No. 1 is a list of all regulated constituents with the MCLs and PHGs or MCLGs.) The law specifies what information is to be provided in the report.

There are a few constituents that are routinely detected in water systems at levels usually well below the drinking water standards for which no PHG or MCLG has yet been adopted by OEHHA or USEPA including Total Trihalomethanes. These will be addressed in a future required report after a PHG has been adopted.

If a constituent was detected in Mesa Consolidated Water District's (Mesa) water supply between 2004 and 2006 at a level exceeding an applicable PHG or MCLG, this report provides the information required by the law. Included is the numerical public health risk associated with the MCL and the PHG or MCLG, the category or type of risk to health that could be associated with each constituent, the best treatment technology available that could be used to reduce the constituent level, and an estimate of the cost to install that treatment if it is appropriate and feasible.

What Are PHGs?

PHGs are set by the California Office of Environmental Health Hazard Assessment which is part of Cal-EPA and are based solely on public health risk considerations. None of the practical risk-management factors that are considered by the USEPA or the California Department of Health Services (CDHS) in setting drinking water standards (MCLs) are considered in setting the PHGs. These factors include analytical detection capability, treatment technology available, benefits and costs. The PHGs are not enforceable and are not required to be met by any public water system. MCLGs are the federal equivalent to PHGs.

Water Quality Data Considered:

All of the water quality data collected by Mesa between 2004 and 2006 for purposes of determining compliance with drinking water standards was considered. This data was all summarized in our 2004, 2005, and 2006 Annual Water Quality Reports, which were mailed to all of Mesa's customers in July of those years.

Guidelines Followed:

The Association of California Water Agencies (ACWA) formed a workgroup which prepared guidelines for water utilities to use in preparing these newly required reports. The ACWA guidelines were used in the preparation of Mesa's report. No guidance was available from state regulatory agencies.

### Best Available Treatment Technology and Cost Estimates:

Both the USEPA and CDHS adopt what are known as Best Available Technologies or BATs which are the best known methods of reducing contaminant levels to the MCL. Costs can be estimated for such technologies. However, since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible or feasible to determine what treatment is needed to further reduce a constituent downward to or near the PHG or MCLG, many of which are set at zero. Estimating the costs to reduce a constituent to zero is difficult, if not impossible because it is not possible to verify by analytical means that the level has been lowered to zero. In some cases, installing treatment to try and further reduce very low levels of one constituent may have adverse effects on other aspects of water quality.

### Constituents Detected That Exceed a PHG or a MCLG:

The following is a discussion of constituents that were detected in one or more of our drinking water sources at levels above the PHG, or if no PHG, above the MCLG.

#### Copper:

There is no MCL for copper. Instead the 90th percentile value of all samples from household taps in the distribution system cannot exceed an Action Level of 1.3 mg/l for copper. The PHG for copper is 0.17 mg/l. All of Mesa's source water samples for copper in 2004-2006 were less than the PHG. Based on extensive sampling of homes served from Mesa's distribution system in 2005, our 90th percentile value for copper was 0.3 mg/l.

The category of health risk for copper is gastrointestinal irritation. Numerical health risk data on copper has not yet been provided by OEHHA, the State agency responsible for providing that information. Our water system is in full compliance with the Federal and State Lead and Copper Rule. Based on our extensive sampling, it was determined according to State regulatory requirements that we meet the Action Levels for Lead and Copper. Therefore, we are deemed by CDHS to have "optimized corrosion control" for our system.

In general, optimizing corrosion control is considered to be the best available technology to deal with corrosion issues and with any lead or copper findings. Mesa continues to monitor water quality parameters that relate to corrosivity, such as the pH, hardness, alkalinity, total dissolved solids, and will take action if necessary to maintain the system in an "optimized corrosion control" condition.

#### Bromate:

There is no PHG for bromate but the MCLG set by the USEPA is zero. The MCL for bromate is 10 ug/L based on a running annual average (RAA). Bromate is produced when water with high bromide levels is treated with ozone. The highest RAA reported from 2004-2006 was 9.5 ug/L, below the regulatory standard. The range of detections was from <5 ug/L to 57 ug/L.

The health risk associated with bromate is carcinogenicity, where people who drink water containing bromate above the MCL throughout their lifetime could experience an increased risk of getting cancer. Because there is no PHG for bromate, OEHHA has not yet determined the numerical health risk at the MCL. However, an MCLG of zero has a numerical health risk of zero.

The BAT for bromate is control of the ozone treatment process to reduce production of bromate. The BAT is not feasible for ozone color removal systems. Mesa installed a catalytic carbon system to reduce the bromate level below the MCL.

### Arsenic:

The PHG for arsenic is 0.004 ug/L and the MCL is 10 ug/L. Low levels of arsenic have been found in Mesa's groundwater sources up to 2.5 ug/L from 2004-2006. The average was below detectable levels. Arsenic is naturally occurring element found throughout the earth's crust. The levels were below the MCL at all times. No action is required.

The health risks associated with arsenic are that some people who drink water containing arsenic in excess of the MCL over many years may experience skin damage or circulatory problems, and may have an increased risk of getting cancer. The numerical health risk for carcinogenicity at the 10 ug/L MCL is  $1-2 \times 10^{-4}$  (1-2 in 10,000) and  $1 \times 10^{-6}$  (1 in 1 million) at the PHG.

The BATs for arsenic removal at the 95% level are reverse osmosis, ion exchange, activated alumina, and modified coagulation and filtration. The least expensive BAT for Arsenic in groundwater is an ion exchange method that would increase treatment costs by approximately \$160-210 per AF of treated water.

### Uranium:

The PHG for uranium is 0.43 pCi/L and the California MCL is 20 pCi/L. Mesa detected low levels of uranium in its groundwater wells as high as 3.5 pCi/L, averaging <2 pCi/L from 2004-2006. Mesa also purchases some treated surface water from Metropolitan Water District (MWD). This source had detections as high as 2.6 pCi/L from 2004-2006. The average over the same period was below reportable detection levels. The levels were below the MCL at all times. No action is required.

The health risk associated with uranium is that some people who drink water which contains uranium in excess of the MCL over many years may have kidney problems or an increased risk of getting cancer. The numerical health risk for this PHG is  $1 \times 10^{-6}$  (1 in 1 million). The numerical health risk for this MCL is  $5 \times 10^{-5}$  (5 in 100,000).

The BATs for uranium removal are ion exchange, reverse osmosis, lime softening or enhanced coagulation/filtration. The least expensive BAT for uranium in groundwater is an ion exchange method that would increase treatment costs by approximately \$160-210 per AF of treated water.

### Radium:

The PHG for radium-226 is 0.05 pCi/L and 0.019 pCi/L for radium-228. The MCL for combined radium is 5 pCi/L. Radium occurs in water through the erosion of natural deposits. Mesa has detected combined radium as high as 1.8 pCi/L in groundwater sources from 2004-2006. The average was below reportable detection levels. All results were below the MCL, therefore no action is required.

The health risk category for radium is carcinogenicity (cancer). The numerical health risks for the PHG's are both  $1 \times 10^{-6}$  (1 in 1 million). The numerical health risk for the radium-226 MCL is  $1 \times 10^{-4}$  (1 in 10,000) and is  $3 \times 10^{-4}$  (3 in 10,000).

The BATs for radium removal are lime softening, reverse osmosis and ion exchange. The least expensive BAT for radium in groundwater is an ion exchange method that would increase treatment costs by approximately \$160-210 per AF of treated water.

#### Gross Alpha Particle Activity:

There is no PHG for gross alpha particle activity but the MCLG set by the USEPA is zero. The California and USEPA MCL is 15 pCi/L. The erosion of natural deposits of certain minerals that are radioactive may emit a form of radiation known as alpha radiation. Mesa did not detect reportable levels of gross alpha particle activity from 2004-2006. Purchased water from MWD had detected levels as high as 7.2 pCi/L during the same period, with the highest annual average equaling 3.6 pCi/L. All results were below the MCL, therefore no action is required.

The health risk category for gross alpha particle activity is carcinogenicity (cancer). The numerical health risk for the MCLG is zero. The numerical health risk for the MCL is up to  $1 \times 10^{-3}$  (1 in 1,000) for the most potent alpha emitter, polonium-210.

The BAT for gross alpha particle activity is a reverse osmosis system that would increase treatment costs by an estimated range of \$480-\$1700 per AF of treated water.

#### Gross Beta Particle Activity:

There is no PHG for gross beta particle activity but the MCLG set by the USEPA is zero. The California MCL is 50 pCi/L. The decay of natural and man-made deposits of certain minerals that are radioactive may emit forms of radiation known as photons and beta radiation. Purchased water from MWD had detected levels as high as 6.4 pCi/L during the same period 2004-2006, with the highest annual average equaling 4.8 pCi/L. All results were below the MCL, therefore no action is required.

The health risk category for gross beta particle activity is carcinogenicity (cancer). The numerical health risk for the MCLG is zero. The numerical health risk for the MCL is up to  $2 \times 10^{-3}$  (2 in 1,000) for the most potent beta emitter, lead-210.

The BATs for gross beta particle activity are reverse osmosis and ion exchange. The least expensive BAT for gross beta particle activity is an ion exchange method that would increase treatment costs by approximately \$160-210 per AF of treated water.

#### Recommendations for further actions:

The drinking water quality of the Mesa Consolidated Water District meets all State of California, Department of Health Services and USEPA drinking water standards set to protect public health. To further reduce the levels of the constituents identified in this report that are already significantly below the health-based Maximum Contaminant Levels established to provide "safe drinking water" would require additional costly treatment processes. The effectiveness of the treatment processes to provide any significant reductions in constituent levels at these already low values is uncertain. The health protection benefits of these further hypothetical reductions are not at all clear and may not be quantifiable. Therefore, no action is proposed.

#### REFERENCES:

- No.1 Table of Regulated Constituents with MCLs, PHGs or MCLGs

ATTACHMENT NO. 1  
CALIFORNIA MCLs AND PHGs AND FEDERAL MCLGs  
2007

PARAMETERS/ CONSTITUENTS	Units	STATE MCL	DLR	PHG or (MCLG)
<b>INORGANICS</b>				
ALUMINUM	mg/L	1	0.05	0.6
ANTIMONY	mg/L	0.006	0.006	0.020
ARSENIC	mg/L	0.05 <sup>a</sup>	0.002	0.000004**
ASBESTOS	fibers/L	7 million	0.2 million	(7 million)
BARIUM	mg/L	1	0.1	2
BERYLLIUM	mg/L	0.004	0.001	0.0001
CADMIUM	mg/L	0.005	0.001	0.00004**
CHROMIUM	mg/L	0.05	0.01	withdrawn***
CHROMIUM 6	mg/L			
COPPER (at-the-tap; 90th percentile)	mg/L	AL=1.3	0.05	0.17
CYANIDE	mg/L	0.15	0.1	0.15
FLUORIDE	mg/L	1.4-2.4	0.1	1
LEAD (at-the-tap; 90th percentile)	mg/L	AL=0.015	0.005	0.002
MERCURY	mg/L	0.002	0.001	0.0012
NICKEL	mg/L	0.1	0.01	0.012
NITRATE [as N]	mg/L	10	0.4	10
NITRATE [as N03]	mg/L	45	2	45
NITRITE [as N]	mg/L	1	0.4	1
SELENIUM	mg/L	0.05	0.005	(0.05)
THALLIUM	mg/L	0.002	0.001	0.0001
<b>ORGANICS</b>				
ACRYLAMIDE	TT	TT		(0)
ALACHLOR	mg/L	0.002	0.001	0.004
ATRAZINE	mg/L	0.001	0.001	0.00015
BENTAZON	mg/L	0.018	0.002	0.2
BENZENE	mg/L	0.001	0.0005	0.00015
BENZO (a) PYRENE	mg/L	0.0002	0.0001	0.000004
BROMATE	mg/L	0.01	0.0050	(0)
CARBOFURAN	mg/L	0.018	0.005	0.0017
CARBON TETRACHLORIDE	mg/L	0.0005	0.0005	0.0001
CHLORDANE	mg/L	0.0001	0.0001	0.00003
CHLORITE	mg/L	1	0.02	(0.8)
CHLOROETHENE [VINYL CHLORIDE]	mg/L	0.0005	0.0005	0.00005
CIS-1,2-DICHLOROETHYLENE	mg/L	0.006	0.0005	0.1**
2,4-D	mg/L	0.07	0.01	0.07
DALAPON	mg/L	0.2	0.01	0.79
DIBROMOCHLOROPROPANE [DBCP]	mg/L	0.0002	0.00001	0.0000017
1,2-DICHLOROBENZENE [ORTHO]	mg/L	0.6	0.0005	0.6
1,4-DICHLOROBENZENE [PARA]	mg/L	0.005	0.0005	0.006
1,1-DICHLOROETHANE [1,1-DCA]	mg/L	0.005	0.0005	0.003
1,2-DICHLOROETHANE [1,2-DCA]	mg/L	0.0005	0.0005	0.0004
1,1-DICHLOROETHENE [1,1-DCE]	mg/L	0.006	0.0005	0.01
DICHLOROMETHANE	mg/L	0.005	0.0005	0.004
1,2-DICHLOROPROPANE	mg/L	0.005	0.0005	0.0005
1,3-DICHLOROPROPENE	mg/L	0.0005	0.0005	0.0002
DI (2-ETHYLHEXYL) ADIPATE	mg/L	0.4	0.005	0.2
DI (2-ETHYLHEXYL) PHTHALATE	mg/L	0.004	0.003	0.012
DINOSEB	mg/L	0.007	0.002	0.014
DIOXIN [2,3,7,8 - TCDD]	mg/L	3x10 <sup>-8</sup>	5x10 <sup>-9</sup>	(0)
DIQUAT	mg/L	0.02	0.004	0.015
ENDOTHALL	mg/L	0.1	0.045	0.58
ENDRIN	mg/L	0.002	0.0001	0.0018
EPICHLOROHYDRIN	TT			(0)
ETHYLBENZENE	mg/L	0.3	0.0005	0.3
ETHYLENE DIBROMIDE [EDB]	mg/L	0.00005	0.00002	0.00001
GLYPHOSATE	mg/L	0.7	0.025	1.0
HEPTACHLOR	mg/L	0.00001	0.00001	0.000008

ATTACHMENT NO. 1  
CALIFORNIA MCLs AND PHGs AND FEDERAL MCLGs  
2007

PARAMETERS/ CONSTITUENTS	Units	STATE MCL	DLR	PHG or (MCLG)
HEPTACHLOR EPOXIDE	mg/L	0.00001	0.00001	0.000006
HEXACHLOROBENZENE	mg/L	0.001	0.0005	0.00003
HEXACHLOROCYCLOPENTADIENE	mg/L	0.05	0.001	0.05
LINDANE	mg/L	0.0002	0.0002	0.000032
METHOXYCHLOR	mg/L	0.03	0.01	0.03
METHYL TERTIARY BUTYL ETHER (MTBE)	mg/l	0.013	0.003	0.013
MOLINATE	mg/L	0.02	0.002	none
MONOCHLOROBENZENE	mg/L	0.07	0.0005	0.2
OXAMYL	mg/L	0.05	0.02	0.05
PENTACHLOROPHENOL	mg/L	0.001	0.0002	0.0004
PICLORAM	mg/L	0.5	0.001	0.5
POLYCHLORINATED BIPHENYLS [PCBs]	mg/L	0.0005	0.0005	(0)
SILVEX [2,4,5-TP]	mg/L	0.05	0.001	0.025
SIMAZINE	mg/L	0.004	0.001	0.004
STYRENE	mg/L	0.1	0.0005	(0.1)
1,1,2,2-TETRACHLOROETHANE	mg/L	0.001	0.0005	0.0001
TETRACHLOROETHYLENE [PCE]	mg/L	0.005	0.0005	0.00006
THIOBENCARB	mg/L	0.07	0.001	0.07
TOLUENE	mg/L	0.15	0.0005	0.15
TOXAPHENE	mg/L	0.003	0.001	0.00003
TRANS-1,2-DICHLOROETHYLENE	mg/L	0.01	0.0005	0.06**
1,2,4-TRICHLOROBENZENE	mg/L	0.005	0.0005	0.005
1,1,1-TRICHLOROETHANE [1,1,1-TCA]	mg/L	0.2	0.0005	1.0**
1,1,2-TRICHLOROETHANE [1,1,2-TCA]	mg/L	0.005	0.0005	0.0003**
TRICHLOROETHYLENE [TCE]	mg/L	0.005	0.0005	0.0008
TRICHLOROFLUOROMETHANE (FREON 11)	mg/L	0.15	0.005	0.70
TRICHLOROTRIFLUOROETHANE (FREON 113)	mg/L	1.2	0.01	4.0
TRIHALOMETHANES, TOTAL [TTHMs]	mg/L	0.1	0.0005	none
XYLENES [SUM OF ISOMERS]	mg/L	1.750	0.0005	1.8
<b>MICROBIOLOGICAL</b>				
COLIFORM % POSITIVE SAMPLES	%	5		(zero)
CRYPTOSPORIDIUM*		TT		(zero)
GIARDIA LAMBLIA		TT		(zero)
LEGIONELLA		TT		(zero)
VIRUSES		TT		(zero)
<b>RADIOLOGICAL</b>				
ALPHA ACTIVITY, GROSS	pCi/L	15	3	(zero)
BETA ACTIVITY, GROSS	pCi/L	4 mrem/yr	4	(zero)
RADIUM 226	pCi/L	5	1	0.05**
RADIUM 228	pCi/L	5	1	0.019**
STRONTIUM 90	pCi/L	8	2	0.35**
TRITIUM	pCi/L	20000	1000	400**
URANIUM	pCi/L	20	2	0.43

MCL = Maximum Contaminant Level

MCLG = Maximum Contaminant Level Goal

\*Surface Water Systems Only

\*\*PHG revised, MCL to be reviewed and may also be revised.

PHG = Public Health Goal

DLR = Detection Limit for Reporting purposes; set by DHS

TT = Treatment Technique

\*\*\*Total Chromium PHG withdrawn-awaiting revised PHG for Chromium 6

a - USEPA adopted an arsenic level of 10 ppb that became effective in California on Jan. 23, 2006.