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2016 Annual Water Quality Report

In 2015, MMWD's water met or surpassed all federal and state drinking water standards.

A scenic landscape photograph showing rolling green hills under a clear blue sky, with a calm body of water in the foreground reflecting the hills and sky. The foreground is filled with tall, dry grasses.

2016 ANNUAL WATER QUALITY REPORT

Covering the reporting period of
January - December 2015



MARIN MUNICIPAL
WATER DISTRICT

MMWD 2016 Water Quality Report

Since its founding in 1912, the Marin Municipal Water District's (MMWD) top priority has been water quality. Each year it is our privilege to inform you about the high quality of the water you drink. We are proud to report that in 2015, as in prior years, your water continued to meet or surpass all federal and state drinking water standards. This report describes where your water comes from, what it contains, how it compares to the state and federal drinking water standards, and summarizes the results of the thousands of water quality analyses we conducted on your drinking water during 2015. Thank you for taking the time to read our 2016 Annual Water Quality Report. We look forward to another year of providing you with safe, reliable water.

Our Drinking Water Sources and Treatment

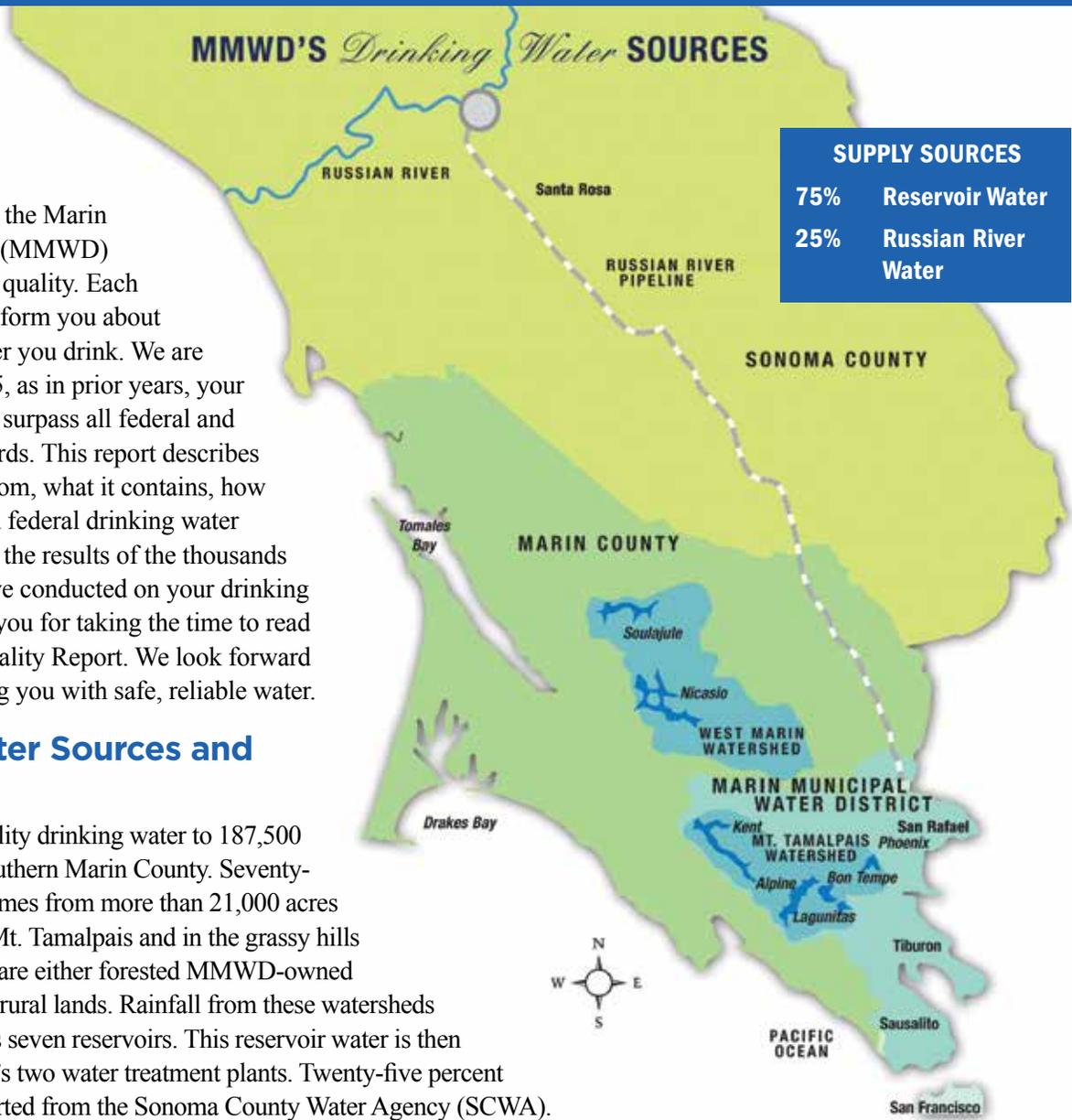
MMWD provides high-quality drinking water to 187,500 customers in central and southern Marin County. Seventy-five percent of our water comes from more than 21,000 acres of protected watershed on Mt. Tamalpais and in the grassy hills of west Marin. These areas are either forested MMWD-owned lands or other undeveloped rural lands. Rainfall from these watersheds flows into one of MMWD's seven reservoirs. This reservoir water is then treated at one of the district's two water treatment plants. Twenty-five percent of MMWD's water is imported from the Sonoma County Water Agency (SCWA). SCWA water originates from rainfall that flows into Lake Sonoma and Lake Mendocino and is released into the Russian River. The Russian River water is filtered naturally through 80 feet of sand beds adjacent to the river. The Russian River water is treated at our third treatment plant before being blended with MMWD's reservoir water within our distribution system.

MMWD takes many steps to ensure the water delivered to your tap is of high quality. These steps include carefully managing our watershed lands and reservoirs, treating the water, operating and monitoring a complex distribution system, and maintaining and upgrading our facilities. Every year MMWD conducts more than 120,000 water quality and process control tests from watershed to faucet to ensure your water is safe to drink. This includes ongoing process control testing at our treatment plants as well as laboratory testing. Many of these samples undergo chemical, bacteriological, and physical analysis in the district's water quality laboratory, which is certified by the California Department of Public Health Environmental Laboratory Accreditation Program. Other samples are sent to specialty labs for testing.

This information is provided in compliance with requirements established by the State Water Resources Control Board Division of Drinking Water and the U.S. Environmental Protection Agency and as a policy of the Marin Municipal Water District to inform customers of the contents of their drinking water and water quality standards.

This report and additional water quality information is available on our web site: marinwater.org.

Cover Photo: Photo by Mary Sheft, Black Mountain and the Nicasio Reservoir in West Marin



Frequently Asked Questions About Water Quality

Does MMWD test for lead in drinking water?

Yes. MMWD drinking water is virtually lead-free when it is delivered from our reservoirs and distribution system. Water is naturally corrosive, and in some cases, can corrode lead pipes and plumbing in older homes and buildings, potentially releasing lead into the water. In response, MMWD maintains an active corrosion control program to reduce the potential for pipes to corrode and release lead. MMWD regularly performs corrosion tests at the treatment plants and at select points throughout the distribution system. As required by federal regulations, MMWD conducts at-the-tap lead monitoring at select households throughout the district's service area. For this study, MMWD targets homes built in the early 1980s or earlier, when lead solder was still in use. For testing conducted in 2015, lead was not detected above the federal regulatory standard or action level of 15 micrograms per liter ($\mu\text{g/L}$) in 100% of the homes tested.

Is bottled water better than tap?

It is a matter of personal preference. There is no significant health difference between tap water and bottled water, which comes from many sources, including wells, springs, and even the tap. There is a significant cost difference, however. Drinking one liter of bottled water daily averages more than \$1,000 per year, while drinking one liter of MMWD tap water daily costs less than \$1 per year—and that includes 24/7 delivery to your home!

Do I have hard or soft water?

Our water is on the soft side. Water hardness, a measure of dissolved calcium and magnesium in water, is commonly expressed in grains per gallon (gpg). Water from MMWD's reservoirs ranges in hardness from 3-4 gpg, while water imported from the Russian River ranges from 5-7 gpg. We blend the Russian River water with reservoir water, so the average hardness of the water provided to customers in the northern and central portions of our service area is 4-6 gpg.

What can you tell me about fluoride and dental fluorosis?

MMWD has been fluoridating the drinking water for reduction of tooth decay for more than 40 years in response to ballot initiatives approved by district voters in 1972 and 1978. Fluoridation is also mandated by the State of California. In Marin, our naturally occurring fluoride level of about 0.1 milligrams of fluoride per liter (mg/L) of water is adjusted to an optimal fluoride level of 0.7 mg/L, which is equivalent to about one drop of fluoride in 18 gallons of water.

Fluoride intake from water and other fluoride sources, such as toothpaste and mouth rinse, during the ages when teeth are forming (from birth through age 8) can lead to changes in the appearance of the tooth's surface called dental fluorosis. In the United States, most dental fluorosis is mild and appears as white spots that are barely noticeable and hard for anyone but a dentist or hygienist to see. Because most infant formulas contain low levels of fluoride, regularly mixing powdered or liquid infant formula concentrate with fluoridated water may increase the chance of a child developing the faint white markings of mild fluorosis. While you can use fluoridated water to prepare infant formula, if your baby does not eat or drink anything but infant formula that is mixed with fluoridated water, there may be an increased chance for mild dental fluorosis. To lessen this chance, you can use low-fluoride bottled water some of the time to mix with infant formula; these bottled waters are labeled as de-ionized, purified, demineralized, or distilled. If they have added fluoride, the label will say so. For additional information about infant formula and fluoride, please visit the CDC website at: http://www.cdc.gov/fluoridation/safety/infant_formula.htm.



Water Quality Lab Manager Chris Nanney prepares water samples for testing.

Photo credit: Marin Independent Journal

Who can I contact if I have additional questions about water quality?

Please contact our Water Quality Lab at 415-945-1550 or waterquality@marinwater.org.

Thank you for continuing to conserve!

Detected Contaminants With Primary MCL, AL, or TT

Distribution System (Blend of Reservoir and SCWA Waters)

CONSTITUENT	UNITS	MCLG (PHG)	MCL	AVG	RANGE	SOURCE
Coliform Bacteria	% presence	0	5	0.6 [1]	0-0.6	Naturally present in the environment
Copper	mg/L	(0.3)	1.3 [2]	0.12 [3]	No site over action level	Internal corrosion of household plumbing systems
Lead	µg/L	(0.2)	15 [2]	ND [3]	No site over action level	Internal corrosion of household plumbing systems
Haloacetic Acids	µg/L	NA	60 [4]	37 [5]	ND - 68 [7]	By-product of drinking water disinfection
Total Trihalomethanes	µg/L	NA	80 [4]	63 [5]	16 - 76 [7]	By-product of drinking water disinfection
Chloramines	mg/L	4 [6]	4 [6]	1.52	ND - 2.8	Drinking water disinfectant added for treatment

[1] Highest percentage of positive samples collected in any one month.

[2] Action level for 90th percentile value.

[3] 50 sites were analyzed in 2015, and the sixth highest concentration out of 50 (90th percentile) is listed.

[4] Compliance is based on the locational four quarter running average of distribution system samples.

[5] Highest locational running annual average for 2015. This value is compared to the MCL.

[6] Maximum Residual Disinfectant Level (MRDL) is a term used for disinfectants such as chloramine; in contrast to Maximum Contaminant Level (MCL) used for other parameters. The Maximum Residual Disinfectant Level Goal (MRDLG) is the same as the MCL. Disinfectants provide protection from viruses and bacteria, such as E. coli.

[7] Range of individual sample results for all monitoring locations.

Source Water

CONSTITUENT	SOURCE	UNITS	MCLG (PHG)	MCL (AL)	AVG	RANGE	SOURCE
Radium 228	Reservoirs	pCi/L	(0.019)	NA	ND [1]	ND - 1.1	Erosion of natural deposits
Fluoride	SCWA	mg/L	(1)	2	ND	ND - 0.1	Erosion of natural deposits
	Reservoirs	mg/L	(1)	2	ND	ND - 0.1	Erosion of natural deposits

[1] 2007 data.

CONSTITUENT	UNITS	PHG	TT	Minimum % meeting turbidity limits	RANGE	SOURCE
Turbidity	NTU	NA	0.3 [1]	100%	0.03 - 0.13	Soil runoff
Reservoir Water	NTU	NA	1 [2]	100%	0.03 - 0.13	Soil runoff

[1] 95% of all readings shall be less than or equal to this value.

[2] No single reading shall exceed 1 NTU.

UNDERSTANDING THIS REPORT

To help you better understand this report, key definitions are shown below.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL): The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a disinfectant added for water-treatment below which there is no known or expected risk to health. MRDLGs are set by the U.S. Environmental Protection Agency.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements and water treatment requirements.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Regulatory Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Other Detected Constituents Including Those With Secondary MCLs

CONSTITUENT	UNITS	SMCL	Reservoir Water		SCWA Water		SOURCE
			AVG	RANGE	AVG	RANGE	
Odor	TON	3	ND	ND - 1	ND	ND - 2	Naturally occurring organic materials
Chloride	mg/L	500	36	28 - 46	10	9 - 11	Runoff/leaching of natural deposits
Specific Conductance	µS/cm	1,600	238	192 - 294	321	296 - 348	Substances that form ions in water
Sulfate	mg/L	500	6	4 - 8	15	12 - 18	Runoff/leaching of natural deposits
Total Dissolved Solids	mg/L	1,000	130	103 - 154	186	182 - 193	Runoff/leaching of natural deposits
Turbidity	NTU	5	0.14	0.07 - 0.30	0.14	0.07 - 0.59	Soil runoff
Manganese	mg/L	0.05	ND	ND	ND	ND - 0.05	Leaching from natural deposits
Zinc	mg/L	5.0	0.2	0.18 - 0.24	0.18	0.16 - 0.20	Corrosion inhibitor
Sodium	mg/L	NA	22	16 - 27	24	21 - 30	
Hardness [1]	mg/L	NA	64	56 - 70	121	104 - 134	
Hardness	grains/gal	NA	3.7	3.3 - 4.1	7.1	6.1 - 7.8	
Alkalinity [1]	mg/L	NA	55	48 - 74	137	124 - 150	
Radon [2]	pCi/L	NA	NA	NA	112	112	

[1] Expressed as Calcium Carbonate or CaCO₃.

[2] Radon is a naturally occurring radioactive gas of geologic origin. It can migrate into indoor air through cracks in foundations. Tap water contributions to indoor air are small by comparison. Breathing air containing radon can lead to lung cancer. Ingesting water that contains radon may increase the risk of incurring stomach cancer. For additional information, contact USEPA's radon hotline (800-767-7236). The level of 160 pCi/L found in SCWA water entering the MMWD system in 2014 is far below the proposed regulatory limits of 300 and 4,000 pCi/L.

UCMR Data*

CONSTITUENT	UNITS	NL [MCL]	Reservoir Water		SCWA Water		HEALTH EFFECTS
			AVERAGE	RANGE	AVERAGE	RANGE	
Chlorate [1]	µg/L	800	99	36-420	24	21-26	
Strontium [1]	µg/L	NA	76	46-140	205	200-210	
Vanadium [1]	µg/L	50	ND	ND	0.8	0.8	The babies of some pregnant women who drink water containing vanadium in excess of the notification level may have an increased risk of developmental effects, based on studies in laboratory animals.

[1] 2014 Data collected under the EPA's Unregulated Contaminant Monitoring Rule 3 (UCMR3).

*Unregulated contaminant monitoring helps EPA and the SWRCB - DDW to determine where certain contaminants occur and whether the contaminants need to be regulated.

Distribution System Fluoride

UNITS	TT	AVERAGE	RANGE	DATE
mg/L	0.8 - 1.4	0.9	0.8-1.0	Jan 2015 - Apr 2015
mg/L	0.6 - 1.2	0.8	0.6 - 0.9	May 2015 - Dec 2015

Fluoride occurs naturally in almost all surface and ground waters. Following a voter initiative passed in 1972, the fluoride level was maintained at 0.9 mg/L. Based upon an April 2015 Department of Health and Human Services recommendation, MMWD reduced the target fluoride concentration from 0.9 to 0.7 mg/L in May 2015.

What is 1mg/L? ONE MILLIGRAM PER LITER = ONE PART PER MILLION

▶▶▶ Here are some equivalent ratios to help you understand the figures in this report more easily.

ONE PART PER MILLION IS ... **1¢** one cent in \$10,000

⌚ one minute in two years

1" one inch in 16 miles

Abbreviations

MCL.....Maximum Contaminant Level	NTU.....Nephelometric Turbidity Units	UCMR.....Unregulated Contaminant Monitoring Rule
mg/L.....Milligrams per liter (equals parts per million)	pCi/L.....PicoCuries per liter	µg/L.....Micrograms per liter (equals parts per billion)
NANot Applicable	PHG.....Public Health Goal	µS/cm.....microSiemens per centimeter
ND.....Not Detected	SCWA.....Sonoma County Water Agency	SWRCB - DDW...State Water Resources Control Board - Division of Drinking Water
NL.....Notification Level	TON.....Threshold Odor Number	

Special Health Needs

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. Persons in these categories should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Attention, Landlords and Other Property Managers

We recommend that landlords and other property managers display this report in a public location such as a lobby, laundry room, or community room. If you would like to receive additional copies of this report, please call MMWD's Water Quality Laboratory at 415-945-1550.

Public Meetings

MMWD's Board of Directors meets at 7:30 p.m. on the first and third Tuesdays of every month in the MMWD Board Room, 220 Nellen Avenue, Corte Madera, unless otherwise noticed. All board meetings are open to the public.

General Information About Drinking Water and Potential Contaminants

Federal regulations require us to include the following information in this report. Because it is general information, it does not necessarily apply to the drinking water provided by MMWD. Information specific to MMWD's drinking water can be found in the tables on the reverse.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source (untreated) water include:

- Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

- Inorganic contaminants, such as salts and metals, that can be naturally occurring or can be the result of urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, agricultural applications, and septic systems.
- Radioactive contaminants, which can be naturally occurring or can be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. State Board regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.