



## City of Rio Vista Water Quality Report for Calendar Year 2010 Prepared July 2011

This is the annual report on the quality of water delivered to you by the City of Rio Vista during calendar year 2010. The City of Rio Vista vigilantly safeguards its water supplies and distribution system. We are proud to report that this year, as in years past, all distributed drinking water for 2010 met all State and Federal drinking water health standards.

This report provides a snapshot of the quality of the water that we provided this year. Included are details about where your water comes from, what it contains, and how it compares to State and Federal standards. For more information about your water, you may call Dave Melilli, City of Rio Vista Public Works Director at (707) 374-6451.

Your water comes from seven wells located at various locations within the city, designated by location as Well 7, Well 9, Well 10, Well 11, Well 13, Well 14 and 15. During the past year 773,025,000 gallons of water were pumped from these wells for residential, commercial and industrial uses.

**NOTE: Well 10, with high arsenic levels, which was not used in 2010, will only be used as back up and for fire protection.**

The water distribution system includes over 18 miles of pipe and two reservoir tanks, each with a capacity of two million gallons.

Well water is cleaner than surface (river and lake) water. This is because the rains and irrigation fall on the land and percolate through the soil and porous rock until it collects in an aquifer. This may take weeks, months or years, depending on the geologic conditions and frequency of rainfall. So by the time it's pumped from an aquifer, nature has done an excellent job of cleaning it up.

However, as water travels over the surface of the land and through the ground, it dissolves naturally occurring minerals and, in some cases, substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

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

*Inorganic contaminants*, such as salts and metals, which can be naturally occurring or result from urban water runoff, industrial or domestic wastewater discharges, oil and gas production, mining and farming.

*Organic chemical contaminants*, including synthetic and volatile organic chemicals, which are by products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

*Pesticides and herbicides*, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

*Radioactive contaminants*, which can be naturally occurring or the result of oil production and mining activities

Because of these possible contaminants, we must monitor, prevent and/or treat for these contaminants so that the water delivered to your tap is absolutely safe. In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency and the California Department of Health Services prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. These regulations require extensive sampling and

testing. All samples for testing are taken at the wells except the samples for microbiological contaminants, lead and copper which are taken at selected individual residences.

The following is a report of the chemical and physical characteristics of the water supplied by the City of Rio Vista. This report is required each year by the California Department of Health Services and the United States Environmental Protection Agency for all water systems.

The table below lists all the drinking water contaminants that we detected during the 2010 calendar year. The data presented in this table is from testing done from January 1 through December 31, 2010.

**Definitions and Legend:**

**MCL (maximum contaminant level):** The highest level of contaminant allowed in drinking water. Primary MCL's 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.

**AL (action level):** The regulatory level at which a water system must provide additional treatment.

**MCLG (maximum contaminant level goal):** The level of contaminant in drinking water below which there is no known or expected risk to health. Set by the U.S. Environmental Protection Agency.

**PHG (public health goal):** The level of contaminant in drinking water below which there is no known or expected risk to health. Set by the California Environmental Protection Agency.

**PDWS (primary drinking water standard):** MCLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

**NA (not applicable or no standard determined).**

**ND (not detected at measurable amounts).**

**ppm (parts per million) = mg / liter (milligrams per liter).**

**ppb: (parts per billion) = ug / liter (micrograms per liter).**

**pCi / L: (picocurie / liter).**

Each year the Rio Vista water system is tested for over 90 contaminants. Except for microbiological and organic contaminants, only the detected contaminants are listed in this report.

Organic					
Contaminants	Highest No. of Detections	No. of Months in Violation	MCL	MCLG	Typical Sources of Contaminant
ND	0	0	0	0	NA

Inorganic						
Detected Contaminants	Units	MCL	PHG (MCLG)	Result		Typical Sources of Contaminant
				Average	Range	
Hardness	ppm	NA See Note 2	NA	63	29 - 103	Naturally occurring in ground water and surface water
Arsenic (As)	ppb	10 See Note 3	NA	9.5	6 - 19	Erosion of natural deposits, runoff from orchards, glass and electronics

						production wastes
Nitrate (NO3)	ppm	45 See Note 4	45	4.8	ND – 12	Runoff and leaching from fertilizer use, leaching from septic tanks and sewage, erosion of natural deposits
Benzene	ppb	1 See Note 5	0.15	ND	ND	Leaching from gas storage and land fill
Gross Alpha	pCi / L	15 See Note 6	15	1.7	1-2	Erosion of natural deposits
Total Radium 228	pCi / L	5 See Note 7	NA	0.86	ND – 0.9	Erosion of natural deposits

**Note 2:** A hardness of 60 is considered slightly hard and a hardness of 120 is considered moderately hard. There is no convincing evidence that water hardness causes adverse health effects. It is primarily a nuisance problem resulting in difficulty in cleaning and laundering tasks, and decreased efficiency of water heaters.

**Note 3:** When arsenic levels exceed the MCL of 10 parts per billion from wells 11 and 14, water from these wells are blended with water from wells with arsenic levels low enough to reduce the overall level below 10. The Trilogy two million gallon reservoir tank is used for blending. The following table illustrates the variation of test results from each well and indicates the data necessary to properly blend water from multiple sources to assure the delivered level meets State requirements. Well 10, with high arsenic levels, cannot be blended with other city wells.

ARSENIC LEVELS AT EACH WELL			Arsenic levels vary at each well from minimum to maximum values depending upon many factors including pumping rate and conditions within the aquifer. Many tests are run to assure accurate data when blending water from different wells to assure the overall level is below 10.  (10 parts per billion is about equal to 45 drops in a 60,000 gallon swimming pool.)
WELL	MINIMUM	MAXIMUM	
7	8	10	
9	6	9	
10	15	19	
11	6	8	
13	8	10	
14	10	12	
15	7	9	
Tank # 1	9	10	
Tank # 2	7	10	Trilogy Storage Tank

Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

**Note 4:** Nitrate in drinking water at level above the MCL is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above the MCL may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies.

**Note 5:** Benzene in drinking water at a level above the MCL may result in health problems for infants, children and adults.

**Note 6:** Gross Alpha in drinking water at a level above the MCL may result in an increased risk of cancer.

**Note 7:** Radium in drinking water at a level above the MCL may result in an increased risk of cancer.

Detection of Federal Disinfectant/Disinfectant By-products						
Detected Contaminants	Unit	MCL	PHG (MCLG)	Result		Typical Sources of Contaminant
				Average	Range	
Total Trihalomethanes	ppb	80	NA	9.9	ND – 35.5	By-product of drinking water disinfection


**Note 8:** Some people who use water containing trihalomethanes in excess of the MCL over many years may experience liver, kidney, or central nervous system problems, and may have an increased risk of getting cancer.

**Contaminants that may be present in source water include:**

- Microbial contaminants, Inorganic contaminants, pesticides and herbicides, radioactive contaminants and organic chemical contaminants.  
Refer to page 1 for descriptions.

**In order to ensure that tap water is safe to drink,** the USEPA and the California Department of Health Services (Department) prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

**Tables 1,2,3,4,5,6 and 7 list all of the drinking water contaminants that were detected during the most recent sampling for the constituents.** The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The Department allows us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, through representative of the water quality, are more than one year old.

Any shaded areas in Tables 1 – 7 indicate violations of MCL,AL or MRDL. Additional information regarding the violation is provided later in this report.

<b>TABLE 1 - SAMPLING RESULTS SHOWING THE DETECTION OF COLIFORM BACTERIA</b>					
<b>Microbiological Contaminants</b> (complete if bacteria detected)	<b>Highest No. of Detections</b>	<b>No. of Months in Violation</b>	<b>MCL</b>	<b>MCLG</b>	<b>Typical Sources of Contaminant</b>
Total Coliform Bacteria	2/mo. (2010)	1	no more than 1 positive monthly sample	0	Naturally present in the environment.

Any violation of MCL,AL or MRDL is shaded. Additional information regarding the violation is provided on page 6.

<b>TABLE 2 - SAMPLING RESULTS SHOWING THE DETECTION OF LEAD AND COPPER</b>						
<b>Lead and Copper</b> (complete if lead or copper detected in the last sample set)	<b>No. of Samples Collected</b>	<b>90th Percentile Level</b>	<b>No. Site Exceeding AL</b>	<b>AL</b>	<b>PHG</b>	<b>Typical Sources of Contaminant</b>
Lead (Pb) (ppb)	20 (2010)	5.80	0	15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers, erosion of natural deposits
Copper (ppm)	20 (2010)	0.071	0	1.3	.17	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

<b>TABLE 3 - SAMPLING RESULTS FOR SODIUM AND HARDNESS</b>						
<b>Chemical or Constituent</b> (and reporting units)	<b>Sample Date</b>	<b>Level Detected</b>	<b>Range of Detections</b>	<b>MCL (MRDL)</b>	<b>PHG (MCLG)</b>	<b>Typical Sources of Contaminant</b>
Sodium (ppm)	2010	146	127 - 157	none	none	Salt present in the water and is generally naturally occurring

**TABLE 3 - SAMPLING RESULTS FOR SODIUM AND HARDNESS**

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL (MRDL)	PHG (MCLG)	Typical Sources of Contaminant
Hardness (ppm)	2010	63	29 - 103	none	none	Sum of polyvalent cations present in the water, generally magnesium and calcium, and are usually naturally occurring

**TABLE 4 - DETECTION OF CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD**

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL (MRDL)	PHG (MCLG) [MRDLG]	Typical Sources of Contaminant
Aluminum (Al) ppm	2010	0.003	ND - 0.01	1	0.6	Erosion of natural deposits; residue from some surface water treatment processes
Arsenic (As) ppb	2010	9.5	6 - 19	10	n/a	Erosion of natural deposits; runoff from orchards, glass and electronics production wastes
Barium (Ba) ppm	2010	0.03	0.03 - 0.04	1	2	Discharge from oil drilling wastes and from metal refineries; erosion of natural deposits
Chromium (Total Cr) ppb	2010	1	ND - 2	50.0	n/a	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Fluoride (F) ppm	2010	0.1	ND - 0.2	2	1	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories.
Nickel ppb	2010	0.3	ND - 1	100	12	Erosion of natural deposits; discharge from metal factories
Nitrate (NO3) ppm	2010	4.8	ND - 12	45	45	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Nitrate + Nitrite as N ppm	2010	1.5	ND - 2.6	10	10	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Selenium (Se) ppb	2010	9.3	2 - 19	50	30	Discharge from petroleum, glass, and metal refineries; erosion of natural deposits; discharge from mines and chemical manufacturers; runoff from livestock lots(feed additive)
Gross Alpha pCi/L	2010	1.7	2 - 2	15	n/a	Erosion of natural deposits.
Total Radium 228 pCi/L	2010	0.86	0.9 - 0.9	5	n/a	Erosion of natural deposits

Any violation of MCL,AL or MRDL is shaded. Additional information regarding the violation is provided on page 7.

**TABLE 5 - DETECTION OF CONTAMINANTS WITH A SECONDARY DRINKING WATER STANDARD**

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL (MRDL)	PHG (MCLG)	Typical Sources of Contaminant
Chloride ppm	2010	60	38 - 75	500	n/a	Runoff/leaching from natural deposits; seawater influence

**TABLE 5 - DETECTION OF CONTAMINANTS WITH A SECONDARY DRINKING WATER STANDARD**

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL (MRDL)	PHG (MCLG)	Typical Sources of Contaminant
Iron (Fe) ppb	2010	60	ND - 100	300	n/a	Leaching from natural deposits; Industrial wastes
Manganese (Mn) ppb	2010	73	ND - 150	5	9	Leaching from natural deposits
Specific Conductance umhos/cm	2010	717	590 - 818	1600	n/a	Substances that form ions when in water; seawater influence
Sulfate (SO4) ppm	2010	30.00	16 - 48	500	n/a	Runoff/leaching from natural deposits; industrial wastes
TDS ppm	2010	412	330 - 470	1000	n/a	Runoff/leaching from natural deposits

Any violation of MCL,AL or MRDL is shaded. Additional information regarding the violation is provided on page 7.

**TABLE 6 - DETECTION OF UNREGULATED CONTAMINANTS**

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	Notification Level	Health Effects Language
Boron ppm	2010	0.8	0.6 - 1 (2010)	1000	The babies of some pregnant women who drink water containing boron in excess of the notification level may have an increased risk of developmental effects, based on studies in laboratory animals.
Vanadium ppm	2010	0.001	ND - 0.004 (2010)	50	The babies of some pregnant women who drink water containing vanadium in excess of the action level may have an increased risk of developmental effects, based on studies in laboratory animals.

**TABLE 7 - DETECTION OF FEDERAL DISINFECTANT/DISINFECTANT BYPRODUCT RULE**

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL (MRDL)	PHG (MCLG)	Typical Sources of Contaminant
Total Trihalomethanes (TTHMs) ppb	2010	9.9	ND - 35.5	80	n/a	By-product of drinking water disinfection
Haloacetic Acids (five) ppb	2010	0.3	ND - 2	60	n/a	By-product of drinking water disinfection

**\*FAILED TEST**

1) 10/5/10 – Bass Derby temporary water lines: Initial test failed. Water lines were re-tested after flushing on the day and passed test. No water was delivered until passing test.

2) 5/3/10 – After well construction, Well 10's initial test failed. After continuous flushing of the well, on 5/20/10, Well 10 was re-tested and passed all tests. During this time, no water from this well was distributed to the public.

## Summary Information for Contaminants Exceeding an MCL, MRDL, or AL, or a violation of Any Treatment Technique or Monitoring and Reporting Requirement

### Additional General Information on Drinking Water

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 (800-426-4791).

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. These people should seek advice about drinking water from their health care provider. 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 (800-426-4791)

**For Lead (Pb),** If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. *City of Rio Vista* is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

**About our Total Coliform Bacteria:** Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.

**For Arsenic (As) results above 5 ppb up to and including 10 ppb:** Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

**About our Manganese (Mn):** Manganese was found at levels that exceed the secondary MCL. The Manganese MCL was set to protect you against unpleasant aesthetic affects such as color, taste, odor and the staining of plumbing fixtures (e.g., tubs and sinks), and clothing while washing. Violating this MCL does not pose a risk to public health.

Manganese (Mn) result found exceeded California Department of Public Health(CDPH) notification level. The notification level for manganese is used to protect consumers from neurological effects. High levels of manganese in people have been shown to result in effects of the nervous system.



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