2022

CITY OF VACAVILLE

WATER QUALITY REPORT

TO

CONSUMERS

The City of Vacaville (City) wants you, our customers, to know that your water system has met all water quality standards and is a safe and reliable drinking water supply. These standards are established by the U.S. Environmental Protection Agency (USEPA) and the California State Water Resources Control Board (SWRCB). In 2022, the City distributed over 5.77 billion gallons of high quality drinking water. This water was subjected to extensive testing, not only for regulated contaminants, but for many non-regulated chemical properties as well. More than 8,000 analyses were performed on drinking water samples in 2022.

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 at (800) 426-4791. If you have further questions, please contact the Water Quality Laboratory Supervisor, Michael Torres, by phone at (707) 469-6439 or by email at Michael.Torres@cityofvacaville.com. You may also attend City Council Meetings to voice your opinions. Please check the City website for meeting notices to see if any water related topics are on the agenda.

Este informe contiene información muy importante sobre su agua para beber. Favor de comunicarse City of Vacaville Water Quality Laboratory at (707) 469-6400 para asistirlo en español.

HEALTH RELATED INFORMATION

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 for infections. These people should seek advice from their health care providers about drinking water.

USEPA and Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the USEPA's Safe Drinking Water Hotline, (1-800-426-4791).

ARSENIC IN DRINKING WATER

Vacaville Meets the Limit

While your drinking water meets the federal and state standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water.

The USEPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

SOURCES OF WATER AND CONTAMINANTS:

Vacaville's water supply consists of two surface water sources and 11 deep groundwater wells. Lake Berryessa surface water, conveyed through Putah South Canal (PSC), provided 41% of the City's total consumption of water in 2022, and Sacramento Delta surface water, from the North Bay Aqueduct (NBA), provided an additional 24%. Groundwater from the 8 deep wells currently in operation made up the balance (35%) of our water needs. Treatment of the surface water is divided between the Vacaville Water Treatment Plant (VWTP) and the North Bay Regional Water Treatment Plant (NBR). The VWTP treats PSC source water only, while the NBR plant, which is jointly owned by the cities of Vacaville and Fairfield, treats both PSC and NBA source water.

The sources of drinking water (both tap and bottled water) includes 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 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 result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
· Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
· Organic chemical contaminants, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
· Radioactive contaminants that can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the USEPA and the SWRCB prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. SWRCB regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

The following tables list all of the drinking water contaminants that were detected during the most recent sampling for constituents. To read the tables, start with the far left column titled *Constituent* or *Contaminant* and read across the row. Units express the amount measured. MCL shows the highest amount of the substance allowed. PHG (MCLG) is the goal amount for that substance, which may be a lower amount than the amount allowed. The *Range* reports the lowest and highest amounts detected and the *Average* is the annual average. *Contaminant Sources* describe where the substance usually originates. To better understand the report, use the Legend that defines the terms used.

Table 1- SAMPLING RESULTS SHOWING THE DETECTION OF COLIFORM BACTERIA

Microbiological Contaminant	Highest No. of Detections	No. of Months in Violation	MCL	MCLG	Contaminant Sources
Total Coliform Bacteria	0%	0	5% (1351 samples collected in 2022)	0	Naturally present in the environment.
Fecal Coliform Bacteria	0	0	A routine sample and a repeat sample detect for total coliform and either sample also detects for fecal coliform.	0	Human and animal fecal waste.

Table 2 - SAMPLING RESULTS SHOWING THE DETECTION OF LEAD AND COPPER IN DISTRIBUTION SYSTEM

Constituent (reporting units)	No of samples (2020)	90th Percentile Detected	No. Sites exceeding AL	AL	PHG	Contaminant Sources
Lead (ppb) [a]	33	<0.005	0	15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits.
Copper (ppm)[a]	33	0.16	0	1.3	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

In 2018 The City of Vacaville had 18 school samplings for the Lead in Schools Program. Sample locations within those schools did not exceed action levels or require additional action by the school.

Table 3 - SAMPLING RESULTS FOR SODIUM AND HARDNESS [b]

Constituent (reporting units)	2020-2021 GROUNDWATER Range	2020-2021 GROUNDWATER Average	2022 TREATED SURFACE WATER from NBR Range	2022 TREATED SURFACE WATER from NBR Average	2022 TREATED SURFACE WATER from VWTP Range	2022 TREATED SURFACE WATER from VWTP Average	
Hardness (ppm)	81-310	181	181-199	189	180	180	Sum of polyvalent cations present in the water, generally magnesium and calcium, and are usually naturally occurring.
Sodium (ppm)	40-77	54	12.0-32.0	17.5	15	15	Salt present in the water and is generally naturally occurring.

Table 4 - DETECTION OF CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

Constituent (reporting units)	MCL	PHG (MCLG)	2020-2022 GROUNDWATER Range	2020-2022 GROUNDWATER Average	2022 TREATED SURFACE WATER from NBR Range	2022 TREATED SURFACE WATER from NBR Average	2022 TREATED SURFACE WATER from VWTP Range	2022 TREATED SURFACE WATER from VWTP Average	Contaminant Sources
Aluminum (ppm)	1	0.6	nd	nd	nd - 0.09	<0.05	nd	nd	Erosion of natural deposits; residue from some surface water treatment processes
Antimony (ppb)	6	1	nd	nd	nd - 2.1	0.5	nd	nd	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic (ppb)	10	0.004	nd - 7.03	2.39	nd - 2.1	0.5	2.7	2.7	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Barium (ppm)	1	2	nd - 0.14	0.08	nd - 0.1	nd	0.1	0.1	Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits
Chromium, total (ppb)	50	(100)	nd - 22	7.8	nd	nd	nd	nd	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits.
Fluoride (ppm)[c]	2.0	1	System-wide annual average = 0.72, minimum = 0.60, maximum = 0.87						Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories.
Nitrate as N (ppm)	10	10	nd - 3.6	1.6	nd - 0.7	0.2	nd	nd	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Gross Alpha Activity (pCi/L)	15	0	1.9 - 4.1	3.1	nd	nd	2.8	2.8	Erosion of natural deposits

Table 5 - DETECTION OF CONTAMINANTS WITH A SECONDARY DRINKING WATER STANDARD [d]

Constituent (reporting units)	MCL	2020-2022 GROUNDWATER Range	2020-2022 GROUNDWATER Average	2022 TREATED SURFACE WATER from NBR Range	2022 TREATED SURFACE WATER from NBR Average	2022 TREATED SURFACE WATER from VWTP Range	2022 TREATED SURFACE WATER from VWTP Average	Contaminant Sources
Turbidity (units)[e]	TT=5.0 NTU TT=95% of samples ≤0.5 NTU	nd - 0.14	0.08	0.05 - 0.07	0.06	0.14	0.14	Soil runoff.
Odor- Threshold (units)	3	nd - 5.3	1.2	1.4	1.4	2.3	2.3	Naturally-occurring organic materials.
Chloride (ppm)	500	7.8 - 35	17	8.7 - 18	12	12	12	Runoff/leaching from natural deposits; seawater influence.
Sulfate (ppm)	500	20 - 69	42	25 - 63	35	22	22	Runoff/leaching from natural deposits; seawater influence.
Total Dissolved Solids (ppm)	1000	290 - 530	377	209 - 284	243	210	210	Runoff/leaching from natural deposits.
Specific Conductance (µS/cm)	1600	440 - 790	567	362 - 476	408	400	400	Substances that form ions when in water; seawater influence.

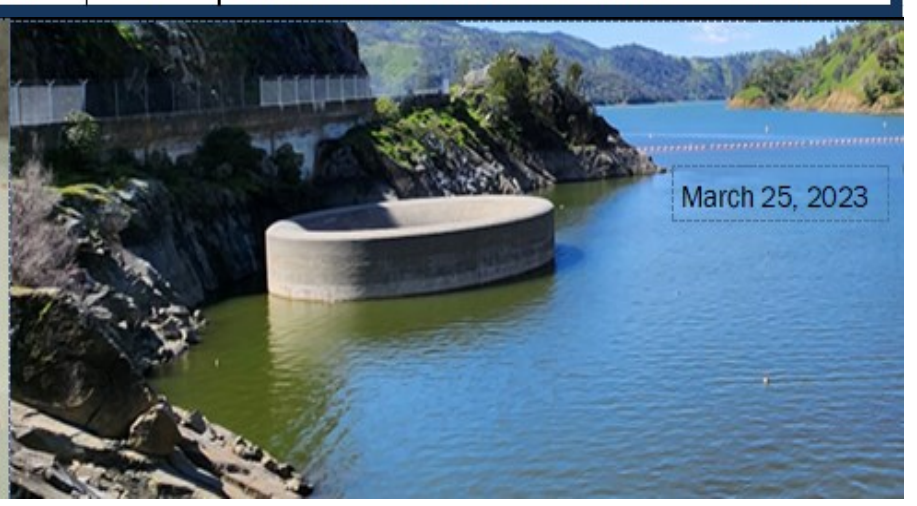


Table 6 - DETECTION OF UNREGULATED CONTAMINANTS (Hexavalent Chromium and UCMR4)

Constituent (reporting units)	Sampling Date	Source Water		Distribution System		PHG (MCLG)	
		Range	Average	Range	Average		
Hexavalent Chromium (ppb)	2020-2022	1.6 - 22	11	nd - 2.6	0.9	0.020	Some people who use water containing chromium in excess of the MCL over many years may experience allergic dermatitis. (f)
Bromide (ppb)	Feb-Oct 2019	nd - 55.0	16.7	na	na	na	Unregulated contaminant monitoring helps the USEPA and the Cal EPA determine where certain contaminants occur and whether the contaminants need to be regulated. The City of Vacaville completed the UCMR4 program data collection in 2019. **Haloacetic acids (HAAs) are a type of chlorination disinfection by-product (CDBP) that are formed when the chlorine used to disinfect drinking water reacts with naturally occurring organic matter in water. HAAs are a collection of several different compounds. The sum of Bromodichloroacetic Acid (BrCl2AA), Dibromochloroacetic Acid (Br2ClAA), and Tribromoacetic Acid (Br3AA) concentrations is known as HAA3. The sum of Monochloroacetic Acid (ClAA), Monobromoacetic Acid (BrAA), Dichloroacetic Acid (Cl2AA), Trichloroacetic Acid (Cl3AA), and Dibromoacetic Acid (Br2AA) concentrations are known as HAA5. HAA6 refers to the sum of HAA5 and Bromochloroacetic Acid (BrClAA) concentrations. HAA6 and HAA3 together make up HAA9
Total Organic Carbon (ppm)		2.6 - 8.9	3.7	na	na	na	
Manganese (ppb)		nd - 5.0	0.6	na	na	na	
HAA5 (ppb) **		na	na	0.4 - 35	8.8	60	
HAA6 Br (ppb) **		na	na	nd - 10.5	5.1	na	
HAA9 (ppb) **		na	na	0.4 - 40	13	na	

Table 7 - DETECTION OF DISINFECTION BYPRODUCTS

Constituent (reporting units)	MCL	PHG (MCLG)	Range	Average	Violations	Contaminant Sources
Total Trihalomethanes (ppb)	80	na	1.4 - 60	39	0	By-product of drinking water disinfection.
Halo-Acetic Acids (ppb)	60	na	<2.0 - 26	12	0	By-product of drinking water disinfection.

Constituent (reporting units)	MCL or MRDL	MCLG or MRDLG	Average	Minimum	Maximum	Contaminant Sources
DBP Precursors/TOC (ppm)	TT	-	2.5	2.1	2.8	Various natural and man-made sources.
Chlorine (ppm)	4	4	0.76	<0.1	1.39	Drinking water disinfectant added for treatment

LEGEND

MCL (Maximum Contaminant Level: 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 MCL: Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.
MCLG (Maximum Contaminant Level Goal): 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.
PHG (Public Health Goal): 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.
PDWS (Primary Drinking Water Standard): MCLs, MRDLs and treatment techniques (TTs) for contaminants that affect health, along with their monitoring and reporting requirements.
MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants
AL & NL (Regulatory Action Level or Notification Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow
TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.
na: Not Applicable or Not Available.
nd: Not Detected.
ntu (Nephelometric Turbidity Units): Standard unit for turbidity.
pCi/L: Picocuries per Liter.
µS/cm: Microsiemens Per Centimeter. Unit of measure for conductance.
ppm: Parts Per Million or Milligrams Per Liter (mg/L). Equivalent to 1 second in 11.5 days.
ppb: Parts Per Billion or Micrograms Per Liter (µg/L). Equivalent to 1 second in 32 years.

FOOTNOTES

(a) This is the state action level for samples collected inside schools and homes. The 90th percentile reflects the concentration of lead or copper at which 90% of the samples tested were found to have not exceeded. Household lead and copper results are from August-September 2020.

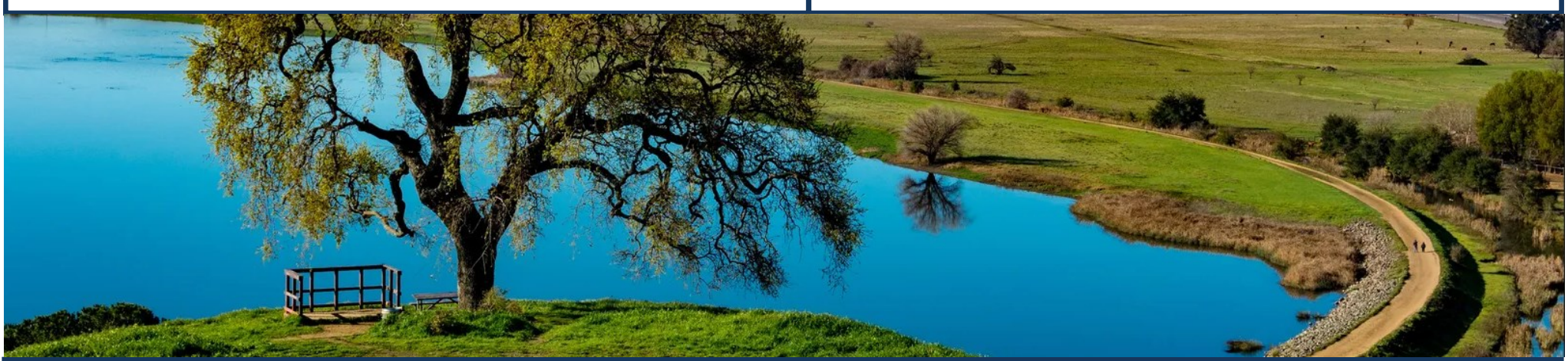
(b) There are no drinking water standards (MCLs, PHGs or MCLGs) for these constituents, they are just reported for customer information. To convert hardness data from ppm to grains per gallon, divide by 17.1.

(c) Not possible to differentiate water source. The City of Vacaville treats the water by adding fluoride to the naturally occurring level to help prevent dental caries in consumers. The fluoride levels in the treated water are maintained within the range of 0.7 - 1.3 ppm, as required by the California Department of Public Health regulations.

(d) Secondary MCLs do not have PHGs or MCLGs because secondary MCLs are set to protect the aesthetics (odor, tastes, and appearance) of drinking water, and PHGs and MCLGs are based on health concerns.

(e) Turbidity is a measure of the cloudiness of the water and is a good indicator of water quality. High turbidity can hinder the effectiveness of disinfectants.

(f) There is currently no MCL for hexavalent chromium.



KEEP THE LEAD OUT OF DRINKING WATER

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. The City is responsible for providing high quality drinking water but can not always 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/lead .

POLICY ON NONDISCRIMINATION ON THE BASIS OF DISABILITY

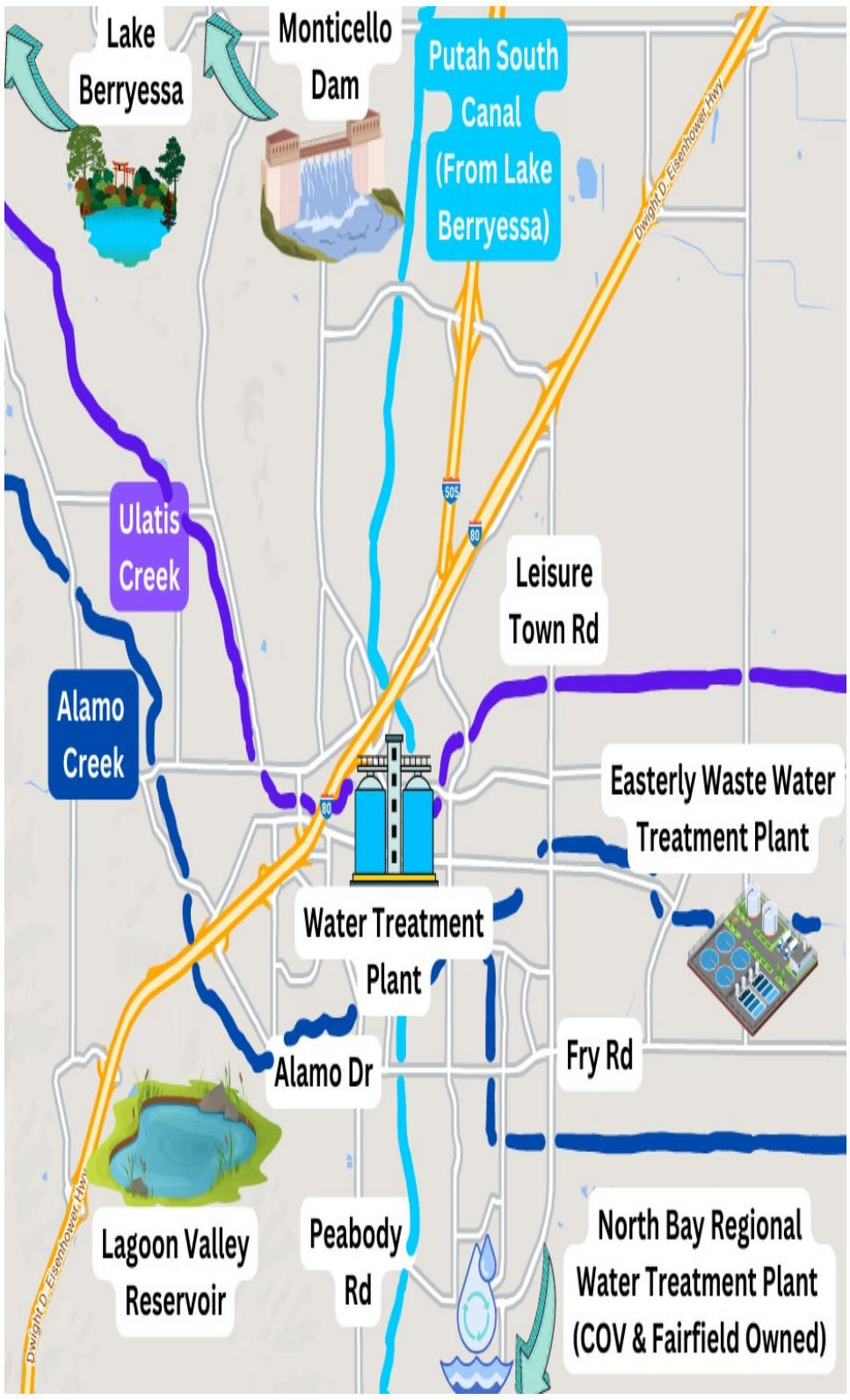
In accordance with the requirements of Title II of the Americans with Disabilities Act of 1990, the City of Vacaville (City) does not discriminate against qualified individuals with disabilities on the basis of disability in the City's services, programs, activities, or employment. Information, comments, requests for accommodations or barrier removal, and/or complaints concerning the accessibility of City programs, services or activities to persons with disabilities should be directed to the City's ADA Coordinator, 650 Merchant Street, (707) 449-5409 or (707) 449-5162 (TTY).

WATERSHED SANITARY SURVEYS AND VULNERABILITY SUMMARIES

A Watershed Sanitary Survey evaluates the quality of water that is used in a community drinking water supply in order to identify factors and constituents having the capacity to compromise drinking water quality. The *California State Water Project 2021 Watershed Sanitary Survey Update* (completed in June, 2022) is latest summary report for the Sacramento Delta which includes the North Bay Aqueduct (NBA). The Solano County cities treating NBA water, in conjunction with the Solano County Water Agency, have implemented watershed management practices to improve water quality and reduce the significance of the potential contaminant sources.

The latest Watershed Sanitary Survey (*Solano Project Below Monticello Dam 2017 Watershed Sanitary Survey*) for Putah South Canal (PSC) was completed in 2018. The results of the assessment survey indicated that PSC is most vulnerable to illegal activities/ unauthorized dumping and herbicide application. Management measures along the canal have been implemented that mitigate the risk for each of these potential contributing activities.

The summaries for Vacaville's groundwater wells were performed in 2002, 2003, and 2005. The wells are considered most vulnerable to automobile gas stations, chemical and petroleum processing and storage, dry cleaners, septic systems, sewer collection systems, agricultural drainage, agricultural wells and irrigation wells. The wells offer various levels of protection from possible contaminating activities (PCAs) due to factors such as the aquifer, deep water table intakes, well construction features and physical barriers. Copies of the Watershed Sanitary Surveys can be obtained through the SWRCB, Division of Drinking Water (DDW), San Francisco District Office, 850 Marina Bay Parkway, Bldg P, 2nd Floor, Richmond, California 94804. You may request that a summary be sent to you by contacting the SWRCB, Division of Drinking Water, at (510) 620-3474.



Source of your water. Map is not to scale, but gives you a relative idea of the location of water sources for the City of Vacaville.

HEXAVALENT CHROMIUM IN VACAVILLE'S DRINKING WATER

Chromium is a metallic chemical that occurs naturally in some of Vacaville's deeper ground water aquifers. Chromium may be present in water sources in two forms: trivalent chromium (Cr+3) and hexavalent chromium (Cr+6). The combination of both forms is referred to as Total Chromium. Chromium+3 is found naturally in foods at low levels and is an essential human dietary nutrient that is often medically prescribed to maintain healthy insulin metabolism. Chromium+6 is the toxic form of chromium that has been found to cause cancer in humans when inhaled and is suspected to cause cancer when ingested.

In 2014 the Maximum Contaminant Level (MCL) set by the California State Water Resources Control Board (SWRCB) for Total Chromium (combined Cr+3 & Cr+6) was 50 ppb, and an MCL specifically for Cr+6 was set at 10 ppb. In September 2017, State of California withdrew the Cr+6 10 ppb MCL and returned solely to the current Total Chromium MCL of 50 ppb whereas the USEPA limit continued to be 100 ppb. As of production of this publication, the SWRCB is still in the process to set a new level as low as technologically and economically feasible with the emphasis placed primarily on the protection of public health.

The City of Vacaville's wells are all currently in compliance within the 50-ppb limit, and we will make any modifications needed to meet new regulations when they are adopted.