

INDIAN WELLS VALLEY WATER DISTRICT

July 1, 2019

To: Board of Directors

From: Renee Morquecho, Chief Engineer

Subject: Required Report on Public Health Goals

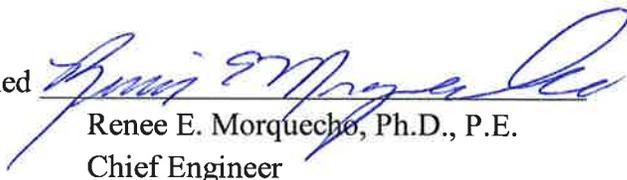
Attached for your review and approval is a report prepared by staff comparing our District's drinking water quality with the public health goals (PHGs) adopted by California EPA's Office of Environmental Health Hazard Assessment (OEHHA) and with maximum contaminant level goals (MCLGs) adopted by the USEPA. PHGs and MCLGs are not enforceable standards and no action to meet them is mandated.

SB1307 (Calderone-Sher; effective 1-1-97) added new provisions to the California Health and Safety Code which mandate that a report be prepared by July 1, 1998, and every three years thereafter. The attached report is intended to provide information to the public in addition to the Annual Water Quality Report that is provided to each customer.

Our water system complies with all of the health-based drinking water standards and maximum contaminants levels (MCLs) required by the California Water Resources Control Board Division of Drinking Water and the USEPA. No additional actions are recommended.

The law requires that a public hearing be held (which can be part of a regularly scheduled public meeting) for the purpose of accepting and responding to public comment on the report. This public hearing will be scheduled as part of our regular board meeting on August 12, 2019 and will be noticed as required for public hearings.

Signed


Renee E. Morquecho, Ph.D., P.E.
Chief Engineer



INDIAN WELLS VALLEY WATER DISTRICT 2019 REPORT ON WATER QUALITY RELATIVE TO PUBLIC HEALTH GOALS

Executive Summary

The water served by the Indian Wells Valley Water District meets all State of California Water Resources Control Board (SWRCB) and United States Environmental Protection Agency (USEPA) drinking water standards set to protect public health. This special report is required of large systems every 3 years to report on any constituents exceeding a non-enforceable Public Health Goal (PHG) or Maximum Contaminant Level Goal (MCLG). Between 2016 and 2018, the PHG/MCLG was exceeded for fluoride, arsenic, chromium VI, coliform bacteria and gross alpha. There are Best Available Technologies (BATs) available to reduce the amount of each of these constituents but the cost is prohibitive and the effectiveness of the treatment processes to provide any significant reductions in constituent levels at these already low values is uncertain. In addition, the health protection benefits of these further hypothetical reductions are not at all clear and may not be quantifiable. Therefore, no action is proposed at this time.

What are Public Health Goals (PHGs)?

PHGs are water quality goals set by the California Office of Environmental Health Hazard Assessment (OEHHA) 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 SWRCB Division of Drinking Water (DDW) 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.

Reporting Requirements

Provisions of the California Health and Safety Code specify that larger (>10,000 service connections) water utilities prepare a special report if their water quality measurements have exceeded any PHGs. Reporting must be done every 3 years. The law also requires that where OEHHA has not adopted a PHG or a contaminant, the water suppliers are to use the MCLGs adopted by USEPA.

The purpose of this report is to inform consumers of contaminants in IWVWD drinking water that exceed the PHGs or MCLGs during 2016, 2017 and 2018. Included are 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 contaminant, the best treatment technology available

that could be used to reduce the contaminant level, and an estimate of the cost of treatment if it is appropriate and feasible. For general information about our water quality, please refer to the latest Annual Water Quality Report that was delivered to customers May 2019. The report can be found on our website at www.iwvwd.com/ccr/2018.pdf.

Water Quality Data Considered

The water quality data collected by IWVWD between 2016 and 2018 were considered for the purpose of determining compliance with drinking water standards and PHG reporting requirements. This data is all summarized in the District's Annual Water Quality Reports. For each regulated contaminant, SWRCB DDW establishes Detection Limits for Purposes of Reporting (DLR). DLRs are the minimum levels at which any analytical result must be reported to SWRCB and are usually limited by the technology available for detecting a contaminant. Analytical results below the DLRs cannot be quantified with any certainty. In many cases, PHGs are set below the DLRs. Any contaminant reported below the DLR will be considered zero for the purpose of this report, which is accepted by the SWRCB.

Guidelines Followed

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

Best Available Treatment Technology and Cost Estimates

Both the USEPA and the SWRCB adopted what are known as Best Available Technologies (BATs) which are the best methods of reducing contaminant levels to the MCL. Costs can be estimated for such technologies. However, since many PHGs and 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. The costs estimated below do not include engineering, environmental, or construction costs.

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 wells at levels above the PHG, or if no PHG, above the MCLG.

Fluoride: Fluoride is the name given to a group of compounds that are composed of the naturally occurring element fluorine and one or more other elements. Fluorides are present naturally in water and soil at varying levels. Most water supplies contain some naturally occurring fluoride. In the 1940s, scientists discovered that people who lived where drinking water supplies had naturally occurring fluoride levels of approximately 1 part per million (ppm) or greater had fewer dental caries (cavities) than people who lived where fluoride levels in drinking water were lower. Many more recent studies have supported this finding.

The California Department of Health Services (predecessor to SWRCB), adopted regulations in 1998 that establish standards for the addition of fluoride to drinking water. The regulations are located in Title 22 of the California Code of Regulations (CCR) Sections 64433, et. seq.. The standards require fluoridating public water systems to maintain fluoride levels within a range that has been established for its climate. This is based on the concept that people in cooler climates typically drink less water per day than people in warmer climates. The optimal level for fluoride in the Indian Wells Valley is 0.8 ppm with a control range of 0.7 to 1.3 ppm. The average naturally occurring fluoride level in the District's wells is 0.7 ppm. The District is not required to add any additional fluoride to the drinking water.

The MCL for fluoride is 2.0 ppm; the PHG and MCLG is 1.0 ppm. We detected fluoride in one well in 2017 that exceed the PHG. The concentration of fluoride in Well 9A was 1.4 ppm.

The PHG for fluoride was established to prevent primarily dental fluorosis, or mottling of the teeth. Dental fluorosis is not a sign of fluoride poisoning. It is a condition where the dental hard tissues (enamel) are more porous than is found in normal enamel. Like many common substances vital for health (e.g. zinc and iron), fluoride can be poisonous in excessive amounts. Daily intake over many years of 20-80 milligrams or more, depending upon body weight, is required to produce symptoms of chronic poisoning. Doses such as these are associated with water supplies that contain at least 10 ppm of naturally-occurring fluoride. Millions of people have been consuming water containing natural or adjusted fluoride at 0.7 to 1.2 ppm throughout their lives with no adverse health effects.

The BAT for reducing fluoride in water (according to the EPA) is reverse osmosis or distillation. Blending is also a proven method for reducing fluoride in water. Currently, the water for Well 9A must be treated for arsenic and is pumped infrequently. When used, it does blend with water from other wells that serve the "A" pressure zone. Reducing the level of fluoride in one well would not be cost-effective when it can be blended with water from other wells.

Arsenic: Arsenic is a naturally occurring element in the earth's crust and is very widely distributed in the environment. All humans are exposed to microgram quantities of arsenic (inorganic and organic) largely from food and to a lesser degree from drinking water and air. In certain geographical areas, natural mineral deposits may contain large quantities of arsenic and this may result in higher levels of arsenic in water. Waste chemical disposal sites may also be a source of arsenic contamination of water supplies. Arsenic does not have a tendency to accumulate in the body at low environmental exposure levels. Studies in humans have shown considerable individual variability in arsenic toxicity. The levels of arsenic that most people ingest in food and water (ca. 50 µg/day) have not usually been considered to be of health concern for non-cancer effects.

The MCL for arsenic is 10 ppb, the PHG and MCLG for arsenic is 0.0004 ppb. We have detected concentrations of arsenic in raw water from all our wells above the PHG between 2016 and 2018. The maximum level detected was 57 ppb from Well 9A (January 2017) but raw water from Well 9A is treated for arsenic before being pumped to the distribution system. No water above the MCL of 10 ppb has been served from any well since August 1, 2011.

The health risk associated with arsenic, and the reason that a drinking water standard was adopted for it, is that people who drink water containing arsenic above the MCL throughout their lifetime could experience an increased risk of getting some cancers. The OEHHA (part of the California Environmental Protection Agency) has set the PHG at 4 parts per trillion (0.0004 ppb). The PHG is based on a level that will result in not more than 1 excess cancer in 1 million people who drink 2 liters daily of this water for 70 years. The actual cancer risk may be lower or zero.

The BETs for removal of arsenic in water are: activated alumina, coagulation/filtration, lime softening, ion exchange and reverse osmosis. The District is very familiar with the cost of treating wells for arsenic using coagulation/filtration technology. Most of the time, the District is reducing the arsenic concentrations in wells 9A, 10, 11 and 13 to non-detect levels (<2.0 ppb). Any results below the detection limit of 2.0 ppb is considered zero by the DDW. Currently, the approximate cost per 1,000 gallons to reduce arsenic is \$1.00, or \$22.00 per customer per year. This cost does not include debt service. If all the District's wells had to be treated for arsenic to below the DLR (in order to try and reach the PHG), the cost could be over \$2,000,000.00 per year or almost \$200.00 per customer per year. The cost could be much higher or lower depending on the technology chosen and size of facilities constructed.

Gross Alpha: Gross alpha activity detections are typically due to uranium. Exceedences of gross alpha particle activity can be considered a substitute for the uranium measurement if the gross alpha particle activity does not exceed 5 pCi/L. Wells 9A, 10, 11, 30, 31 and 34 were tested for gross alpha during the 2016-2018 time period. The range of detections was ND to 7.7 pCi/L.

The MCL for gross alpha is 15 pCi/L and the MCLG is zero. The Method Detection Limit is 3.0 pCi/L. Well 34 was the only well that tested below the MDL and therefore was reported as not detected.

The BET cited in the literature to remove gross alpha particle activity and uranium is reverse osmosis (RO). Treatment of water by RO is a costly and energy-consuming process for the removal of one constituent. Currently, the cost to remove gross alpha using RO treatment is approximately \$400 per AF. If all the District's wells had to be treated for gross alpha particle activity using RO, the cost could be almost \$3,000,000.00 per year or over \$200.00 per customer per year.

Chromium VI: Chromium is a heavy metal that occurs throughout the environment. The hexavalent form of chromium, commonly known as "chromium 6", can be toxic and has been known to cause cancer when inhaled or ingested. Much of the hexavalent chromium found in drinking water is naturally occurring, however there are areas of contamination in California from historic industrial use.

The State established an MCL for chromium VI in 2014 of 10 ppb, but the MCL was invalidated by the Superior Court of Sacramento County in 2017. Currently, hexavalent chromium in drinking water is regulated under the State's total chromium MCL of 50 ppb which includes all forms of chromium.

The PHG established in 2011 for chromium VI is 0.02 ppb. The District detected chromium VI in Wells 17 (2.5 ppb), 30 (1.6 ppb) and 31 (2.0 ppb) above the method detection limit of 0.14 ppb.

There are several BETs listed by the USEPA for reduction of chromium in drinking water, including RO. Using the estimated cost of treatment using RO stated above and the amount of water produced by Wells 17, 30 and 31 in 2018, the annual cost could be over \$1,500,000.00 per year and \$125 per customer per year. Even with the reduction of chromium, since the detection limit is above the PHG, there is no laboratory method that will detect chromium VI below the PHG and little information as to whether this level of reduction is "safer" than the current levels.

Coliform Bacteria: Coliform bacteria are an indicator organism that are ubiquitous in nature and are not generally considered harmful. They are used because of the ease in monitoring and analysis. If a positive sample is found and confirmed through repeat samples, it indicates a potential problem that needs to be investigated. It is not unusual for a system to have an occasional positive sample. It is difficult, if not impossible, to assure that a system will never get a positive sample.

The MCL for coliform bacteria is 5% positive samples of all samples collected during the month and the MCLG is zero. The coliform drinking water standard is set to minimize the possibility of the water containing pathogens which are organisms that cause waterborne disease. Because coliform is only a surrogate indicator of the potential presence of pathogens, it is not possible to state a specific numerical health risk. While USEPA normally sets MCLGs “at a level where no known or anticipated adverse effects on persons would occur”, they indicate that they cannot do so with coliforms.

The highest percentage of positive coliform samples during this period of 2016, 2017 and 2018 was 1.72%, 3.45%, and 4.92%, respectively. The District normally collects 52 coliform samples from the distribution system per month. Despite chlorination of our water and a strict procedure for collecting coliform samples, occasionally a sample is positive for coliform bacteria. All repeat samples were negative.

Recommendations for Further Action

The water served by the Indian Wells Valley Water District meets all State of California Water Resources Control Board Division of Drinking Water and USEPA drinking water standards set to protect public health. To further reduce the constituents identified in this report that are already significantly below the health-based Maximum Contaminant Levels established to provide “safe drinking water”, additional costly treatment process would be required. The effectiveness of the treatment processes to provide any significant reductions in constituent levels at these already low values is uncertain. In addition, the health protection benefits of these further hypothetical reductions are not at all clear and may not be quantifiable. Therefore, no action is proposed at this time.