June 15, 2010

MEMO TO THE BOARD OF DIRECTORS

Subject: Agenda Item No. 6.4 — Required Report on Public Health Goals- Review Final Draft & Set Public Hearing

Attachment: 1. Report on the District's Water Quality Relative to Public Health Goals, 2007 - 2009
2. ACWA Cost Estimates for Treatment Technologies
3. California Health and Safety Code §116470(b)

Attached for the Board's approval is the final draft of a report prepared by Staff comparing the District's drinking water quality with both Public Health Goals (PHGs) adopted by the California EPA's Office of Environmental Health Hazard Assessment (OEHHA) or maximum contaminant level goals (MCLGs) adopted by the US Environmental Protection Agency (USEPA). PHGs and MCLGs are not enforceable standards and no action to meet them is mandated.

SB 1307 (Calderone-Sher, Effective January 1, 1997) 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 mailed to each customer.

With the exception of total coliform bacteria in October 2009, the District complies with all of the maximum contaminant levels (MCLs) required by the California Department of Public Health (CDPH) and the USEPA. The District exceeded the PHG for total coliform bacteria, arsenic and copper, and the report addresses these exceedances.

The law requires that a public hearing be held for the purpose of accepting and responding to public comment on the Public Health Goal Report. It is recommended that this public hearing be scheduled as part of the regular Board Meeting of September 7, 2010. It will be noticed as required for public hearings.

RECOMMENDED BOARD ACTION

1. By MOTION, accept the Report on Public Health Goals dated June 15, 2010.
2. By MOTION, set the regular Board Meeting for Tuesday, September 7, 2010 for the public hearing.

By_____
Taj Dufour
Operations and Maintenance Manager

SOQUEL CREEK WATER DISTRICT
REPORT ON DISTRICT'S WATER QUALITY
RELATIVE TO PUBLIC HEALTH GOALS
2007 - 2009

Introduction

In accordance with California Health and Safety Code §116470(b), Soquel Creek Water District (SqCWD) has prepared this Public Health Goal (PHG) report. The Association of California Water Agencies (ACWA) formed a workgroup which produced guidelines for water utilities to use in preparing PHG reports. SqCWD used these ACWA guidelines, updated in 2010, in the preparation of our report. No guidance was available from state regulatory agencies.

The regulation, as interpreted by ACWA, specifies that every 3 years, larger water utilities (>10,000 service connections) prepare a report if their water quality measurements have detected and exceeded any PHG for constituents that also have an established California primary Maximum Contaminant Level (MCL) or action level. PHGs are non-enforceable goals established by the California Environmental Protection Agency's (EPA's) Office of Environmental Health Hazard Assessment (OEHHA). The law also requires that where OEHHA has not adopted a PHG for a particular constituent, the water suppliers are to use the Maximum Contaminant Level Goals (MCLGs) adopted by US EPA.

PHGs are set by OEHHA 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 Public Health (CDPH) in setting drinking water standards (MCLs) are considered in setting the PHGs. These factors include analytical detection capability, treatment technology availability, 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.

PHG reports are unique to California. They are required in addition to the extensive public reporting of water quality information that California water utilities have been doing for many years and in addition to the federally mandated annual Consumer Confidence Reports/Water Quality Reports. Hence, it should be kept in mind that in addition to this report, the SqCWD will continue to be reporting annually in greater depth on water quality in the system.

The purpose of the legislative requirement is to give water system customers access to information on levels of contaminants even below the enforceable mandatory MCLs. 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.
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 nor MCLG has yet been adopted by OEHHA or USEPA, including Total Trihalomethanes. These will be addressed in a future required report after these PHGs have been adopted.

Detected Compounds

All of the water quality data collected by our water system in the years 2007 through 2009 was considered. This data was summarized in our 2007, 2008 and 2009 Annual Water Quality Reports which were mailed to all of our customers during May/June of those years.

The following section is a discussion of constituents with primary MCLs that were detected at or above the applicable California detection limit for purposes of reporting (DLR) in one or more of our drinking water sources and/or in our distribution system, at levels above the PHG, or if no PHG exists, above the MCLG. The table below summarizes these constituents.

Compound	Health Risk Category	PHG (MCLG	Cancer Risk at PHG	MCL	Cancer Risk at MCL	SqCWD Maximum Level	Best Available Technology (BAT)	Potential Treatment Cost
Total Coliform Bacteria	N/A	(0)	N/A	5% in any month	N/A	6.3%	(a) Protection of wells by appropriate placement & construction; (b) maintenance of a disinfectant residual throughout the distribution system; (c) proper maintenance of the distribution system; and (d) disinfection of groundwater.	N/A – Already implementing
Arsenic	Carcino-genic	0.004 µg/L (ppb)	One per million	10 µg/L (ppb)	2.5 per thousa nd	3.4 µg/L (ppb)	Activated alumina; coagulation/filtr ation; ion exchange; lime softening; reverse osmosis; electrodialysis; and oxidation/ filtration	Already implementing oxidation and filtration; $45 to $230/year per service connection for RO
Copper	Acute toxicity (gastroin testinal effects in children)	0.3 mg/L (ppm)	N/A	1.3 mg/L (action level)	N/A	0.45 mg/L (ppm)	Optimized corrosion control	N/A - Already meeting requirement

Total Coliform Bacteria
In each of the months of March 2007, July 2008, August 2008 and September 2009, we collected 67 samples from our distribution system for total coliform bacteria analysis. Of these samples, 1.5% were positive for coliform bacteria during these months. In October 2009, five of 79 samples, or 6.3%, were positive for coliform bacteria. In the remaining months, 64-80 samples were collected with 0% positives.

Whenever we detect coliform bacteria in any sample, we immediately do follow-up testing to see if other bacteria of greater concern, such as fecal coliform or E. coli, are present. We did not find any of these bacteria in our subsequent testing.

The MCL for coliform is 5.0% positive samples of all samples per month and the MCLG is zero. The reason for the coliform drinking water standard is to minimize the possibility of the water containing pathogens (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 (ACWA, 2010).

Coliform bacteria are indicator organisms 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, it indicates a potential problem that needs to be investigated and follow-up sampling performed. It is not at all 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.

We add chlorine at our sources to assure that the water served is microbiologically safe. The chlorine residual levels are carefully controlled to provide the best health protection without causing the water to have undesirable taste and odor or increasing the disinfection byproduct levels. This careful balance of treatment processes is essential to continue supplying our customers with safe drinking water.

Other equally important measures that we have implemented include: an effective cross-connection control program, maintenance of a disinfectant residual throughout our system, an effective monitoring and surveillance program and maintaining positive pressures in our distribution system. Our system has already taken all of the steps described by CDPH as "best available technology" for coliform bacteria in 22CCR§64447.

Arsenic
The PHG for arsenic is 0.004 µg/L (parts per billion). The MCL for arsenic is 10 µg/L. With the arsenic PHG set at 0.004 µg/L, the CDPH may enact a lower MCL for California in the future. The maximum reported arsenic concentration in SqCWD water from 2007 through 2009 was 3.4 µg/L.

Arsenic is a naturally occurring element in the earth's crust and is widely distributed in the environment. Humans are exposed to arsenic mostly through food, and to a lesser degree from drinking water and air (OEHHA, 2004).

The category of health risk associated with arsenic is that long-term exposure to arsenic in drinking water can increase the risk of skin, lung, bladder and kidney cancer, as well as other skin changes, such as hyperkeratosis and pigmentation changes (World Health Organization, 2008). Other serious health effects stemming from long-term ingestion of arsenic in drinking water include heart attacks, stroke, diabetes and hypertension (OEHHA, 2004). The numerical health risk for the PHG of 0.004 µg/L is one excess cancer case per million people. The numerical health risk for the MCL of 10 µg/L is 2.5 excess cancer cases per thousand people (ACWA 2010).

SqCWD's water meets all federal and state water quality standards for the presence of arsenic. Three of SqCWD's 16 active wells have had arsenic detected above the DLR of 2.0 µg/L, and above the PHG. Although not required by the CDPH, SqCWD voluntarily operates arsenic removal plants for these three wells. The arsenic is removed by oxidation and filtration. The treatment removes 45-50% of the arsenic, reducing the concentrations to below the DLR.

Both the USEPA and CDPH adopt what are known as BATs or Best Available Technologies, which are the best known methods of reducing constituent levels to the MCL. Costs can be estimated for such technologies. However, since many PHGs (and MCLGs) are set much lower than the MCL, such as for arsenic, it is not always possible nor feasible to determine what treatment is needed to further reduce a constituent downward to or near the PHG. Estimating the costs to reduce a constituent to such a low level is difficult, if not impossible, because it is not possible to verify by analytical means that the level has been decreased to that low level. For example, the arsenic PHG is 0.004 µg/L, and the California DLR is 2.0 µg/L, 500 times higher than the PHG. The PHG level cannot be measured by the practically available analytical methods (Eaton, 2010).

There may not be commercially available technology to reduce arsenic concentrations to the PHG. However, reverse osmosis (RO) would likely reduce the arsenic concentrations in SqCWD water lower than that of our existing oxidation/filtration treatment plants.
Accurate cost estimates are difficult, if not impossible, to calculate and are highly speculative and theoretical. All costs including annualized capital, construction, engineering, planning, environmental, contingency and operations and maintenance costs are included but very general assumptions can be made for most of these items.

Cost estimating guides from ACWA (2010) were used in determining the estimated cost to implement RO. The SqCWD's total treatment capacity at the two locations (for three wells) where arsenic would be treated is approximately 1.6 million gallons per day. The estimated cost to install and operate RO treatment systems at these two treatment plants would cost from approximately $630,000 to $3,200,000 per year for the life of the systems. SqCWD has approximately 14,000 service connections. The cost per service connection would range from $45 to $230 per year. There would be additional costs for corrosion control because water treated by RO is corrosive and could cause the water to exceed lead and copper regulations (see below).

Copper
There is no MCL for copper. Instead the 90th percentile value of all samples from household taps in the distribution system cannot exceed a California Action Level of 1.3 mg/l for copper. The PHG for copper is 0.30 mg/l.

Copper is a naturally occurring element and is an essential nutrient in humans. The category of health risk for copper is acute toxicity - gastrointestinal irritation (ACWA, 2010). Copper has not been shown to be carcinogenic in animals or humans (ATSDR, 2004). However, children may be especially susceptible to the effects of excess copper. Numerical health risk data on copper has not yet been provided by OEHHA, the State agency responsible for providing that information (ACWA, 2010).

Copper was not detected in any of our source water samples collected from 2007 through 2009 above the DLR. Based on sampling of our distribution system in 2007, our 90th percentile value for copper was 0.45 mg/l (parts per million), above the PHG of 0.30 mg/L. However, our water system is in full compliance with the federal and state Lead and Copper Rule. Therefore, we are deemed by CDPH 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 copper findings. We continue to monitor our water quality parameters that relate to corrosivity, such as the pH, hardness, alkalinity, and total dissolved solids, and will take action if necessary to maintain our system in an "optimized corrosion control" condition.

Since we are meeting the "optimized corrosion control" requirements, it is not prudent to initiate additional corrosion control treatment as it involves the addition of other chemicals and there could be additional water quality issues raised. Therefore, no estimate of cost has been included.

Recommendations For Further Action
Except for total coliform bacteria in October 2009, the drinking water quality of the SqCWD meets all CDPH 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 MCLs established to provide "safe drinking water" additional costly treatment processes would be required. 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.

List of Acronyms

ACWA	Association of California Water Agencies
ATSDR	Agency for Toxic Substances and Disease Registry
BAT	Best Available Technologies
CDPH	California Department of Public Health
DLR	California Detection Limit for Purposes of Reporting
EPA	Environmental Protection Agency

List of Acronyms (cont'd)

MCL	California Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
mg/L	milligrams per liter, or parts per million
OEHHA	California EPA Office of Environmental Health Hazard Assessment
PHG	California Public Health Goal
RO	Reverse Osmosis
SqCWD	Soquel Creek Water District
µg/L	micrograms per liter, or parts per billion

References

Agency for Toxic Substances and Disease Registry, September 2004, Public Health Statement for Copper.

ACWA, March 2010, Suggested Guidelines for Preparation of Required Reports on Public Health Goals (PHGs) to Satisfy Requirements of California Health and Safety Code Section 116470(b).

Eaton, Andrew, May 24, 2010, Technical Director of MWH Laboratories, personal communication.

OEHHA, April 2004, Public Health Goal for Arsenic in Drinking Water.

World Health Organization, 2008, Guidelines for Drinking-Water Quality, third edition.

NOTE: This publication is meant to be an aid to the staff of the CDHS Drinking Water Program and cannot be relied upon by the regulated community as the State of California's representation of the law. The published codes are the only official representation of the law. Refer to the published codes whenever specific citations are required.

Health and Safety Code §116470

(a) As a condition of its operating permit, every public water system shall annually prepare a consumer confidence report and mail or deliver a copy of that report to each customer, other than an occupant, as defined in Section 799.28 of the Civil Code, of a recreational vehicle park. A public water system in a recreational vehicle park with occupants as defined in Section 799.28 of the Civil Code shall prominently display on a bulletin board at the entrance to or in the office of the park, and make available upon request, a copy of the report. The report shall include all of the following information:

(1) The source of the water purveyed by the public water system.

(2) A brief and plainly worded definition of the terms "maximum contaminant level," "primary drinking water standard," and "public health goal."

(3) If any regulated contaminant is detected in public drinking water supplied by the system during the past year, the report shall include all of the following information:

(A) The level of the contaminant found in the drinking water, and the corresponding public health goal and primary drinking water standard for that contaminant.

(B) Any violations of the primary drinking water standard that have occurred as a result of the presence of the contaminant in the drinking water and a brief and plainly worded statement of health concerns that resulted in the regulation of that contaminant.

(C) The public water system's address and phone number to enable customers to obtain further information concerning contaminants and potential health effects.

(4) Information on the levels of unregulated contaminants, if any, for which monitoring is required pursuant to state or federal law or regulation.

(5) Disclosure of any variances or exemptions from primary drinking water standards granted to the system and the basis therefor.

(b) On or before July 1, 1998, and every three years thereafter, public water systems serving more than 10,000 service connections that detect one or more contaminants in drinking water that exceed the applicable public health goal, shall prepare a brief written report in plain language that does all of the following:

(1) Identifies each contaminant detected in drinking water that exceeds the applicable public health goal.

(2) Discloses the numerical public health risk, determined by the office, associated with the maximum contaminant level for each contaminant identified in paragraph (1) and the numerical public health risk determined by the office associated with the public health goal for that contaminant.

(3) Identifies the category of risk to public health, including, but not limited to, carcinogenic, mutagenic, teratogenic, and acute toxicity, associated with exposure to the contaminant in drinking water, and includes a brief plainly worded description of these terms.

(4) Describes the best available technology, if any is then available on a commercial basis, to remove the contaminant or reduce the concentration of the contaminant. The public water system may, solely at its own discretion, briefly describe actions that have been taken on its own, or by other entities, to prevent the introduction of the contaminant into drinking water supplies.

(5) Estimates the aggregate cost and the cost per customer of utilizing the technology described in paragraph (4), if any, to reduce the concentration of that contaminant in drinking water to a level at or below the public health goal.

(6) Briefly describes what action, if any, the local water purveyor intends to take to reduce the concentration of the contaminant in public drinking water supplies and the basis for that decision.

(c) Public water systems required to prepare a report pursuant to subdivision (b) shall hold a public hearing for the purpose of accepting and responding to public comment on the report. Public water systems may hold the public hearing as part of any regularly scheduled meeting.

(d) The department shall not require a public water system to take any action to reduce or eliminate any exceedance of a public health goal.

(e) Enforcement of this section does not require the department to amend a public water system's operating permit.

(f) Pending adoption of a public health goal by the Office of Environmental Health Hazard Assessment pursuant to subdivision (c) of Section 116365, and in lieu thereof, public water systems shall use the national maximum contaminant level goal adopted by the United States Environmental Protection Agency for the corresponding contaminant for purposes of complying with the notice and hearing requirements of this section.

(g) This section is intended to provide an alternative form for the federally required consumer confidence report as authorized by 42 U.S.C. Section 300g-3(c).

ATTACHMENT NO. 3

COST ESTIMATES FOR TREATMENT TECHNOLOGIES

(INCLUDES ANNUALIZED CAPITAL AND O&M COSTS)

No.	Treatment Technology	Source of Information	Estimated 2007* Unit Cost ($/1,000 gallons treated)
1	Granular Activated Carbon	Reference: Malcolm Pirnie estimate for California Urban Water Agencies, large surface water treatment plants treating water from the State Water Project to meet Stage 2 D/DB and bromate regulation, 1998	0.46 - 0.8784
2	Granular Activated Carbon	Reference: Carollo Engineers, estimate for VOC treatment (PCE), 95% removal of PCE, Oct. 1994,1900 gpm design capacity	0.21
3	Granular Activated Carbon	Reference: Carollo Engineers, est. for a large No. Calif. surf. water treatment plant (90 mgd capacity) treating water from the State Water Project, to reduce THM precursors, ENR construction cost index = 6262 (San Francisco area) - 1992	1.017
4	Granular Activated Carbon	Reference: CH2M Hill study on San Gabriel Basin, for 135 mgd central treatment facility for VOC and SOC removal by GAC, 1990	0.394 - 0.5783
5	Granular Activated Carbon	Reference: Southern California Water Co. - actual data for "rented" GAC to remove VOCs (1,1-DCE), 1.5 mgd capacity facility, 1998	1.823
6	Granular Activated Carbon	Reference: Southern California Water Co. - actual data for permanent GAC to remove VOCs (TCE), 2.16 mgd plant capacity, 1998	1.178
7	Reverse Osmosis	Reference: Malcolm Pirnie estimate for California Urban Water Agencies, large surface water treatment plants treating water from the State Water Project to meet Stage 2 D/DB and bromate regulation, 1998	1.367 -2.616
8	Reverse Osmosis	Reference: Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 1.0 mgd plant operated at 40% of design flow, high brine line cost, May 1991	3.224
9	Reverse Osmosis	Reference: Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 1.0 mgd plant operated at 100% of design flow, high brine line cost, May 1991	1.984
10	Reverse Osmosis	Reference: Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 10.0 mgd plant operated at 40% of design flow, high brine line cost, May 1991	2.15
11	Reverse Osmosis	Reference: Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 10.0 mgd plant operated at 100% of design flow, high brine line cost, May 1991	1.66
12	Reverse Osmosis	Reference: Arsenic Removal Study, City of Scottsdale, AZ - CH2M Hill, for a 1.0 mgd plant operated at 40% of design capacity, Oct. 1991	5.394
13	Reverse Osmosis	Reference: Arsenic Removal Study, City of Scottsdale, AZ - CH2M Hill, for a 1.0 mgd plant operated at 100% of design capacity, Oct. 1991	3.19
14	Reverse Osmosis	Reference: Arsenic Removal Study, City of Scottsdale, AZ - CH2M Hill, for a 10.0 mgd plant operated at 40% of design capacity, Oct. 1991	2.39
15	Reverse Osmosis	Reference: Arsenic Removal Study, City of Scottsdale, AZ - CH2M Hill, for a 10.0 mgd plant operated at 100% of design capacity, Oct. 1991	1.48
16	Reverse Osmosis	Reference: CH2M Hill study on San Gabriel Basin, for 135 mgd central treatment facility with RO to remove nitrate, 1990	1.485 - 2.616
17	Packed Tower Aeration	Reference: Analysis of Costs for Radon Removal... (AWWARF publication), Kennedy/Jenks, for a 1.4 mgd facility operating at 40% of design capacity, Oct. 1991	0.86
18	Packed Tower Aeration	Reference: Analysis of Costs for Radon Removal... (AWWARF publication), Kennedy/Jenks, for a 14.0 mgd facility operating at 40% of design capacity, Oct. 1991	0.46
19	Packed Tower Aeration	Reference: Carollo Engineers, estimate for VOC treatment (PCE) by packed tower aeration, without off-gas treatment, O&M costs based on operation during 329 days/year at 10% downtime, 16 hr/day air stripping operation, 1900 gpm design capacity, Oct. 1994	0.22

COST ESTIMATES FOR TREATMENT TECHNOLOGIES

(INCLUDES ANNUALIZED CAPITAL AND O&M COSTS)

No.	Treatment Technology	Source of Information	Estimated 2007* Unit Cost ($/1,000 gallons treated)
20	Packed Tower Aeration	Reference: Carollo Engineers, for PCE treatment by Ecolo-Flo Enviro-Tower air strippin without off-gas treatment, O&M costs based on operation during 329 days/year at 10% downtime, 16 hr/day air stripping operation, 1900 gpm design capacity, Oct. 1994	0.24
21	Packed Tower Aeration	Reference: CH2M Hill study on San Gabriel Basin, for 135 mgd central treatment facility packed tower aeration for VOC and radon removal, 1990	0.3680 - 0.6046
22	Advanced Oxidation Processes	Reference: Carollo Engineers, estimate for VOC treatment (PCE) by UV Light, Ozone, Hydrogen Peroxide, O&M costs based on operation during 329 days/year at 10% downtime, 24 hr/day AOP operation, 1900 gpm capacity, Oct. 1994	0.45
23	Ozonation	Reference: Malcolm Pirnie estimate for CUWA, large surface water treatment plants using ozone to treat water from the State Water Project to meet Stage 2 D/DBP and bromate regulation,*Cryptosporidium* inactivation requirements,1998	0.1051 - 0.2080
24	Ion Exchange	Reference: CH2M Hill study on San Gabriel Basin, for 135 mgd central treatment facility ion exchange to remove nitrate, 1990	0.4995 - 0.6441

Note:

*Costs were escalated from date of original estimates to present, where appropriate, using Engineering News Record (ENR) construction indices for Los Angeles and San Francisco.

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