EBMUD

BOARD OF DIRECTORS
EAST BAY MUNICIPAL UTILITY DISTRICT

375 - 11th Street, Oakland, CA 94607 Office of the Secretary: (510) 287-0440

Notice of Time Change

PLANNING COMMITTEE MEETING
8:45 a.m.
Tuesday, April 9, 2019

Notice is hereby given that the Tuesday, April 9, 2019 Planning Committee Meeting of the Board of Directors has been rescheduled from 9:15 a.m. to 8:45 a.m. The meeting will be held in the Training Resource Center of the Administration Building, 375 - 11th Street, Oakland, California.

Dated: April 4, 2019

Rischa S. Cole

Rischa S. Cole
Secretary of the District

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BOARD OF DIRECTORS
EAST BAY MUNICIPAL UTILITY DISTRICT

375 – 11th Street, Oakland, CA 94607 Office of the Secretary: (510) 287-0440

AGENDA

Planning Committee
Tuesday, April 9, 2019
8:45 a.m.
Training Resource Center

(Committee Members: Directors Linney {Chair}, McIntosh and Patterson)

ROLL CALL:

PUBLIC COMMENT: The Board of Directors is limited by State law to providing a brief response, asking questions for clarification, or referring a matter to staff when responding to items that are not listed on the agenda.

DETERMINATION AND DISCUSSION:

1.	Earthquake Preparedness	(Chan)
2.	Water Quality Program Annual Update – 2018	(Briggs)
3.	Regulatory Compliance Semi-Annual Report – September 2018 through March 2019	(Chan)
4.	Advanced Metering Infrastructure Water-Energy Nexus Study Update	(Chan)
5.	South Interceptor 3rd Street Rehabilitation Phase 2 Project	(White)
6.	Annual Recreation Report – 2018	(Tognolini)

ADJOURNMENT:

Disability Notice

If you require a disability-related modification or accommodation to participate in an EBMUD public meeting please call the Office of the Secretary (510) 287-0404. We will make reasonable arrangements to ensure accessibility. Some special equipment arrangements may require 48 hours advance notice.

Document Availability

Materials related to an item on this agenda that have been submitted to the EBMUD Board of Directors within 72 hours prior to this meeting are available for public inspection in EBMUD's Office of the Secretary at 375 11th Street, Oakland, California, during normal business hours, and can be viewed on our website at www.ebmud.com.

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: April 4, 2019

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager ARC

FROM: Clifford C. Chan, Director of Operations and Maintenance CCC

SUBJECT: Earthquake Preparedness

INTRODUCTION

The District maintains an active Emergency Preparedness Program that includes an Emergency Operations Plan (EOP) in accordance with Policy 7.03 – Emergency Preparedness/Business Continuity. The plan guides the District's critical emergency operations to protect people, property, and the environment, and is regularly updated as new information is gathered. This item will be discussed at the April 9, 2019 Planning Committee meeting.

DISCUSSION

The District's Strategic Plan includes a strategy to maintain an active emergency preparedness program to manage the District's functions and allow for efficient and effective recovery following an emergency. Key Performance Indicators in the Strategic Plan (KPIs) include updating the EOP every two years, conducting an annual Emergency Operations Team exercise, updating Business Continuity Plans (BCPs) every two years, conducting annual BCP exercises, and annually reviewing emergency communication plans. These KPIs will be met in Fiscal Year 2019.

The District continues to harden and improve the resiliency of its infrastructure, develop response plans, and conduct exercises to prepare for future earthquakes. In April 2018, the United States Geological Survey (USGS) released the HayWired Report Volume I – Earthquake Hazards and Volume II Engineering Implications. This study focused on the hazards during and after a hypothetical magnitude 7.0 earthquake and damage to buildings, utilities, and other infrastructure. Volume III will be released April 18, 2019 and will discuss the social and economic impacts.

Studies by the District and USGS have found that a large earthquake can cause thousands of main breaks and damage to District facilities, which can disrupt water service for months. Given those results, staff has engaged cities and counties in the service area to plan for disruption of water service following an earthquake. The goals are to support city and county plans to

distribute potable water and provide resources and support until state or federal agencies establish mass care systems and prepare for coordination of water system recovery. This effort will continue in Fiscal Year 2020.

A major earthquake will require significant resources for response and can also reduce the District's resources due to impacts to employees' homes and families. To mitigate these impacts, the District has a mutual assistance agreement in place with the Los Angeles Department of Water and Power and the Las Vegas Valley Water District to obtain resources from those agencies in the event of an emergency. Staff regularly engages mutual assistance partners to ensure those resources will be available when needed. The agencies conducted an emergency preparedness exercise in Los Angeles in August 2018 and will conduct a workshop and tabletop exercise at the District in April 2019.

ARC:CCC:rk

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EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: April 4, 2019

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager ARC

FROM: David A. Briggs, Manager of Water Operations DB

SUBJECT: Water Quality Program Annual Update - 2018

INTRODUCTION

This memo provides an update on the District's water quality and ongoing initiatives to ensure delivery of high quality water to customers. This update summarizes water quality data for calendar year 2018. A presentation on the Water Quality Program will be made at the April 9, 2019 Planning Committee meeting.

SUMMARY

In 2018, the District met all federal and state drinking water standards while meeting 97 percent of the District's internal goals (4 of 125 were not met). Data for this report are reflected in the 2018 Consumer Confidence Report made available to customers in June of each year. Levels of chlorinated disinfection byproducts (DBPs) exceeded District goals but remained below regulatory levels. The District's water quality goals for n-nitrosodimethylamine (NDMA) and filter effluent turbidity were not met. In 2018, there were no major taste and odor events. The District also continued its efforts to minimize potential exposure to customers from lead in water.

DISCUSSION

District Water Quality Goals

The District's internal water quality goals are substantially more stringent than federal or state water quality standards to ensure regulatory compliance and maximize the quality of the District's treated water. In 2018, the District exceeded four of its water quality goals.

Total Trihalomethanes (TTHMs) and five haloacetic acids (HAA5) are regulated DBPs that form when chlorine reacts with natural organic matter in the water. In 2018, the District's goal was exceeded in 40 out of 64 individual TTHM sampling locations and 21 out of 64 HAA5 sampling locations. The District's goals (40 parts per billion (ppb) for TTHMs and 30 ppb for HAA5) are currently set at half of the regulatory standards. Concentrations of DBPs remained relatively steady during 2018, and no individual samples exceeded the regulatory standards. Progress

continues with the upcoming capital projects to modify treatment at the Orinda and Sobrante Water Treatment Plants (WTPs) and improve raw water quality within San Pablo Reservoir. When complete, these projects should result in consistently lower DBP concentrations.

NDMA can also be a DBP as it forms when chloramine reacts with precursor materials in the water. Although not required by law, the District collects quarterly samples at five locations in the distribution system. The District's water quality goal was exceeded in nine of the 20 samples. There is no regulatory standard for NDMA, and the District's goal is set at the same level as the Public Health Goal for this compound.

Post-filter turbidity level is a performance indicator of the filtration process at the water treatment plants. The District has five water quality goals for turbidity; one was not met in 2018. Turbidity is measured in the effluent of each individual filter at each plant every minute. Although regulations allow up to 5 percent of all turbidity measurements to exceed the applicable level, the District's goal is for every reading to be lower than that threshold. In 2018, there were 17 individual turbidity readings above the goal (0.0001 percent of all readings). Each of the exceedances occurred at the Orinda WTP. In each case, operators responded quickly, removed filters from service, and corrected the problem.

Review of Water Quality Goals

As new information becomes available or regulatory requirements change, the District's goals are reviewed and modified as necessary. For example, a new regulatory standard for 1,2,3-Trichloropropane was recently adopted in California, and a goal for this compound was added. Goals are also modified to include water quality issues that were not addressed previously. For example, the current goals do not include specific water quality targets for disinfectant residual in the distribution system. Some pathogens such as *Legionella* bacteria can proliferate in distribution system biofilms that can grow in the absence of a disinfectant residual. The District, through the Water Quality Committee, is reviewing and updating the water quality goals to reflect current understanding of public health concerns and better balance risks. This review is expected to result in several modified goals.

Lead

The District continues its efforts to minimize customer exposure to lead in drinking water through a variety of independent programs. Based on data from the Lead and Copper Rule (LCR) compliance monitoring, the customer sampling voucher program, school sampling, and periodic studies, the District's corrosion control program is effective in minimizing the release of lead from any remaining leaded components. Results of the sample collection are summarized below.

- Samples from customer taps were collected in accordance with the LCR. The 90th percentile lead concentration was 2.3 ppb, far lower than the regulatory Action Level of 15 ppb and the lowest concentration recorded to date. Due to the consistently low readings, the District has received approval for less frequent monitoring.

- The customer sampling voucher program continues to be widely utilized with approximately 650 customers participating to date. The 90th percentile lead concentration from these customer samples continues to be very low (less than 1 ppb).
- Sampling for lead in schools began in 2017 and continued in 2018. All of the mandatory public schools (including preschools and charter schools) have been sampled, well ahead of the regulatory deadline of July 1, 2019. Results were less than 5 ppb in 96 percent of the samples and less than 1 ppb in 80 percent of the samples. District staff contacted schools and followed up on any high results. Under the District's 2017 Domestic Water Supply Permit Amendment from the State Water Resources Control Board's Division of Drinking Water (DDW), private schools can request voluntary lead sampling until November 1, 2019. About 40 percent of eligible private schools have been tested to date, and results have been similar to public schools.
- Previously unidentified lead service laterals are occasionally discovered and immediately replaced with copper. Customer sampling prior to removal generally shows low lead concentrations (below the action level), confirming the effectiveness of the District's corrosion control program. Pursuant to state law, the District will complete its lead component inventory and corresponding abatement plan by July 1, 2020.

Taste and Odor

No major taste and odor incidents occurred in 2018. The ozone facilities at Sobrante and Upper San Leandro WTPs were upgraded last year. Use of ozone is the most effective way to reduce taste and odor causing compounds in treated water. In addition to taste and odor causing compounds, some algae can produce toxins under certain conditions. The District continues its efforts to monitor algal concentrations in raw water reservoirs, and collect and analyze samples for toxins as indicated by the algal results. No toxins have been detected in the District's raw water reservoirs.

Nitrification/Chlorine Residuals

Due to the size, complexity and long residence time of water in the District's distribution system, maintaining a high disinfectant residual in certain parts of the distribution system remains a challenge. The District collects and analyzes water samples throughout the system, and takes immediate action when nitrification and low disinfectant residual are detected. The Partnership for Safe Water recommends a chlorine residual of 0.5 milligrams per liter or greater in at least 95 percent of monthly samples throughout the distribution system. This target was met every month in 2018.

Regulatory Updates

In July 2018, the State Board issued two new Notification Levels (NLs) for Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS). These compounds are ubiquitous in the built environment and are used extensively in consumer products such as carpets, clothing, fabrics for furniture, paper packaging for food, cosmetics, and cookware and give these products

waterproof, stain-resistant or non-stick qualities. In addition, they are used in fire retardant foam and various industrial processes. With the United States Environmental Protection Agency considering regulation of this class of compounds (called per- and poly-fluoroalkyl substances, or PFAS), many states, including California, have acted ahead of any pending federal process. Accordingly, DDW indicated that first stage regulation (monitoring and establishing notification levels) will occur for water systems most likely to be exposed to PFAS, which generally include groundwater systems near airports, fire-fighting training centers, or other commercial operations that typically use PFAS. In addition, DDW is requiring selected airports and landfill operators who use these compounds to submit technical reports and monitoring plans.

The District monitored for these compounds as part of the Unregulated Contaminant Monitoring Rule 3 (UCMR3) in 2014 and did not detect any PFAS. At that time, the minimum detection limits for PFOA and PFOS were 20 parts per trillion (ppt) and 40 ppt, respectively. Since that time, analytical methods have improved and the detection limits are lower. The new NLs for PFOA and PFOS are lower: 14 ppt and 13 ppt, respectively. Due to the protected nature of the District's watersheds, these compounds are not likely to be detected in the District's water supply. DDW has not yet recommended monitoring for surface waters until more data are gathered regarding sampling techniques and analytical methodologies. PFOA and PFOS are not included in UCMR4 which includes sampling for 30 chemical contaminants between 2018 and 2020.

San Joaquin Valley Groundwater

The District continues to pursue a joint use groundwater project with the North San Joaquin Water Conservation District. The pilot scale version of the project will extract groundwater and blend it in the Mokelumne Aqueducts upstream of the District's WTPs. Levels of arsenic in the groundwater are detectable but below the Maximum Contaminant Level (MCL) of 10 ppb. After blending with water in the aqueducts, which have a ratio as little as 40:1, levels are expected to remain well below the MCL but may be detectable and potentially reportable.

ARC:DAB:rk

Attachment

Parameter	Units	MCL	PHG	DLR	SMCL	NL	other	Basis for WQG	Water Quality Goal (WQG)	Status*
USEPA/State Water Quality Regulations										
Primary (Health Standards)										
Inorganic Chemicals										
Aluminum	ug/L	1000	600	50	200			½SMCL	100	Met
Antimony	ug/L	6	20	6				DLR	6	Met
Arsenic	ug/L	10	0.004	2				DLR	2	Met
Asbestos	MFL	7	7	0.2				½MCL	3.5	Met
Barium	ug/L	1000	2000	100				½MCL	500	Met
Beryllium	ug/L	4	1	1				PHG/DLR	1	Met
Cadmium	ug/L	5	0.04	1				DLR	1	Met
Chromium (total)	ug/L	50		10				½MCL	25	Met
Cyanide	mg/L	0.15	0.15	0.1				DLR	0.1	Met
Fluoride (source water)	mg/L	2	1	0.1				PHG	1	Met
Hexavalent chromium	ug/L	10	0.02	1				DLR	1	Met
Mercury	ug/L	2	1.2	1				DLR	1	Met
Nickel	ug/L	100	12	10				PHG	12	Met
Nitrate + Nitrite Total (as N)	mg/L	10	10	0.4				½MCL	5	Met
Nitrate as N [x4.5 for NO3]	mg/L	10	10	0.4				½MCL	5	Met
Nitrite (as N)	mg/L	1	1	0.4				½MCL	0.5	Met
Perchlorate	ug/L	6	1	4				DLR	4	Met
Selenium	ug/L	50	30	5				½MCL	25	Met
Thallium	ug/L	2	0.1	1				DLR	1	Met
Organic Chemicals										
Volatile Organic Compounds (VOCs)										
1,1,1-Trichloroethane (1,1,1-TCA)	ug/L	200	1000	0.5				½MCL	100	Met
1,1,2,2-Tetrachloroethane	ug/L	1	0.1	0.5				DLR	0.5	Met
1,1,2-Trichloroethane (1,1,2-TCA)	ug/L	5	0.3	0.5				DLR	0.5	Met
1,1-Dichloroethane (1,1-DCA)	ug/L	5	3	0.5				½MCL	2.5	Met
1,1-Dichloroethylene (1,1-DCE)	ug/L	6	10	0.5				½MCL	3	Met
1,2,4-Trichlorobenzene	ug/L	5	5	0.5				½MCL	2.5	Met
1,2-Dichlorobenzene (o-DCB)	ug/L	600	600	0.5				½MCL	300	Met
1,2-Dichloroethane (1,2-DCA)	ug/L	0.5	0.4	0.5				DLR	0.5	Met
1,2-Dichloropropane	ug/L	5	0.5	0.5				DLR	0.5	Met
1,3-Dichloropropene (Total)	ug/L	0.5	0.2	0.5				DLR	0.5	Met

Compounds highighted in blue appear more than once in this table.

*Status is either "Met or "Not Met". If goal was not met, number shown is the percent of samples not meeting the goal.

Parameter	Units	MCL	PHG	DLR	SMCL	NL	other	Basis for WQG	Water Quality Goal (WQG)	Status*
1,4-Dichlorobenzene (p-DCB)	ug/L	5	6	0.5				½MCL	2.5	Met
Benzene	ug/L	1	0.15	0.5				DLR	0.5	Met
Carbon Tetrachloride	ug/L	0.5	0.1	0.5				DLR	0.5	Met
Dichloromethane (Methylene Chloride)	ug/L	5	4	0.5				½MCL	2.5	Met
Ethylbenzene	ug/L	300	300	0.5				½MCL	150	Met
Freon 113 (1,1,2 trichloro 1,2,2 trifluoroethane)	ug/L	1200	4000	10				½MCL	600	Met
Methyl-tert-butyl ether (MTBE)	ug/L	13	13	3	5			DLR	3	Met
Monochlorobenzene (Chlorobenzene)	ug/L	70	200	0.5				½MCL	35	Met
Styrene	ug/L	100	0.5	0.5				PHG	0.5	Met
Tetrachloroethylene	ug/L	5	0.06	0.5				DLR	0.5	Met
Toluene	ug/L	150	150	0.5				½MCL	75	Met
Trichloroethylene (TCE)	ug/L	5	1.7	0.5				PHG	1.7	Met
Trichlorofluoromethane (Freon 11)	ug/L	150	700	5				½MCL	75	Met
Vinyl Chloride (VC)	ug/L	0.5	0.05	0.5				DLR	0.5	Met
Xylenes (Total)	ug/L	1750	1800	1				½MCL	875	Met
cis-1,2-Dichlorethylene (c-1,2-DCE)	ug/L	6	100	0.5				½MCL	3	Met
trans-1,2-Dichloroethylene (t-1,2-DCE)	ug/L	10	60	0.5				½MCL	5	Met
Synthetic Organic Compounds (SOCs)										
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2	0.002	0.01				DLR	0.01	Met
2,3,7,8-TCDD (Dioxin)	pg/L	30	0.05	5				DLR	5	Met
2,4,5-TP (Silvex)	ug/L	50	25	1				PHG	25	Met
2,4-D	ug/L	70	20	10				PHG	20	Met
Alachlor (Alanex)	ug/L	2	4	1				DLR	1	Met
Atrazine (Aatrex)	ug/L	1	0.15	0.5				DLR	0.5	Met
Bentazon (Basagran)	ug/L	18	200	2				½MCL	9	Met
Benzo(a)pyrene	ug/L	0.2	0.007	0.1				DLR	0.1	Met
Bis(2-ethylhexyl)phthalate (DEHP)	ug/L	4	12	3				DLR	3	Met
Carbofuran	ug/L	18	1.7	5				DLR	5	Met
Chlordane	ug/L	0.1	0.03	0.1				DLR	0.1	Met
Dalapon	ug/L	200	790	10				½MCL	100	Met
Di(2-ethylhexyl)adipate	ug/L	400	200	5				½MCL	200	Met
Dinoseb (DNBP)	ug/L	7	14	2				½MCL	3.5	Met
Diquat	ug/L	20	15	4				½MCL	10	Met

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Parameter	Units	MCL	PHG	DLR	SMCL	NL	other	Basis for WQG	Water Quality Goal (WQG)	Status*
Endothall	ug/L	100	580	45				½MCL	50	Met
Endrin	ug/L	2	1.8	0.1				½MCL	1	Met
Ethylene dibromide (EDB)	ug/L	0.05	0.01	0.02				DLR	0.02	Met
Glyphosate	ug/L	700	900	25				½MCL	350	Met
Heptachlor	ug/L	0.01	0.008	0.01				DLR	0.01	Met
Heptachlor Epoxide	ug/L	0.01	0.006	0.01				DLR	0.01	Met
Hexachlorobenzene	ug/L	1	0.03	0.5				DLR	0.5	Met
Hexachlorocyclopentadiene	ug/L	50	50	1				½MCL	25	Met
Lindane (Gamma BHC)	ug/L	0.2	0.032	0.2				DLR	0.2	Met
Methoxychlor	ug/L	30	0.09	10				DLR	10	Met
Molinate	ug/L	20	1	2				DLR	2	Met
Oxamyl (Vydate)	ug/L	50	26	20				½MCL	25	Met
PCB's	ug/L	0.5	0.09	0.5				DLR	0.5	Met
Pentachlorophenol (PCP)	ug/L	1	0.3	0.2				PHG	0.3	Met
Picloram	ug/L	500	500	1				½MCL	250	Met
Simazine	ug/L	4	4	1				½MCL	2	Met
Thiobencarb	ug/L	70	70	1	1			DLR	1	Met
Toxaphene	ug/L	3	0.03	1				DLR	1	Met
1,2,3-Trichloropropane	ug/L	0.005	0.0007	0.005				DLR	0.005	Met
Disinfection By-Products (DBPs)										
Bromate	ug/L	10	0.1	1				½MCL	5	Met
Chlorite	ug/L	1000	50	20				PHG	50	Met
Haloacetic Acids (HAA)	ug/L	60		1				½MCL	30	33%
Total Trihalomethanes (TTHM)	ug/L	80		0.5				½MCL	40	62%
Radionuclides										
Alpha	pCi/L	15		3				½MCL	7.5	Met
Beta	pCi/L			4			50	½ other[1]	25	Met
Radium 226 + 228	pCi/L	5	0.019	1				½MCL	2.5	Met
Strontium-90	pCi/L	8	0.35	2				DLR	2	Met
Tritium	pCi/L	20000	400	1000				DLR	1000	Met
Uranium	pCi/L	20	0.43	1				DLR	1	Met
Microbiological										
%Total Coliforms Positive/Mo.	Organisms/100 ml	5%						other[2]	0.5%	Met
Treatment Techniques										
Individual Filter Effluent (IFE) Turbidity	NTU						< 0.10 NTU more than 95% of the time.	Exceed Partnership for Safe Water[5]	< 0.10 NTU more than 99.9% of the time	Met

Compounds highighted in blue appear more than once in this table.

*Status is either "Met or "Not Met". If goal was not met, number shown is the percent of samples not meeting the goal.

Parameter	Units	MCL	PHG	DLR	SMCL	NL	other	Basis for WQG	Water Quality Goal (WQG)	Status*
Individual Filter Effluent (IFE) Turbidity	NTU							Exceed Partnership for Safe Water[5]	Max value 0.2 NTU for inline, 0.3 NTU for others	0.00011%
Filter Startup Turbidity	NTU						Max individual backwash recovery period[3] of 15 minutes.	Partnership for Safe Water	Max individual backwash recovery period[3] of 15 minutes.	Met
Combined Filter Effluent (CFE) Turbidity	NTU							Exceed Partnership for Safe Water[5]	< 0.10 NTU more than 99.9% of the time.	Met
Combined Filter Effluent (CFE) Turbidity	NTU						CaSWTR[4]	Exceed Partnership for Safe Water[5]	Max value 0.2 NTU for inline, 0.3 NTU for others	Met
Fluoride added at WTP Effluent	mg/L							other[6]	0.6-1.2	Met
CT Ratio							1	other[7]	>1	Met
SUVA	L/mg-m						2	other[8]	1.8	Met
Lead 90th percentile	ug/L		0.2	5			15	½ AL[9]	7.5	Met
Copper 90th percentile	ug/L		300	50			1300	½ AL[10]	650	Met
Acrylamide							0.05% monomer by wt. dose not to exceed 1 mg/L	other[11]	0.05% monomer by wt. dose not to exceed 1 mg/L	Met
Secondary (Aesthetic) Standards										
Aluminum	ug/L	1000	600	50	200			½SMCL	100	Met
Chloride	mg/L				250			½SMCL	125	Met
Color	color unit				15			½SMCL	7.5	Met
Copper	ug/L		300	50	1000			PHG	300	Met
Foaming agents (MBAS)	ug/L				500			½SMCL	250	Met

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Parameter	Units	MCL	PHG	DLR	SMCL	NL	other	Basis for WQG	Water Quality Goal (WQG)	Status*
Iron	ug/L				300		100	other[12]	100	Met
Manganese	ug/L				50	500	15	other[13]	15	Met
Methyl tertiary butyl ether (MTBE)	ug/L	13	13	3	5			DLR	3	Met
Odor threshold	TON				3			SMCL	3	Met
Silver	ug/L				100			½SMCL	50	Met
Specific Conductance	uS/cm				900			½SMCL	450	Met
Sulfate	mg/L				250			½SMCL	125	Met
Thiobencarb	ug/L	70	70	1	1			DLR	1	Met
Total Dissolved Solids	mg/L				500			½SMCL	250	Met
Turbidity (distribution)	NTU				5			½SMCL	2.5	Met
Zinc	ug/L				5000			½SMCL	2500	Met
Customer Expectations										
District-caused complaints	Com-plaints/ month						30	other[14]	30	Met
Emerging Contaminants										
Inorganic Chemicals										
Boron	ug/L			100		1000		½NL	500	Met
Chlorate	ug/L					800		½NL	400	Met
Organic Chemicals										
1,2,4-Trimethylbenzene	ug/L					330		½NL	165	Met
1,3,5-Trimethylbenzene	ug/L					330		½NL	165	Met
N-Nitrosodi-methylamine [NDMA]	ng/L		3			10		PHG	3	37%
N-Nitrosodiethylamine [NDEA]	ng/L					10		½NL	5	Met
Naphthalene	ug/L					17		½NL	8.5	Met

[1] ½ screening level
[2] 1/10th 5% MCL
[3] Backwash recovery period is the time the turbidity is ≥ 0.10 NTU after a filter is placed in operation following a backwash or filtering to waste.
[4] California Surface Water Treatment Rule (SWTR); combined filter effluent turbidity < 0.3 NTU 95% for conventional plants and 0.2 NTU for in-line filtration plants more than 95% of the time.
[5] <0.10 NTU 95 percent of the time.
[6] Optimal Fluoride Dose (0.7 mg/L) per 2015 US Public Health Service recommendation
[7] CT ratio of 1 is the minimum for compliance; goal is be greater than or equal to 1 at all times.
[8] Based on operational experience
[9] ½ Action Level
[10] ½ Action Level; compliance based on in-home samples.
[11] USEPA Treatment Technique
[12] Operational experience
[13] Operational experience
[14] Based on historical data

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EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: April 4, 2019

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager ARC

FROM: Clifford C. Chan, Director of Operations and Maintenance CCC

SUBJECT: Regulatory Compliance Semi-Annual Report – September 2018 through March 2019

INTRODUCTION

This memorandum summarizes the key regulatory issues and compliance activities since the last Regulatory Compliance Semi-Annual Report on September 11, 2018. A presentation updating the status of regulatory compliance issues will be provided at the April 9, 2019 Planning Committee meeting.

DISCUSSION

An overview of the major regulatory issues and activities during the reporting period follows. Specific details and activities are contained in the attached report.

Environmental Compliance

The District accepted two minor settlements for air permit violations related to gasoline dispensing facility hoses. On October 11, 2018, the District accepted a $500 settlement from the Bay Area Air Quality Management District (BAAQMD) for a torn vapor recovery hose found at the Main Wastewater Treatment Plant (MWWTP). On November 27, 2018, the District accepted a settlement of $300 from the San Joaquin Valley Air Pollution Control District to settle a violation related to Enhanced Vapor Recovery requirements.

In January 2019, the District conducted four public meetings in Stockton, Walnut Creek, Oakland, and Valley Springs to present details of the District's Integrated Pest Management (IPM) program. The meetings provided an opportunity for the public to learn about recent enhancements to the IPM program and provide feedback on the efforts to date.

On January 31, 2019, the MWWTP reported a digester gas venting incident to BAAQMD and requested breakdown relief for the incident. The venting incident was caused by the sudden

failure of a programmable logic controller that regulated several critical controls in the digester gas system. If BAAQMD determines that breakdown relief is granted, no violation will be issued.

On February 13, 2019, the San Antonio Creek Wet Weather Facility experienced a pH exceedance in the discharge when operating during wet weather. The measured pH of 6.2 was outside of the permitted pH levels of 6.5-8.5 in the Consent Decree.

On March 1, 2019, the District met with the San Francisco Regional Water Quality Control Board (SF RWQCB) to discuss adverse impacts from potable water discharge related to a main break that resulted in a fish kill in the San Ramon Creek in the Town of Danville. The District is in the process of preparing a comprehensive report at the request of the SF RWQCB that describes the details of the District's water main maintenance and rehabilitation initiatives and incident response field protocols.

Workplace Health and Safety

On February 14, 2019, the District received a Complaint Notice from Cal OSHA. The complaint alleged a violation of the Injury and Illness Prevention Plan in the Meter Reading and Maintenance section. The District responded to Cal OSHA on February 22, 2019.

The Strategic Plan Workforce Planning and Development goal includes a KPI for Lost Time Injury Rate (LTIR) to be less than or equal to 3.0. The current LTIR through February 2019 is 1.89.

ARC:DMW:rk

Attachment

REGULATORY COMPLIANCE SEMI-ANNUAL REPORT
September 2018 through March 2019

This report provides the status of the District's efforts to meet the objectives of and comply with environmental, health, and safety regulations in accordance with District Policies 7.05 – Sustainability and 7.09 – Workplace Health and Safety.

NPDES AND WATER DISCHARGE REQUIREMENTS PERMIT ISSUES

Wet Weather Facilities (WWF): On February 13, 2019, the San Antonio Creek WWF experienced a pH exceedance in the discharge when operating during wet weather. The measured pH of 6.2 was outside of the permitted pH levels of 6.5-8.5 in the Consent Decree. The San Antonio Creek WWF controls pH in the effluent by using sodium hydroxide which is blended with the sodium hypochlorite used for disinfection. The District is planning on purchasing sodium hypochlorite with a higher concentration of sodium hydroxide in the mixture to help prevent a reoccurrence of a pH exceedance at the facility.

Orinda Water Treatment Plant (OrWTP): On September 6, 2017, the District reported to the San Francisco Regional Water Quality Control Board (SF RWQCB) an exceedance of the limit for residual chlorine in the filter backwash discharge at the OrWTP. Approximately 230,000 gallons of water containing 0.22 mg/L of chlorine or less was discharged to San Pablo Creek (the permit limit is less than 0.1 mg/L total chlorine residual). The District met with the SF RWQCB on January 26, 2018 and again on May 7, 2018 to present the findings as well as corrective actions. The settlement agreement for this incident is anticipated to be finalized in the near future.

Upcountry Wastewater Treatment Plants (WWTPs): The District is operating under expired, but extended, Waste Discharge Requirements (WDR) at Camanche North Shore (CANS) and Camanche South Shore (CASS). As of October 4, 2018 and April 6, 2018, respectively, Pardee Recreation Area and Pardee Center are now regulated through the State Water Resources Control Board's (SWRCB) General Order 2014-0153-DWQ. The District anticipates the Central Valley (CV) RWQCB will require a Report of Waste Discharge for CANS WWTP and CASS WWTP in the future which would be the first step in obtaining coverage under the new General Order.

CASS: On August 31, 2018, the District submitted an agreed upon memorandum to the CV RWQCB. The memorandum confirmed that the background groundwater monitoring well (MW 11) was adequate given the geographic constraints of the site. The memorandum recommended use of the WWTP effluent data instead of MW 11 data to compare with District-collected groundwater quality data for compliance assessment purposes. The CV RWQCB has not yet responded to the memorandum.

In January 2019, the District monitored the two local surface water ponds, two wastewater ponds, and groundwater wells, including MW 11, for specific wastewater markers. The findings will be included in the next regularly scheduled report to the CVRWQCB.

On September 27, 2018, the District submitted an agreed upon technical report (Report) regarding the adjacent closed District-owned landfill to the CV RWQCB. The Report stated that

the assessment of the landfill cap showed that its integrity is intact. There is no leachate from the landfill impacting the underlying groundwater table. The CV RWQCB has not yet responded to the Report.

CANS: The CV RWQCB has not yet responded to the District's May 4, 2018 updated groundwater monitoring well work plan. Consequently, the new groundwater wells cannot be installed until approval of the work plan is received from the CV RWQCB.

Enhanced Compliance Action (ECA) Quarterly Reports: The District agreed to complete an ECA as part of the final settlement agreement related to three water main breaks in late 2015 and early 2016. The ECA involves installation of leak detection loggers at locations where pipes cross or are installed adjacent to creeks. To date 69 leaks have been addressed that otherwise would not have been detected. The ECA requires the District to install approximately 970 leak detection loggers and submit quarterly reports on implementation progress. The most recent quarterly report was submitted on March 31, 2019.

AIR PERMIT COMPLIANCE

Main Wastewater Treatment Plant (MWWTP) – Title V Permit and Permit to Operate: The District accepted a $500 settlement offer from the Bay Area Air Quality Management District (BAAQMD) in October 2018 for a torn vapor balance hose discovered on one of the gasoline dispensers on July 12, 2018. The hose was promptly replaced and no further corrective actions are necessary.

The District reported a digester gas venting incident to BAAQMD on January 31, 2019 and requested breakdown relief for the incident. Approximately 135,000 cubic feet of unabated digester gas vented from the low pressure gas holder after the sudden failure of a programmable logic controller (PLC) that regulated several critical controls in the digester gas system. The District has replaced the PLC that failed and is in the process of procuring new equipment which will allow a redundant PLC to be placed in the control system to take over if another failure occurs. If BAAQMD determines that breakdown relief is granted, no violation will be issued. However, BAAQMD stated that granting relief from violations due to equipment breakdowns is not encouraged by the U.S. Environmental Protection Agency, so this type of relief may not be available in the future.

Stockton Fueling Facility: On September 18, 2018, the San Joaquin Valley Air Pollution Control District (SJVAPCD) conducted an inspection and found a violation for using incorrect hoses for the fuel dispensing system. The violation was corrected by District staff on the same day of the inspection. On November 27, 2018, the District accepted a settlement of $300.

OTHER ENVIRONMENTAL ISSUES

Richmond Advanced Recycled Expansion (RARE) pH Violations: Construction of a pH neutralization system at RARE is underway to address pH violations from September 2017. RARE has been operating under a compliance agreement with West County Wastewater District (WCWD) since January 2018 while the neutralization system was being built. A neutralization

skid has been delivered to the site and is anticipated to be in service by April 30, 2019. At that time, RARE will be expected to comply with updated pH limits from WCWD which require continual compliance with pH limits of 6.0-12.0.

Integrated Pest Management (IPM) Program: The District hosted its second annual comprehensive IPM training in March 2019 for all employees with pest management responsibilities, designed a public-facing IPM brochure for field staff to share when public inquiries are made, updated the IPM webpage and established an IPM email for the public to make direct inquiries about the program. The District also developed and finalized data tracking tools to account for IPM practices. An update on the IPM Program was provided to the Planning Committee in January 2019.

Anderson Building former Underground Storage Tank (UST) investigation: A UST was removed from the Anderson Building site located at the Adeline Maintenance Center (AMC) Administration building property in 1987. The Alameda County Department of Environmental Health (ACDEH) recently requested the District collect soil and groundwater samples at the site in order to evaluate current conditions. Sampling of subsurface soil and groundwater in the vicinity of the former tank in late 2018 indicated relatively low levels of residual hydrocarbon contamination in the soil and a plume of hydrocarbons in the shallow groundwater. A data gap exists at the site, which prompted the ACDEH to request the District to determine the extent of the hydrocarbon plume in the groundwater. The District has been tasked with the sampling and is in the permitting process at this time.

AMC Shops UST Investigation: ACDEH requested additional maps and data tables for the entire AMC campus to better understand current conditions and facility uses on the various properties. Several underground fuel and waste oil tanks were removed from the site in the mid-1980s and some environmental data has been collected. ACDEH is considering the site under the State's Low Threat Closure Policy, but needs certain data gaps filled prior to either requesting additional sampling or providing regulatory closure. Staff is working to produce the maps and data tables. No sampling or field work has been requested by ACDEH at this time.

District Owned Disposal Sites: The District stockpiles clean trench soil material at three permitted sites in the service area. Staff oversees pre-wet season inspections and reinforcement of existing Best Management Practices (BMPs) to control sediment and erosion. One site near Briones Reservoir posed a challenge given the amount of soils. Additional measures were incorporated to provide protection during the wet season. All three sites are scheduled for off haul to landfill or beneficial reuse. As of November 5, 2018, the District removed approximately 289,791 cubic yards (CY) from the Briones disposal site. The completion of all off-haul activities included final grading and installation of BMPs. This portion of the soil off-haul contract work was completed during November 2018.

Preparations for off haul at Miller Road and Amador disposal sites began in January 2019. Work is currently scheduled as follows:

- Miller Road– Removal of 75,000 CY – April to June 2019
- Amador – Removal of 25,000 CY – June to September 2019

WORKPLACE HEALTH AND SAFETY

The Strategic Plan Workforce Planning and Development goal includes a KPI for Lost Time Injury Rate (LTIR) to be less than or equal to 3.0. The District's rolling 12 month LTIR as of February 2019 is 1.89, significantly below the KPI of 3.0. The LTIR measures the number of work-related injuries or illnesses resulting in days away from work per 100 employees.

The number of lost time hours due to an injury or illness has been reduced by approximately 60 percent over the last eight years from 35,282 hours in 2010 to 13,877 hours in 2018. This is a reduction of 21,405 hours; the equivalent of approximately 12 full-time employees. The District continues to focus on preventing injuries by utilizing leading indicators such as supervisor presence in the field, number of local safety committee meetings held, safety training hours completed, injury investigation reports completed, and presenting lost time injury investigation results at management staff meetings.

On February 14, 2019, the District received a Complaint Notice from Cal OSHA. The complaint alleged a violation of Title 8 California Code of Regulations §3203 – Injury and Illness Prevention Plan. The complaint appears to have come from the Meter Reading and Maintenance section alleging injuries due to the long duration, intensity, and repetitive nature of reading and servicing water meters. The District responded to Cal OSHA on February 22, 2019. Cal OSHA will either accept the response and close the complaint, or perform an inspection.

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: April 4, 2019

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager ARC

FROM: Clifford C. Chan, Director of Operations and Maintenance CCC

SUBJECT: Advanced Metering Infrastructure Water-Energy Nexus Study Update

INTRODUCTION

The District's current Advanced Metering Infrastructure (AMI) project, also known as the Phase I AMI project, includes two studies with $1.25 million in grants from the United States Bureau of Reclamation (USBR) and the Pacific Gas and Electric Company (PG&E). The studies will quantify the water and energy savings for customers that receive more real-time water consumption data from an AMI system. Construction of the Phase I AMI project is nearing completion and preparations are being made to begin operation this summer. This item will be discussed at the April 9, 2019 Planning Committee meeting.

DISCUSSION

The Phase I AMI project includes 13,000 customer accounts distributed throughout the service area. District staff completed installation of all the AMI transmitters in February 2019. Following community outreach and incorporation of community input, major construction of five AMI collectors (i.e., poles and antennas) were completed by a contractor in January 2019. Optimization of the AMI system is underway and District acceptance testing is expected to be completed by June 2019.

The Phase I AMI project includes two studies whose grant funding total $1.25 million. The USBR study includes a $1 million grant from USBR to evaluate the water and energy savings for 3,000 large commercial, industrial, institutional, and residential accounts. A $250,000 grant from PG&E provides partial funding for a collaborative effort between the District, PG&E, and the University of California, Davis (UCD). Using a randomized control trial designed by UCD, the PG&E study includes information from 10,000 residential accounts. Data from these accounts will quantify the water and energy savings associated with customers' access to hourly water consumption through AMI. Both studies are scheduled to begin in July 2019.

FISCAL IMPACT

Project costs to date total approximately $3.9 million, or 60 percent of the project's budget. The business case study is expected to be complete before the FY22/23 budget cycle.

NEXT STEPS

Following testing of the AMI system and one year of operation, the District and a consultant will evaluate the business case for a District-wide AMI project. By January 2020, the District plans to advertise a request for proposals for professional services related to the business case study. Staff will keep the Board apprised as the project progresses.

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EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: April 4, 2019

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager ARC

FROM: Eileen M. White, Director of Wastewater Eileen M. White

SUBJECT: South Interceptor 3rd Street Rehabilitation Phase 2 Project

INTRODUCTION

The District's South Interceptor is a 105-inch diameter concrete pipeline that conveys over 60 percent of wastewater flows along 3rd Street in Oakland to the District's Main Wastewater Treatment Plant. This interceptor is nearing 70 years in continuous service. The concrete above the normal water level in a number of sections has deteriorated, and a phased rehabilitation program is in progress to extend its service life. The second phase will rehabilitate approximately 4,700 linear feet of the interceptor and five manholes. A majority of the rehabilitation will be completed in live sewer flows using sliplining.

Staff provided an overview of this project to the Planning Committee on September 11, 2018. The construction contract was awarded on September 11, 2018, to Mladen Buntich Construction Company in the amount of $12,516,000 under Board Motion No. 124-18. Staff will provide an update of the project to the Planning Committee on April 9, 2019.

DISCUSSION

Construction Progress Update

The South Interceptor is being repaired using sliplining, which begins with the excavation of jacking pits and removing the top half of the existing interceptor within these jacking pits so that new sections of 96-inch pipe can be lowered into the interceptor. It was originally expected that four jacking pits would be required to complete the project. The contractor has devised a way to use only three jacking pits in order to minimize construction time; the eliminated jacking pit is in a residential area located at 3rd Street and Peralta Street, further reducing community impacts. This will also reduce the amount of heavy construction along 3rd Street. The contractor began construction of the first two jacking pits on February 20, 2019.

Traffic Impacts Update

Partial road closures, located on 3rd Street at Filbert Street and Myrtle Street at 3rd Street, will allow at least one lane of traffic in both directions. Flaggers will be utilized as needed when

heavy equipment or material is being moved to ensure the safety of motorists and construction workers.

A full road closure is required on 3rd Street near Union Street for approximately eight months. This is because 3rd Street is tapered at that intersection, so it is not possible to maintain the minimum road width in either direction of traffic while safely transporting pipes to the project site and excavating and shoring the jacking pits. Bicyclist and pedestrian access, as well as local access to adjacent driveways, will be maintained through the course of the full road closure. Motorists will be detoured onto 5th, 6th, and 7th Streets through Mandela Parkway, Adeline Street, and Market Street. These streets will experience increased truck traffic because of the project's vicinity to the Port of Oakland.

Traffic control plans were approved by the City of Oakland on February 19, 2019, and the obstruction permit was issued on February 20, 2019. District staff and the contractor will continue to coordinate with the City of Oakland if traffic control plans need to be modified based on feedback from the public and stakeholders.

Community Outreach Update

The District conducted extensive outreach which included door hangers, notification mailers, phone calls, and in-person meetings with a range of parties potentially impacted by the project. Staff conducted or attended numerous community or individual organization meetings from December 2018 through March 2019. Staff also emailed a project description and provided updates to Oakland Councilmember Lynette Gibson McElhaney's staff and offered to arrange a meeting. Staff met with the West Oakland Environmental Indicators Project on January 24, 2019, and held conference calls with the Bike East Bay organization on three occasions in January and February 2019. Staff carried out additional activities at the request of various stakeholders, such as presenting at community meetings and providing trucking companies and bicyclists with alternate detour routes. Community feedback received thus far has been generally positive and appreciative.

NEXT STEPS

Staff will continue to engage in community outreach efforts throughout the construction period, and will collaborate with the contractor and community stakeholders to address neighborhood impacts as they arise. Construction is scheduled to be completed by September 2020.

ARC:EMW

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: April 4, 2019

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager ARC

FROM: Michael T. Tognolini, Director of Water and Natural Resources MTT

SUBJECT: Annual Recreation Report – 2018

INTRODUCTION

This memo provides an update on recreation activities in EBMUD's watersheds during the past year and reports on key performance indicators (KPIs) established for recreation in the Mokelumne and East Bay watersheds. A presentation on this information will be made to the Planning Committee on April 9, 2019.

SUMMARY

EBMUD's watersheds receive nearly two million visitors per year, primarily at the developed recreation areas at Lafayette and Camanche Reservoirs. In the East Bay, total visits were 1,344,849, up slightly from 2017 levels. Visits to the Mokelumne Recreation areas dropped slightly in 2018. At the same time, revenues at Mokelumne Recreation areas in 2018 reached an all-time high and were up eight percent over the previous year. Significant activities in 2018 include:

- Staff repaired damage on the Pardee Shoreline Trail caused by high reservoir levels and wave action over the last two years;
- The first dog friendly section of watershed trail in the Mokelumne was opened on the Mokelumne Coast to Crest Trail near Camanche; and
- The 2018 East Bay Watershed Master Plan update was completed.

Recreation programs and projects help to ensure a safe and enjoyable experience for our recreational guests and support EBMUD's Long-Term Water Supply, Water Quality and Environmental Protection, and Long-Term Infrastructure Investment Strategic Plan goals.

Mokelumne Watershed and Recreation

The Mokelumne Watershed Master Plan and subsequent management plans establish a number of KPIs for evaluating recreational services based on financial performance, public safety and customer satisfaction levels. The attached Tables 1 through 4 show annual visitation for the Mokelumne Recreation area venues and performance results based on the established KPIs.

KPIs were met for eleven of the twelve benchmarks tracked at the Mokelumne Recreation areas. Visitor safety and customer satisfaction KPIs were met at all Mokelumne Recreation areas. The benchmark of less than one boating accident per 10,000 boat launches was met for the first time since 2015. Cost recovery targets were met at all Mokelumne venues except Pardee Recreation area. This shortfall is attributed in part to initial start-up costs of the new concessionaire as well as significantly higher operational costs associated with the work to upgrade the water treatment plant at Pardee. In addition, the new concession contract calls for a higher Maintenance Capital Improvement Plan contribution compared to past years.

In 2018, a number of significant projects and programs were completed or continued:

- Innovative Integrated Pest Management strategies were successfully implemented including installation of owl boxes to control voles at the Camanche Hills Hunting Preserve, temporary draining of recreational ponds to control nuisance aquatic species, and fall burning and reseeding to control noxious watershed plants;
- Camanche South Shore Marina services were repaired and restored to return land-based fuel and water-based electrical amenities to customers; and
- The combination of new contract terms, high reservoir levels and record revenues resulted in all-time high concessionaire contributions to recreation area Maintenance Capital Improvement Funds of $1,337,446 in 2018. This important funding mechanism allows EBMUD to work with the respective concessionaires to complete vital recreation-related projects without having to rely solely on EBMUD's Capital Improvement Plan funding.

East Bay Watershed Recreation

KPIs are also used in the East Bay watersheds for evaluating recreational services based on financial performance, public safety and customer satisfaction levels. The attached Tables 5 through 8 show annual visitation for the East Bay Recreation area venues and performance results based on the KPIs.

Opportunities to explore and enjoy nature continue to attract visitors to the East Bay reservoirs and watershed trails. In 2018, visitation at the Lafayette and San Pablo Recreation facilities increased by seven percent each, while the watershed trail system showed a 36 percent increase. Cost recovery declined to 59 percent at Lafayette due to several capital improvement projects and remained at 55 percent at San Pablo. Recreation safety in the East Bay continues to be very good. There were no major accidents or reported public safety related events in 2018. Customer satisfaction surveys were 85 percent "Good" or "Excellent" in 2018. A gradual decline in customer service over the last four years attributed to inconveniences associated with capital improvements and slower fishing action.

NEXT STEPS

In 2019, the focus for the Mokelumne Recreation area will be completion of paving in the Camanche Recreation areas and installation of a new entrance gate at Camanche North Shore. EBMUD will continue to address the challenges at the smaller, unstaffed Middle Bar and the Mokelumne River Day Use Recreation areas. In the East Bay, work will continue to replace the aged force sewer main and upgrade the self-contained restroom facilities at Lafayette Reservoir. At the San Pablo Recreation area, upgrading picnic areas and group sites will continue to be a priority. Finally, completion of the new trail map and installation of upgraded signage at staging areas and trail heads is a priority for 2019.

ARC:MTT:dec

Attachment

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Table 1 – Annual Visitation at Mokelumne Recreation Venues (Visitor Days)

Location	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018
Camanche North Shore	170,525	147,726	192,660	242,036	236,674
Camanche South Shore	168,291	164,264	211,040	254,378	259,714
Pardee Recreation Area	66,769	48,140	57,224	89,926	56,630
Mokelumne River Day Use	60,753	53,520	64,252	55,233	48,313
Camanche Hills Hunting Preserve	13,262	12,768	12,462	12,610	13,368
Watershed Trails	8,462	8,259	9,417	9,519	11,199
Total	**488,062**	**434,677**	**547,055**	**663,702**	**625,898**

Table 2 – KPI Performance Results: Percent Cost Recovery for Mokelumne Venues

Location	Goal % Cost Recovery	FY 14	FY 15	FY 16	FY 17	FY 18
Camanche North Shore Recreation Management Area	45%	66%	67%	54%*	64%	71%
Camanche South Shore Recreation Management Area	45%	64%	63%	63%*	54%	68%
Camanche Hills Hunting Preserve	95%	93%	87%	94%	100%	97%
Pardee Recreation Area	40%	40%	45%	34%	46%	38%

**A change in concession reporting skewed the North Shore/South Shore percentages for FY16.*

Table 3 – KPI Performance Results: Public Safety in the Mokelumne Watershed

KPI	Goal	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018
Boating Accidents (# of accidents per boating day)	.01%	.005% 1 accident 20,461 vessels	.000% 0 accident 18,223 vessels	.011% 3 accidents 28,130 vessels	.011% 4 accidents 36,918 vessels	.009% 3 accidents 34,537 vessels
Visitor Incidents (# of visitor incidents per visitor day)	.2%	.06% 294 incidents 488,062 visitors	.06% 273 incidents 434,360 visitors	.04% 207 incidents 547,055 visitors	.04% 243 incidents 663,702 visitors	.04% 249 incidents 625,898 visitors

Table 4 – KPI Performance Results: Visitor Satisfaction Survey for the Mokelumne Venues

Location	Goal	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018
Camanche North Shore	80% "Good" or "Excellent"	83%	95%	97%	95%	95%
Camanche South Shore	80% "Good" or "Excellent"	91%	91%	89%	93%	93%
Camanche Hills Hunting Preserve	80% "Good" or "Excellent"	99%	100%	99%	99%	100%
Pardee Recreation Area	80% "Good" or "Excellent"	93%	97%	98%	96%	96%
Mokelumne River Day Use	80% "Good" or "Excellent"	94%	96%	97%	95%	96%
Watershed Trails	80% "Good" or "Excellent"	98%	99%	98%	98%	99%

Table 5 – Recreation Visitation at East Bay Recreation Venues (Visitor Days)

Location	CY 2014	CY 2015	CY 2016	CY2017	CY2018
Lafayette Recreation Area	1,020,616	1,106,994	1,080,662	1,003,287	1,071,623
San Pablo Recreation Area	143,045	153,045	140,638	137,513	147,154
East Bay Trails	57,133	68,300	71,140	86,500	126.072
Total	**1,220,794**	**1,328,339**	**1,292,700**	**1,227,300**	**1,344,849**

Table 6 – KPI Performance Results: Percent Cost Recovery for the East Bay Venues

Location	Goal (% Cost Recovery)	FY 2014	FY 2015	FY 2016	FY2017	FY2018
Lafayette Recreation Area	65%	84%	82%	79%	79%	59%
San Pablo Recreation Area	40%	N/A	54%	57%	55%	55%

Table 7 – KPI Performance Results: Public Safety in the East Bay Watersheds

KPI	Goal	CY 2014	CY 2015	CY 2016	CY2017	CY2018
Visitor Incidents (number of documented visitor incidents per visitor day)	.2%	.02% 281 incidents 1,220,794 visitors	.03% 403 incidents 1,328,339 visitors	.03% 371 incidents 1,292,700 visitors	.04% 447 incidents 1,227,300 visitors	.025% 335 incidents 1,344,849 visitors

Table 8 – KPI Performance Results: Visitor Satisfaction Surveys East Bay Venues

Location	Goal	CY 2015	CY 2016	CY 2017	CY 2018
All East Bay Recreation Areas	80% "Good" or "Excellent"	94%	92%	89%	85%