

State Water Resources Control Board

Division of Drinking Water

September 17, 2015

Attn: George Brett, President
Morro Rock Mutual Water Company
P.O. Box 757
Cayucos, CA 93430

System Number 4010015 – 2015 Sanitary Survey

Dear Mr. Brett:

Thank you for Robert Ruiz's cooperation during the Morro Rock Mutual Water Company water system inspection on September 11, 2015. The inspection was conducted by Matthew Foster, Sanitary Engineer, and Bill Liang, Water Resource Control Engineer, with the Division of Drinking Water (hereinafter DDW).

The routine inspection of the drinking water system was part of a Sanitary Survey and included examining the source and storage facilities. In addition to the water system inspection, this Sanitary Survey included a review of the distribution system, routine monitoring and reporting to the DDW, water system management and operations, and operator compliance with State requirements. The purpose of the Sanitary Survey is to identify any health concerns related to the water system and to assess the overall construction, operation, maintenance, and management of the water system.

Based on the recent field inspection and review of DDW files, several items were identified that require attention by Morro Rock to increase the reliability and safety of the water system and to meet all applicable regulations. These items are listed below, and are discussed at greater detail along with a broader analysis of the water system in the Sanitary Survey Report enclosed (Enclosure 1). Please complete the enclosed Sanitary Survey response form (Enclosure 2) and return it to our office within 30 days.

Morro Rock Mutual Water Company Sanitary Survey Follow Up Items:

1. As part of the 2012 and 2013 Electronic Annual Reports to the DDW, Morro Rock reported that more backflow prevention devices failed their routine tests than were repaired or replaced. Morro Rock shall work with San Luis Obispo County to ensure that all devices that fail a backflow prevention test are repaired or replaced.
2. During the September 11 inspection, adequate protection with a screen or check valve of Morro Rock's storage tank's overflow line could not be verified. Morro Rock shall ensure that the tank's overflow line is protected against the possible entry of small animals into the tank.

3. Morro Rock is required to monitor its standby wells for asbestos at least every 9 years. The most recent samples were collected during 2002, so monitoring for asbestos is currently overdue and shall be completed before the end of 2015.
4. The 2014 Consumer Confidence Report (CCR) included incorrect information about lead and copper and did not include any results for fluoride, which was detected in the treated water provided by San Luis Obispo County Service Area 10. Morro Rock shall ensure that fluoride results from 2015 are included in the 2015 CCR and that the public health goal and 90th percentile values for lead and copper are correct.
5. It is recommended that the vent on the top of Morro Rock's storage tank be replaced due to corrosion.

If you have any questions regarding this letter, please contact Matthew Foster at (805) 566-6625 or matt.foster@waterboards.ca.gov.

Sincerely,



Jeff Densmore, P.E., District Engineer
Santa Barbara District
Division of Drinking Water
State Water Resources Control Board

Enclosure 1: Sanitary Survey Report
Enclosure 2: Sanitary Survey Response Form
Enclosure 3: Last Sample Date and Monitoring Schedule

cc: San Luis Obispo County Environmental Health Services

State Water Resources Control Board
Division of Drinking Water

September 17, 2015

**Sanitary Survey Report
For
Morro Rock Mutual Water Company
San Luis Obispo County**

**State Water Resources Control Board
Division of Drinking Water
Southern California Field Operations Branch
Matthew Foster, Sanitary Engineer**

I. INTRODUCTION

1.1 PURPOSE OF REPORT

The purpose of this report is to document the findings of the recent Sanitary Survey. Sanitary Surveys are required every three years, at a minimum, and consist of a discussion and survey of eight elements (*Source, Treatment, Distribution System, Finished Water Storage, Pumps/Pump Facilities/Controls, Monitoring/Reporting/Data Verification, System Management and Operation, and Operator Compliance with State Requirements*). Each element is comprised of several components. The public water system is required to comply with all regulations pertaining to each element. If the Division of Drinking Water (hereinafter DDW) identifies a *significant deficiency* in any element category during a Sanitary Survey, the public water system will be required to correct the *significant deficiency* in a specified time frame.

1.2 BRIEF DESCRIPTION OF SYSTEM

The Morro Rock Mutual Water Company (hereinafter Morro Rock) water system is mutually owned and serves a portion of the community of Cayucos. Morro Rock operates one active connection to San Luis Obispo County Service Area 10 (hereinafter CSA 10), two standby wells, and one reservoir to provide potable water to an estimated 2,105 people via 638 service connections. It is classified as a community water system and operates under the authority of permit number 04-06-97P-013, issued by DDW in 1997. The previous Sanitary Survey of Morro Rock was conducted during November of 2011.

1.3 SOURCES OF INFORMATION

All information included in this report was obtained from DDW files, Morro Rock personnel, and a site visit on September 11, 2015.

1.4 WATER DEMAND DATA

Year	Maximum Daily Water Demand (Gallons)	Maximum Monthly Water Demand (Gallons)	Annual Water Demand (Gallons)
2005	178,000*	4,130,000	36,960,000
2006	186,000*	4,310,000*	37,985,000
2007	193,000*	4,481,000	39,582,000
2008	192,000*	4,441,000	36,128,000
2009	--	--	--
2010	179,000*	4,145,000	35,677,000
2011	193,000	4,155,000	34,886,000
2012	160,000	3,969,000	36,508,000
2013	188,000*	4,344,000	39,708,000
2014	166,000*	3,848,000	35,599,000

*Estimated from annual or monthly demand data

Based on the previous ten years of available water use data, the maximum day demand is estimated to be about 193,000 gpd or 135 gpm.

1.5 ENFORCEMENT HISTORY

Since the previous Sanitary Survey, no enforcement actions have been issued to Morro Rock.

II. INVESTIGATION AND FINDINGS

2.1 ELEMENT 1: SOURCES

Morro Rock's primary source of water is a connection to CSA 10. Morro Rock also maintains two standby wells that are considered to be under the influence of surface water and a few emergency connections to Paso Robles Beach Water Association. The wells have been physically separated from Morro Rock's distribution system and must flow through CSA 10's treatment plant before entering the distribution system. The water is filtered and disinfected by CSA 10 for compliance with the surface water treatment rule. A review of water quality sampling indicates that the water from CSA 10 meets all water quality standards,

but that water from Well 1 and Well 3 exceeds secondary maximum contaminant levels (SMCL) for iron and manganese.

2.1.1 GROUNDWATER SUPPLIES

Morro Rock maintains two standby wells as backup water supplies. They are located near CSA 10's Cayucos Water Treatment Plant. The groundwater basin is recharged by the nearby Old Creek, via Whale Rock Reservoir. The wells are shallow wells, have inadequate annular seals, and are considered to be under the influence of surface water when Old Creek is flowing. They require treatment at the Cayucos Water Treatment Plant. The wells are equipped with submersible pumps, concrete well pads, vents, air-release valves, sampling ports, check valves, meters, and flush-to-waste valves. Iron and manganese samples from the wells during 2011 exceeded their respective SMCLs. Morro Rock delegates the operation of the wells to CSA 10 for coordination with the Cayucos Water Treatment Plant.

Drinking water source assessments were completed for Well 1 and Well 3 in 2001 and determined them to be most potentially vulnerable to the following: agricultural drainage, septic systems, sewer systems, agricultural wells, above ground storage tanks, graveyards, high density housing, highways, and other water supply wells.

Source Name & PS Code	Year Drilled	Well Depth (ft.)	Perforations (ft.)	Annular Seal Depth (ft.)	Pump Type	Pump Capacity (gpm)
Well 1 (4010015-001)	1950	68	Unknown	None	Submersible	120
Well 3 (4010015-003)	1984	80	30-80	20	Submersible	245

2.1.2 AUXILIARY SOURCES AND INTERCONNECTIONS

Morro Rock purchases treated surface water from CSA 10. CSA 10's primary source of water is Whale Rock Reservoir. Whale Rock Reservoir has a capacity of about 39,000 acre-feet and is currently about 38% full. The reservoir also serves the City of San Luis Obispo, Cal Poly State University, and California Men's Colony. Recreational activities allowed at the reservoir include hiking and fishing. CSA 10 also utilizes a groundwater well for supplemental water supply. Morro Rock's connection with CSA 10 is six inches in diameter and can provide up to about 600 gpm or 864,000 gpd. Morro Rock also maintains a few emergency interconnections to Paso Robles Beach Water Association.

Water from Whale Rock Reservoir is treated at the Cayucos Water Treatment Plant. The treatment plant utilizes direct filtration via a packaged Mircofloc Trident filtration system and is permitted by DDW to meet the Surface Water

Treatment Rule. The water is treated with chlorine for disinfection purposes before it enters Morro Rock's distribution system.

Name	Diameter (inches)	Capacity (gpm)	Delivers Water To
SLOCSA 10	6	600	Distribution & Tank

2.1.3 ADEQUACY OF SUPPLY

Morro Rock is required to have enough source capacity at all times to meet its maximum day demand, as determined from the past 10 years. Morro Rock has an estimated maximum day demand of 135 gpm and a total source capacity of about 600 gpm, and therefore is considered to have an adequate water supply.

2.1.4 NON-POTABLE WATER

Morro Rock maintains an irrigation well and irrigation distribution system. The well is known as Well 4 or the D Street Well. The irrigation system is fully separated from the domestic water distribution system.

2.2 ELEMENT 2: TREATMENT

No treatment is provided by Morro Rock. Surface water treatment including filtration and disinfection is provided by CSA 10.

2.3 ELEMENT 3: DISTRIBUTION SYSTEM

2.3.1 DISTRIBUTION LINES

Morro Rock's distribution system is made up of about 5 miles of pipeline. The distribution pipelines are made of PVC and asbestos cement. Morro Rock has a long term plan to replace all remaining asbestos cement pipes with PVC pipes. They range from two inches to ten inches in diameter, and are pressurized to between 25 and 82 psi. Many of Morro Rock's higher-elevation service connections use booster pumps to provide adequate pressure, all of which are protected with backflow prevention devices. Dead ends are flushed and distribution system valves are exercised annually. During 2014, about 4% of the water purchased from CSA 10 was lost in the distribution system from flushing, leaks, fire flow, and/or other unmetered uses.

Morro Rock is required to maintain adequate separation between its water supply lines and any pipelines conveying non-potable fluids and/or any waste disposal sites or other potential sources of contamination, as described in the California Waterworks Standards.

2.3.2 CROSS CONNECTION PROGRAM

A total of 50 backflow prevention devices are used to protect the water system from potential cross-connections. Morro Rock is required to ensure that all of the necessary backflow prevention devices are tested annually. An average of 2% are repaired or replaced each year, as shown in Table 4 below. Jon Williams from the San Luis Obispo County Environmental Health Services coordinates the cross-connection control program for Morro Rock. As part of the 2012 and 2013 Electronic Annual Reports, Morro Rock reported that more backflow prevention devices failed their routine tests than were repaired or replaced. **Morro Rock shall work with San Luis Obispo County to ensure that all devices that fail a backflow prevention test are repaired or replaced.**

Year	Number Tested	Number Failed	Number Repaired
2011	41	2	2
2012	59	3	1
2013	44	2	1
2014	52	0	0

2.4 ELEMENT 4: FINISHED WATER STORAGE

One storage tank provides Morro Rock with approximately 200,000 gallons of storage capacity. The tank is constructed of steel. It has a separate inlet and outlet. The tank is filled from the top and emptied from the bottom, and is equipped with an overflow line, ladder, sampling port, level indicator, manhole, drain line, hatch, and screened vent. Cellular antennae have been installed on the tank. The tank is inspected and cleaned if necessary every 3 years. Details of the storage tank are listed below in Table 5. Adequate protection of the tank's overflow line could not be verified during the September 11 inspection. **Morro Rock shall ensure that the tank's overflow line is protected with a screen or check valve to ensure that it is not vulnerable to the entry of small animals. Due to the corrosion of the tank vent, it is recommended that the vent be replaced.**

Name	Type	Year Built	Capacity (gal)	Comments
Tank 1	Welded Steel	1966	200,000	Vent is corroded

2.5 ELEMENT 5: PUMPS, PUMP FACILITIES, AND CONTROLS

Morro Rock does not operate any pump facilities. The distribution system is pressurized by CSA 10, which utilizes a supervisory control and data acquisition (SCADA) system for mostly automatic operation of the Cayucos water systems.

2.6 ELEMENT 6: MONITORING, REPORTING, AND DATA VERIFICATION

2.6.1 SOURCE MONITORING

Morro Rock is required to routinely monitor its groundwater source for general physical parameters, general minerals, inorganic chemicals, radiological chemicals, volatile organic compounds (VOCs), synthetic organic compounds (SOCs), total coliform bacteria, and fecal coliform bacteria (*E. coli*).

2.6.1.1 CHEMICAL MONITORING

The tables below show the results of previous monitoring and the next due dates for future monitoring:

Source Name & PS Code		General Physical & Minerals	Inorganic & Nitrite	Nitrate	Radio-logical	VOCs	SOCs	Asbestos
Well 1 4010015-001	Last Sample	2011	2011	2015	2011	2011	2011	2002
	Frequency	9 Years	9 Years	Annually	9 Years	9 Years	9 Years	9 Years
	Next Sample	2020	2020	2016	2020	2020	2020	2011
Well 3 4010015-003	Last Sample	2011	2011	2015	2011	2011	2011	2002
	Frequency	9 Years	9 Years	Annually	9 Years	9 Years	9 Years	9 Years
	Next Sample	2020	2020	2016	2020	2020	2020	2011

	MCL	DLR	WRR Raw	WRR Treated	WR Well	MR Well 1	MR Well 3
Aggressive Index			12.9	12.7	12.3	12.5	12.7
Bicarbonate Alkalinity (mg/L)			220	207	403	415	403
Calcium (mg/L)			37	34	56	54	53
Carbonate Alkalinity (mg/L)			32	35	ND	ND	ND
Chloride (mg/L)	500*		32	38	46	46	46
Color (Units)	15		4	1	2	8	11
Total Hardness as CaCO ₃ (mg/L)			280	310	400	340	340
Iron (µg/L)	300	100	ND	ND	ND	870	1100
Magnesium (mg/L)			47	55	62	51	51
Manganese (µg/L)	50	20	ND	ND	37	330	240
Odor (Units)	3	1	1.5	1.0	1.0	1.9	1.6
pH (Field)			8.61	8.44	7.28	7.28	7.45
Sodium (mg/L)			41	45	49	50	49
Specific Conductance (µS/cm)	1600*		720	710	840	830	820
Sulfate (mg/L)	500*	0.5	94	96	51	42	40
Total Dissolved Solids (mg/L)	1000*		440	440	510	460	460

	MCL	DLR	WRR Raw	WRR Treated	WR Well	MR Well 1	MR Well 3
Turbidity (Units)	5	0.1	0.95	0.08	0.11	4.4	3.1
Zinc (µg/L)	5000	50	ND	ND	ND	82	ND
Aluminum (µg/L)	200	50	ND	180	ND	ND	ND
Arsenic (µg/L)	10	2	2.8	2.6	ND	ND	ND
Barium (µg/L)	1000	100	ND	ND	110	ND	160
Fluoride (mg/L)	2	0.1	0.42	0.42	0.27	0.37	0.35
Nitrate as N (mg/L)	10	0.4	ND	ND	0.81	ND	ND
Boron (µg/L)		100	ND	ND	140	160	160
Vanadium (µg/L)		3	ND	6.8	5.8	4.6	3.3
Total Alkalinity as CaCO ₃ (mg/L)			230	230	330	340	330
Langelier Index at 62 °F			1.1	0.8	-0.1	0	0.1

*The values for TDS, SC, Cl⁻, and SO₄²⁻ are upper values of MCL ranges for which no fixed MCL has been established.

Morro Rock is required to monitor its standby wells for asbestos at least every 9 years. The wells are constructed in a serpentine formation and are considered to be vulnerable to asbestos. **The most recent samples were collected during 2002, so monitoring for asbestos is overdue and shall be completed before the end of 2015.** A summary of previous asbestos monitoring results is provided below:

	1982	11/1/1994	7/16/2002
Well 1	100 & 170	3	ND
Well 3	--	1	ND

2.6.1.2 BACTERIOLOGICAL MONITORING

To monitor the bacteriological quality of its raw groundwater, Morro Rock is required to test each active well at least quarterly for total coliform bacteria and *E. coli*. Well 1 and Well 3 have not been active during the last several years, so bacteriological monitoring of the wells has not been completed during that time.

2.6.2 TREATMENT MONITORING

Due to the use of surface water by CSA 10, Morro Rock is required to maintain a detectable chlorine residual (> 0.2 mg/L) throughout its distribution system. To ensure that the water meets this requirement, Morro Rock tests distribution system samples for chlorine residual when it collects samples for coliform bacteria as described in section 2.6.3.1 below. The results of the chlorine residual monitoring are summarized in Table 12 below.

2.6.3 DISTRIBUTION SYSTEM MONITORING

Morro Rock is required to routinely monitor its distribution system for total coliform bacteria, fecal coliform bacteria, lead and copper, disinfection byproducts, chlorine residuals, and asbestos when the water has been determined to be aggressive.

2.6.3.1 BACTERIOLOGICAL MONITORING

Morro Rock is required to test at least two samples for bacteria per month from its distribution system. Morro Rock routinely tests two samples every two weeks. Table 9 below summarizes the results:

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	4-0-0	2-0-0	2-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0
2012	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	2-0-0	4-0-0
2013	2-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0
2014	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0	4-0-0
2015	4-0-0	4-0-0	4-0-0	4-0-0	2-0-0	4-0-0	4-0-0					

Key: # of samples collected - # of total coliform positive results - # of *E. coli* positive results

2.6.3.2 LEAD AND COPPER MONITORING

For compliance with the Lead and Copper Rule, Morro Rock tests at least 10 samples collected from its customers' taps triennially. Lead and copper sampling will be due again during the summer months of 2016. Recent results are summarized in Table 10 below:

Sampling Date	Sample Set	# of Samples	90 th % Lead (µg/L)	90 th % Copper (µg/L)
8/21/2013	Triennial	10	ND	ND

2.6.3.3 DISINFECTION BYPRODUCTS AND DISINFECTANT RESIDUALS MONITORING

Morro Rock tests two distribution system locations for total trihalomethanes (TTHMs) and haloacetic acids five (HAA5) quarterly to comply with the standard monitoring requirements for disinfection byproducts. Table 11 below summarizes the quarterly averages of the results:

	'11 Q4	'12 Q1	'12 Q2	'12 Q3	'12 Q4	'13 Q1	'13 Q2	'13 Q3	'13 Q4	'14 Q1	'14 Q2	'14 Q3	'14 Q4	'15 Q1	'15 Q2	'15 Q3
TTHMs (µg/L)	53	56	78	51	57	59	58	57	39	60	49	58	27	48	53	40
HAA5 (µg/L)	23	15	23	17	16	17	10	11	5	13	13	11	3	9	7	6

For compliance with the maximum residual disinfectant level for chlorine of 4.0 mg/L, Morro Rock monitors its distribution system for chlorine residual when it collects its routine bacteriological samples. The monthly averages of the results are listed in Table 12 below:

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	0.90	1.05	1.47	0.64	0.82	0.82	0.64	0.65	0.72	0.79	0.77	0.85
2012	0.75	1.06	0.77	0.93	0.78	0.71	0.75	0.85	0.77	0.88	0.88	0.73
2013	1.01	0.92	0.85	0.87	0.89	0.74	0.90	0.82	0.95	1.09	1.22	1.09
2014	1.03	0.87	1.26	0.97	0.90	1.00	1.10	0.82	0.85	0.75	1.37	0.99
2015	1.03	0.77	0.89	1.17	0.84	0.90	1.09	0.89				

2.7 ELEMENT 7: SYSTEM MANAGEMENT AND OPERATIONS

2.7.1 ORGANIZATION AND PERSONNEL

Morro Rock has served the Cayucos community since 1941. George Brett serves as president, Robert Ruiz as distribution operator supervisor, and Grace Pope as administrative supervisor. Morro Rock operates with an approximately \$650,000 annual budget. Morro Rock charges a flat base rate and flat usage rate to its customers to cover the costs of operation.

2.7.2 OPERATIONAL PLANS AND REPORTING

The DDW has an Emergency Notification Plan on file for Morro Rock dated 2011. Annual Reports are submitted to the DDW and Consumer Confidence Reports (CCR) are distributed to customers by July 1st every year. **The 2014 CCR included incorrect information for lead and copper and did not include any results for fluoride. Morro Rock shall ensure that fluoride results are included in the 2015 CCR and that the public health goal and 90th percentile valves for lead and copper are accurate.** An Emergency Response Plan is on file dated 2011. A Bacteriological Sample Siting Plan was updated in 2008. All operational plans are up to date.

2.8 ELEMENT 8: OPERATOR COMPLIANCE WITH STATE REQUIREMENTS

Morro Rock's distribution system is classified as a D2 distribution system. Morro Rock employs three D2-D3 certified operators to meet the distribution operator requirements. All operators' certifications are up to date.

Facility Name	Sampling Point ID(s)	Classification Required
Distribution System	008, 009	D2

Facility Name	Location	PS Code
Well 1	Cabrillo Street (South)	4010015-001
Well 3	Cabrillo Street (North)	4010015-003
SLOCSA 10 – Cayucos	13 th Street	4010015-007
Distribution System	Ash Avenue and B Street	4010015-008
Distribution System	69 Bakersfield Avenue	4010015-009

III. CONCLUSIONS

The review of Morro Rock's water system indicates that the water system is designed, constructed, operated, and managed well. The sources, storage tank, and distribution system meet state requirements. A review of the routine water quality monitoring results indicates that the water supplied by CSA 10 meets all applicable maximum contaminant levels, although the two standby wells exceed the SMCLs for iron and manganese. Deficiencies include not always ensuring that all backflow prevention devices that fail a routine test are timely repaired or replaced, not ensuring that the storage tank's overflow line is properly protected from the possible entry of small animals, failing to test Well 1 and Well 3 for asbestos within 9 years of the most recent samples, and including incorrect lead and copper information and leaving fluoride results out of the 2014 CCR. It is also recommended that Morro Rock plan to replace the vent on its storage tank due to corrosion.