July 31, 2017

Sanitary Survey Report
For
Atascadero Mutual Water Company – 4010002
San Luis Obispo County

State Water Resources Control Board
Division of Drinking Water
Southern California Field Operations Branch
Kam Kei Chen, Water Resource Control Engineer

I. INTRODUCTION

Purpose of Report

The purpose of this report is to document the findings of the recent Sanitary Survey conducted at Atascadero Mutual Water Company (AMWC). Sanitary Surveys are required every three years, at a minimum, and cover eight different 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 water system needs to comply with all regulations pertaining to each element. If the Division of Drinking Water (DDW) identifies a significant deficiency in any element category during a Sanitary Survey, the water system will be required to correct the significant deficiency in a specified time frame.

System Description and Information

The AMWC is classified as a community public water system. It operates under a domestic water supply permit with permit number 04-06-99P-004, issued by the DDW on January 15, 1999. The permit has been amended seven times. The following are the permit amendments:

- The first permit amendment was issued on September 21, 2001. The amendment was to replace Wells 2A, 6, 8 and 9 with Wells 2B, 6A, 8A and 9A. Wells 2B and 8A were not developed when the permit amendment was issued.
- The second permit amendment was issued on June 9, 2003. The AMWC was to construct a new 630,000 gallon water storage tank (Rojo Tank) with chlorine re-circulation system and to construct up to four new wells along the Salinas River Bank per the permit amendment.
- The third permit amendment was issued on May 19, 2004. The permit amendment was to allow the AMWC to add phosphoric acid as a corrosion control inhibitor to the water supply and to conduct a demonstration study in a portion of the distribution system to show compliance with the Lead and Copper Rule.
- The fourth permit amendment was issued on February 28, 2005. The AMWC was to construct and operate a new 150,000-gallon water storage tank (El Monte Reservoir) with chlorine re-circulation facilities.

- The fifth permit amendment was issued on April 12, 2007. Per the permit amendment, the AMWC constructed and operated a new well (Well 1B) in replacing Well 1A; AMWC also planned to provide system-wide corrosion treatment using phosphoric acid at four treatment buildings.
- The sixth permit amendment was issued on July 12, 2011. The AMWC was to add two new wells (Wells 25 and 26) under this permit amendment.
- The seventh permit amendment was issued on January 27, 2016. The permit amendment was to allow the AMWC to change its corrosion inhibitor from phosphoric acid to NSF certified orthophosphate AquaPure 3601, manufactured by Brenntag Pacific.

AMWC provides potable water services to residential, industrial and commercial/institutional customers located within its service area. AMWC is located in northern San Luis Obispo County along Highway 101.

AMWC operates 17 active groundwater wells, a connection to the Nacimiento Water Project (NWP for purchasing of raw surface water), five treatment facilities, nine domestic water storage reservoirs, eight booster pump stations, and a distribution system. AMWC maintains an emergency interconnection with the Templeton Community Services District. It has one standby well – Well 14. AMWC serves a population of approximately 31,536 as reported in its 2016 electronic Annual Report. AMWC has 10,742 active connections. The majority of the service connections are residential connections with a total of 9,800 connections. The remaining service connections include 702 commercial or institutional, 26 industrial, 214 landscape irrigation connections. AMWC reported 178 other service connections (including fire suppression, street cleaning, line flushing construction and temporary meters) in its 2015 Annual Report.

DDW previously conducted a Sanitary Survey of AMWC on August 14, 2013. AMWC has not been cited for a violation since the 2013 Sanitary Survey.

Source of Information
All information included in this report is from DDW files, AMWC personnel, and site visits on June 28 and July 5, 2017.

II. INVESTIGATION AND FINDINGS

II.a Element 1 – Sources

Surface Water – Nacimiento Water Project
AMWC receives untreated raw surface water from the Nacimiento Water Project (MWD). The raw surface water connection is capable of 3,680 gallons per minute (gpm). It is entitled to 3,244 acre-feet of the NWP raw surface water per year; AMWC plans to use the NWP water during drought conditions. The NWP's water supply is from the Nacimiento Lake. The Nacimiento Lake is used for recreational activities including water/body contact recreation, boating, fishing, picnicking and overnight camping.

AMWC has constructed a recharge basin for storing the raw surface water and four wells for recovering the water after ground filtration. The recharge basin is located at AMWC's deep well field. The basin has an area of 1.5 acre and a depth of four feet. Raw surface water from NWP is discharged into the recharge basin. The NWP water is recovered by Wells 7, 9A, 25 and 26. Well 7 is located approximately 335 feet east of the basin in an upgradient location. Well 9A is located 615 feet north of the basin in a generally downgradient location. Well 25 is located 407 feet northwest of the basin in a generally downgradient location. Well 26 is located 392 feet north of the basin in a generally downgradient location. AMWC conducted tracer studies between November 2010 and May 2011; and between June 2012 and October 2012. The 2010/2011 study was terminated because the groundwater levels were too high to be considered "worst case scenario." The 2012 study found that the surface water discharged into the recharge basin has indiscernible influence on the water quality in the four recovery wells and therefore the four wells were determined to be not under the influence of the raw surface water from the discharge basin.

Groundwater Considered Under the Direct Influence of Surface Water – Wells 3A and 5
Wells 3A and 5 are considered under the direct influence of surface water when the Salinas River is flowing and is within 150 feet of the wells, normally during the months from December to June. The Salinas River riverbed is about 30 feet lower in elevation than the wellheads. On January 12, 1993, DDW issued a compliance order to AMWC for Wells 3A and 5 to comply with the Surface Water Treatment Rule (SWTR). The wells need to comply with SWTR monitoring requirements when surface water is within 150 feet of the wells in order to be used.

AMWC reported that it will only operate Wells 3A and 5 when the Salinas River bed is dry, mainly during the summer months. If AMWC uses the wells when surface water is between 100 and 150 feet from the wells, AMWC will need to perform turbidity, chlorine residuals, pH and temperature monitoring in addition to complying with the chlorine-contact time (CT) requirements. Natural filtration will be allowed under this situation. The monitoring results (if required) along with the daily distance of the wells from the surface water and well operation status shall be submitted monthly to the DDW Santa Barbara Field Office. AMWC has modified its distribution system so the water from Wells 3A and 5 has enough chlorine contact time to meet the SWTR requirements.

Groundwater
AMWC has 17 active groundwater wells – Wells 1B, 2A, 3A, 4, 5, 5A, 6A, 7, 8A, 9A, 10, 12, 13A, 16, 19, 25 and 26. Well 14 is designated as a standby well. All the wells can discharge to waste upon starting up. Water from discharge to waste is used to recharge the groundwater around the well sites. There are no sewer lines or sewage disposal facilities located within 50 and 100 feet of well sites, respectively. All the active wells are equipped with a de-sander. The sand in the de-sanders can be flushed out through a pipe that discharges away from the well sites. Water from the flushing is used to recharge the groundwater around the well sites. The discharge pipes from the de-sanders are screened. The air vacuum release valves for the wells are screened. Most of the active wells are located more than 150 feet from surface water and are not subject to the SWTR, except for Wells 3A and 5 when the Salinas River is flowing. Please refer to the previous subsection for more information. AMWC operators visit the wells every Monday to check on the well conditions and instruments. The operating wells are visited daily.

AMWC conducted the drinking water source assessment of all the wells back in 2013, except Wells 25 and 26 in May 2011. The following table lists the top possible contaminating activities for the wells.

Table 1: Possible Contaminating Activities

Well	Physical Barrier Effectiveness	Possible Contaminating Activities (top ranked)
Well 1B	Moderate	High density septic systems, automobile repair shops, Grazing [>5 large animals or equivalent per acre], sand/gravel mining, low density septic systems, sewer collection systems, agricultural/irrigation wells
Well 2A	Moderate	Automobile repair shops, low density septic systems, sewer collection systems, transportation corridors – railroads, agricultural/irrigation wells

Table 1: Possible Contaminating Activities		
Well	Physical Barrier Effectiveness	Possible Contaminating Activities (top ranked)
Well 3A	Moderate	Sand/gravel mining, low density septic systems, sewer collection systems, agricultural/irrigation wells
Well 4	Moderate	Low density septic systems, sewer collection systems, agricultural or irrigation wells, storm drain discharge
Well 5	Low	High density septic systems, grazing [.5 large animals or equivalent per acre], sand/gravel mining, low density septic systems, sewer collection systems, agricultural/irrigation wells, above ground storage tanks
Well 5A	Low	Grazing [>5 large animals or equivalent per acre], sand/gravel mining, low density septic system, sewer collection systems, agricultural/irrigation wells
Well 6A	Moderate	Low density septic systems, sewer collection systems, agricultural or irrigation wells
Well 7	Moderate	Low density septic systems, sewer collection systems, storm water discharge point and streams/lakes/river
Well 8A	Moderate	Low density septic systems, transportation corridors – railroads
Well 9A	Moderate	Water supply wells, agricultural/irrigation wells
Well 10	Moderate	Water supply wells, surface water – streams or lakes or rivers, agricultural/irrigation wells
Well 12	Moderate	Grazing [>5 large animals or equivalent per acre], other animal operations, low density septic systems, agricultural/irrigation wells,
Well 13A	Moderate	Low density septic systems, storm drain discharge points, transportation corridors – railroads
Well 16	Low	Low density septic systems, sewer collection systems, water supply wells, agricultural/irrigation wells
Well 19	Low	Water supply wells, surface water – streams/lakes/rivers, transportation corridors – roads, streets and railroads
Well 25	Moderate	Water Supply wells, surface water – streams/lakes/rivers
Well 26	Moderate	Water Supply wells, surface water – streams/lakes/rivers
Well 14 – Standby	High	Low density septic systems, transportation corridors, monitoring wells/test holes, agricultural/irrigation wells

Well 1B
The well was constructed in 2007 with a depth of 75 feet. It has a 50 feet annular seal and a concrete surface seal. The well is equipped with a 16-inch stainless steel casing. The highest perforations are 50 feet below the ground level. The well is housed in a building. It is located in the Sycamore Well Field and draws water from the Salinas River underflow. The well goes to Treatment Plant C before entering the distribution system. The water from discharge to waste and de-sander flushing goes to the storm water recharge pond for recharging the groundwater.

Well 2A
The well was constructed in 1981 with a depth of 105 feet. It is housed in a metal building. The well has a 16-inch steel casing and is packed with gravel. The highest perforations are 50 feet below the ground level. The well has a 50 feet annular seal and a surface seal. There is a 20 feet thick clay layer located at 30 feet deep. The well was reactivated three years ago as an active source because of the drought. However, AMWC has not used it since the activation.

Well 3A
The well was constructed in 1983 with a depth of 75 feet. It is located in the Salinas River plain. The well is subjected to the SWTR requirements when surface water is flowing within 150 feet of the well. Please refer to the “Groundwater Considered Under the Direct Influence of Surface Water” section for detailed information. However, AMWC turns off the well when it is subjected to the SWTR requirements.

The well is housed in a metal building. It is equipped with a 16-inch steel casing and packed with gravel. The highest perforations are 50 feet below the ground level. The well has a 50 feet annular seal and a surface seal. Water from the well goes to Treatment Plant C before entering the distribution system.

Well 4

The well was constructed in 1960 with a depth of 86 feet. It is housed in a metal building. The well has a 16-inch steel casing, which was lined with a 12-inch polyvinyl chloride (PVC) casing in 2015, and is packed with gravel. The highest perforation is 21 feet below ground surface. The well has a 20 feet annular seal and a surface seal. There is a four feet clay layer located at 17 feet deep. Water from the well goes to either Treatment Plant A or B before entering the distribution system. However, when AMWC is receiving water from the NWP, water from the well only goes to Treatment Plant A.

Well 5

The well was constructed in 1969 with a depth of 89 feet. It was repaired in 2010. The well is located in the Salinas River plain. It is subjected to the SWTR requirements when surface water is flowing within 150 feet of the well. Please refer to the "Groundwater Considered Under the Direct Influence of Surface Water" section for detailed information. However, AMWC turns off the well when it is subjected to the SWTR requirements.

The well is housed in a building. It is equipped with a 12-inch polyvinyl chloride (PVC) casing that is located inside a 16-inch steel casing. The highest perforations are 20 feet below the ground level. The well has a 20 feet annular seal and a surface seal. A three feet clay layer is located at a depth of 15 feet before the highest perforations. Water from the well goes to Treatment Plant C before entering the distribution system. AMWC replaced the well pump in April 2017. The pump is capable of 800 gallons per minute (gpm), but is capped at 650 gpm when operating.

Well 5A

The well was constructed in 1994 with a depth of 100 feet. It is housed in a metal building. The well has a 12-inch PVC casing and is gravel packed. The highest perforations are 50 feet below the ground level. The well has a 50 feet annular seal and a surface seal. There are no clay layers above the highest perforations. The water from the well goes to Treatment Plant C before entering the distribution system. The well production is capped at 650 gpm, although it is capable of producing more water.

Well 6A

The well was constructed in 2002 with a depth of 480 feet. It is equipped with a 16-inch stainless steel casing. The well is surface sealed and has a 70 feet deep annular seal. Its highest perforations are 240 feet below the surface. The well is housed in a building. The well water contains hydrogen sulfide and is turned on only when demands are high. Well water goes to either Treatment Plant A or B before entering the distribution systems. When AMWC is receiving water from the NWP, the well water only goes to Treatment Plant B.

AMWC has not use the well for many years. The last time it was online was October 2012. AMWC does not intend to use the well it's absolutely necessary and it is very unlikely that the well will be used in the next several years, according to AMWC's chief operator.

Well 7

The well was constructed in 1972 with a depth of 500 feet. It is located near the Salinas River, but is over 150 feet away and therefore not subjected to SWTR. The well is housed in a metal building. It is equipped with a 16-inch steel casing and packed with gravel. The highest perforations are 157 feet below the ground level. The well has a 63 feet annular seal and a surface seal. There are three clay layers located above the highest perforation. The clay layers are located at depths of 49 feet (four feet thick), 62 feet (11 feet thick) and 79 feet (9 feet thick). Well water goes to either Treatment Plant A or B before entering the distribution system. When AMWC is receiving water from NWP, well water goes to Treatment Plant F for chlorine injection followed by corrosion chemical feed from Treatment Plant B. The water from de-sander flushing discharges to the north of the well site. The discharge to waste water goes to the south of the well site.

Well 8A
The well was constructed in 2004 with a depth of 425 feet. It is equipped with a 12-inch steel casing and packed with gravel. The well is surface sealed and has a 60 feet annular seal. The well's highest perforations are 147 feet below ground level. It has a clay layer located above the highest perforations. That 51 feet thick clay layer is located at the depth of 11 feet. Well water goes to Treatment Plant D before entering the distribution system.

Well 9A
The well was constructed in 2000 with a depth of 500 feet. It is equipped with a 16-inch steel casing and packed with gravel. The well is surface sealed and has a 70 feet annular seal. The well is housed in a building. The highest perforations are located 155 feet below ground level. The well water goes to either Treatment Plant A or B before entering the distribution system. When AMWC is receiving water from NWP, the well water then receives chlorination from Treatment Plant F followed by corrosion control chemical injection from Treatment Plant B. The discharge to waste pipe is screened.

Well 10
The well was constructed in 1985 to 550 feet deep. It is housed in a metal building. The well is located near the Salinas River, but is more than 150 feet away from surface water and therefore not subjected to the SWTR. The well has a 16-inch steel casing and is packed with gravel. The highest perforations are located 192 feet below the ground surface. The well has a 50 feet annular seal and a surface seal. There are four clay layers located above the highest perforations. The clay layers are located at 12 (two feet thick), 25 (15 feet thick), 61 (three feet thick), and 73 (six feet thick) feet below the ground level. Water from the well goes to either Treatment Plant A or B before entering the distribution system. When AMWC is receiving water from NWP, the well water only goes to Treatment Plant A.

Well 12
The well was constructed in 1988 to 603 feet deep in a rural area. It is housed in a metal building. The well has a 16-inch steel casing and is packed with gravel. The highest perforations are located 300 feet below the ground level. The well has a 50 feet annular seal and a surface seal. Five clay layers are located above the highest perforations. The clay layers are located at 26 (13 feet thick), 43 (five feet thick), 50 (four feet thick), 58 (17 feet thick), 78 (six feet thick) and 87 (13 feet thick) feet from the ground surface. AMWC only runs the well when demand is high because of the presence of hydrogen sulfide in the well water. Water from the well goes to Treatment Plant C before entering the distribution system.

AMWC has not used Well 12 since September 2011 and it does not intend to use the well unless it really needs to. AMWC's chief operator said it is very unlikely that the well will be used over the next several years.

Well 13A

The well was constructed in 1998 to 330 feet deep in a rural area. It is housed in a metal building. The well has a 12-inch stainless steel casing and is gravel packed. The highest perforations are located 210 feet below the ground level. The well has a 54 feet annular seal and a surface seal. Two clay layers are located above the highest perforations at depths of 29 feet (40 feet thick) and 77 feet (122 feet thick). Well water goes to Treatment Plant D before entering the distribution system.

Well 16
The well was constructed in 1994 to 72 feet deep in a rural area near the Salinas River. It is housed in a building. The well has a 12-inch PVC casing and is gravel packed. It has a 35 feet annular seal and a surface seal. The highest perforations are located at 37 feet below the ground level. A clay layer is located at 29 feet deep which is five feet thick. Well water goes to either Treatment Plant A or B before entering the distribution system. When AMWC is receiving water from NWP, well water goes to only Treatment Plant A.

Well 19
The well was constructed in 1994 to 180 feet deep in a rural area near the Salinas River. It is housed in a building. The well has a 12-in PVC casing. It has a 35 feet annular seal. The highest perforations are located at 35 feet below the ground level. There is no clay layer above the highest perforations. Well water goes to either Treatment Plant A or B before entering the distribution system. When AMWC is receiving water from NWP, the well water only goes to Treatment Plant A.

Well 25
The well was constructed in 2011 to a depth of 400 feet. It is housed in a building. The well has a 16-inch diameter stainless steel casing and is gravel packed. It has a 90 feet annular seal and a surface seal. The highest perforations are located 155 feet below ground level. There is no clay layer located above the highest perforations. Well water goes to either Treatment Plant A or B before entering the distribution system. When AMWC is receiving water from the NWP, the well water then goes to Treatment Plant F for chlorine injection and then Treatment Plant B for corrosion control chemical feed.

Well 26
The well was constructed in 2011 to 500 feet deep. It is housed in a building. It has a 16-inch stainless steel casing and is gravel packed. The well's annular seal is 90 feet deep and is surface sealed. The highest perforations are located at 160 feet below the ground level with no clay layer located above. The well water goes to either Treatment Plant A or B before entering the distribution system. When AMWC is receiving water from the NWP, the well water then goes to Treatment Plant F for chlorine injection and then Treatment Plant B for corrosion control chemical feed.

Well 14 (Summit Hills) – Standby
The well was constructed in 1978 to 515 feet deep. It is housed in a building. The well has a 5-inch PVC casing and is gravel packed. The highest perforations are located 225 feet below the ground level. The well has a 55 feet annular seal and a surface seal. There is no clay layer located above the highest perforations. The well is used only for emergency purposes.

The following table has additional information for the active and standby wells.

Table 2: Active Well Information

Source Name	PS Code	Well Yield (gpm)	Highest Perforations (ft)	Pump Type and Engine Horse Power (hp)	Pump Capacity (gpm)
Well 1B	4010002-050	500	50	100-hp	600
Well 2A	4010002-022	800	50	Deep water turbine, 125-hp	800

Table 2: Active Well Information					
Source Name	PS Code	Well Yield (gpm)	Highest Perforations (ft)	Pump Type and Engine Horse Power (hp)	Pump Capacity (gpm)
Well 3A	4010002-023	320	50	Deep well turbine pump, 75-hp	320
Well 4	4010002-006	800	20	Deep well turbine pump, 125-hp	800
Well 5	4010002-007	650	20	Deep well turbine pump, 220-hp natural gas engine	800
Well 5A	4010002-015	400	50	Deep water turbine pump, 75-hp	400
Well 6A	4010002-042	600	240	200-hp deep water turbine pump, 365-hp natural gas engine	600
Well 7	4010002-009	800	157	Deep well turbine pump, 365-hp natural gas engine	800
Well 8A	4010002-044	360	60	Submersible pump, 50-hp	360
Well 9A	4010002-040	900	155	Deep water turbine pump, 365-hp natural gas engine	900
Well 10	4010002-012	900	192	Deep well turbine pump, 330-hp natural gas engine	900
Well 12	4010002-001	450	300	Deep well turbine pump, 100-hp	450
Well 13A	4010002-020	650	210	Deep well turbine pump, 125-hp electric motor	650
Well 16	4010002-016	500	37	Deep well turbine pump, 75-hp electric motor	500
Well 19	4010002-018	700	35	Deep well turbine pump, 175-hp natural gas engine	700
Well 25	4010002-053	1,000	155	Submersible pump, 175-hp	1,000
Well 26	4010002-054	1,000	90	Submersible pump, 175-hp	1,000
Well 14 - Standby	4010002-002	70	225	Submersible pump, 15-hp	70

Note: ft = feet, hp = horsepower, gpm = gallons per minute

Table 3: Water Demand Data					
Year	Maximum Day		Maximum Month Demand		Annual Water Demand (MG)
	Date	Volume (MG*)	Month	Volume (MG)	
2007	---	10.0	July	286.4	2,208
2008	---	10.03	July	279.27	2,139
2009	7/24	8.3	July	239	1,828
2010	---	8.3	July	241	1,809
2011	7/17	8.82	July	220.7	1,709
2012	8/10	8.9	August	252.94	1,910.52
2013	7/1	9.38	July	238	1,977
2014	6/30	7.2	June	199	1,691
2015	In June	5.92	September	155	1,439
2016	In June	7	July	182	1,472

*MG = Million Gallons. For July of 2006 to 2008, the volumes were for surface water only.

The maximum day demand in the last 10 years was 10.03 MG of water in 2008. AMWC's 17 active wells are capable of producing 11,330 gpm or 16.3 MG per day (MGD). The nine potable water storage tanks can store up to 17.05 MG of water. Based on the maximum day demand of 10.03 MG of water from 2008, AMWC has adequate source and storage capacity to meet the maximum day demand according AMWC's demand data from the last 10 years.

II.b Element 2 – Treatment

AMWC has constructed five treatment facilities to provide disinfection and corrosion control for the well waters. Four treatment facilities can provide both disinfection and corrosion control treatments. One treatment facility only has the ability to provide disinfection treatment. The treatment facilities are centralized treatment points for the 17 active wells. Each treatment facility can treat water from multiple wells. AMWC's operators visit and inspect the treatment plants daily. The following table has more information about the treatment facilities.

Table 4: Treatment Facilities

Treatment Plants	Associated Wells	Types of Treatment
Plant A	4, 6A, 7, 9A, 10, 16, 19, 25 and 26	Disinfection and corrosion control
Plant B	4, 6A, 7, 9A, 10, 16, 19, 25 and 26	Disinfection and corrosion control
Plant C	1B, 2A, 3A, 5, 5A and 12	Disinfection and corrosion control
Plant D	8A and 13A	Disinfection and corrosion control
Plant F	7, 9A, 25 and 26	Disinfection

Chlorination Treatment

All the treatment plants are equipped with chlorination systems. AMWC disinfects the well waters using NSF 60 certified 12.5 percent sodium hypochlorite solution. Each treatment facility has its own storage tanks and pumps for injection of the 12.5 percent sodium hypochlorite into the well waters. Treatment Plants A, B and C each has a 1,000 gallon tank for the sodium hypochlorite. Treatment Plant D has a 525 gallon tank for the sodium hypochlorite. Treatment Plants A, B and C each has two sodium hypochlorite pumps; each pump is capable of 41 gallons per day (gpd). Treatment Plant D has two chlorine injection pumps; each pump is capable of 22 gpd. The treatment facilities typically are set to dose the water to 1.0 to 1.2 milligrams per liter (mg/L). Treatment Plants A, B, C and D are each equipped with a HACH CL-17 chlorine analyzer which monitors and sends high/low chlorine residual alarms to the SCADA, which in turn can page the on-call operator automatically.

Treatment Plants A, B, C and D all have a static mixer installed after the chlorine injection point to ensure adequate mixing of the injected chemicals. The treatment plants also have main line butterfly valves on the incoming and outgoing side of the facilities for maintenance or other events in which isolation of the treatment plants are warranted.

When the recharge basin is receiving untreated surface water from NWP, Treatment Plant F is used to meter, measure the turbidity and disinfect the combined recovery well water flow from Wells 7, 9A, 25 and 26. It has a 1,000 gallon chlorine tank and containment vessel, two 41 gpd Pulsa feeder chlorine injection pumps, a Hach CL-17 chlorine analyzer, one turbidimeters (Hach 1720D) and a McCrometer 395L insertion flow meter & converter. Treatment Plant F has a 15 kilowatt backup generator in case of emergency. The chlorine residual leaving Treatment Plant F is to be maintained between 1.0 to 1.3 mg/L.

Seven of the nine storage reservoirs can experience low chlorine residual due to water stagnation because of low demand. Those reservoirs are Chalk Mountain, El Monte, Rojo, San Carlos, San Marcos, Santa Ana and Summit Hills. To mitigate the low chlorine residual levels, AMWC has installed re-circulating systems at those reservoirs to chlorinate the reservoir water. Water is pulled out from the reservoir at one end and injected with chlorine before being sent back to the reservoir at the opposite end. A chlorine residual of 0.5 milligram per liter (mg/L) is maintained in the re-circulation line. AMWC monitors the chlorine residual continuously at the reservoir sites.

Corrosion Control Treatment
Treatment Plants A, B, C and D are equipped with chemical storage tanks and pumps for corrosion control treatment. AMWC currently uses AquaPure 3601, 100 percent orthophosphate for corrosion control treatment, as specified in the 2016 Permit Amendment.

Treatment Plant A and B are located at opposite end of the Deep Well Field (Wells 4, 6A, 7, 9A, 10, 16, 19, 25 and 26), north and south respectively. When the re-charge basin is not receiving un-treated surface water from NWP, Treatment Plants A and B can receive water from Wells 4, 6A, 7, 9A, 10, 16, 19, 25 and 26. When AMWC is receiving water from NWP, waters from Wells 7, 9A, 25 and 26 will receive chlorination from Treatment Plant F first and then corrosion control treatment from Plant B before entering the distribution system; Wells 4, 10, 16 and 19 will receive chlorination and corrosion control treatment from Treatment Plant A.

Treatment Plants A and B each has two pumps for injecting the orthophosphate in to the well waters. Each pump is capable of 20 gpd. Treatment Plant C has two 12 gpd pumps for corrosion control treatment. Treatment Plant D has two orthophosphate feed pumps, each is capable of 6 gpd. AMWC set target dosage to be between 0.9 to 1.5 mg/L in the water leaving the treatment plants.

II.c Element 3 – Distribution System

AMWC's water distribution system consists of 11 pressure zones. The pressures in the distribution system range from 30 to 230 pounds per square inch (psi). AMWC has installed pressure reducers in areas of high pressure. The distribution mains consist of 6 to 24-inch Class 150 and 200 polyvinyl chloride (PVC), 4 to 24-inch Class 150 and 200 asbestos cement, and 8 to 24-inch cast iron pipes. AMWC has a plan to replace the inadequate size mains. AMWC uses at least 6-inch PVC pipes to replace old or to install new mains. The mains have minimum depth of cover of 36 inches. It's AMWC's practice and policy to keep the potable water mains 10 feet horizontal and one foot vertical from sewers and/or sewage disposal pipelines.

For newly installed lines, AMWC will use HTH tablets or chlorine gas to disinfect them with a 24-hour contact time and a final chlorine residual of at least 25 mg/L. Bacteriological tests are made after the disinfection. For fractured mains, repairs are made according to American Water Works Association (AWWA) specifications. AMWC shall use products that meet the NSF Standard 60 and 61 when disinfecting and or replacing new, repaired or replaced lines.

AMWC has 262 dead ends (51 with blowoffs) in its distribution system. The dead ends are flushed from monthly to annually. In 2016, AMWC flushed 166 dead ends. AMWC has 1900 4 to 24-inch valves in its distribution system. The valves are exercised every three years. AMWC exercised 500 valves in 2016. AMWC reported 793 backflow prevention devices in its domestic water system with 792 being tested in 2016. **All backflow prevention devices need to be tested every year and AMWC shall make sure the devices are tested.** The following table includes more information about the backflow prevention tests history since 2014.

Table 4: Backflow Prevention Device Testing Results					
Year	Total # in System	# Installed	# Tested	# Failed	#Repaired
2014	813	16	848	56	43
2015	801	13	765	8	81
2016	793	8	792	66	66

II.d Element 4 – Finished Water Storage

AMWC maintains nine distribution reservoirs that can store up to a total of 17.05 MG of water. AMWC can monitor the reservoirs on SCADA, such as reservoir levels. All the reservoirs are equipped with chlorine re-circulation systems, except Pine Mountain and Random Oaks Reservoirs. AMWC operators inspect the reservoirs on a monthly basis.

Chalk Mountain Reservoir
The reservoir was constructed above ground and of concrete in 1976. It has a storage capacity of 2.95 MG. The reservoir is located on Chalk Mountain in a rural area. The reservoir site is fenced. In 2010, AMWC installed a new aluminum dome shape roof in replacement of a wooden roof. Water flows into the reservoir through a 16-inch inlet. Water leaves the reservoir through a 20-inch outlet. The reservoir receives water from the Main Pressure Zone and Well Fields. It delivers water to the Del Rio, El Verano, San Gabriel and Toloso Booster Pump Station. It also serves the Main Pressure Zone. The reservoir has a re-chlorination system which helps to boost the chlorine residual in the reservoir water to between 0.5 to 0.8 mg/L. The reservoir’s drain and overflow discharge to a sump and from there to the hillside. Its air vent is screened.

El Monte Reservoir
The reservoir was constructed above ground and of welded steel in 2005. It is located in a rural area. The reservoir site is fenced. The reservoir has a capacity of 150,000 gallons. Water flows into and out of the reservoir through a common inlet/outlet. The reservoir is equipped with cathodic protection to minimize corrosion. The reservoir receives water from the Cencero Booster Station. It delivers water to the Cencero Pressure Zone. The reservoir has a re-circulating chlorination system which helps to maintain the chlorine residual level between 0.5 to 0.8 mg/L in the reservoir. The reservoir’s drain and overflow discharge to a sump which leads to the hillside. The air vent is screened.

Pine Mountain Reservoir
The reservoir was constructed above ground and of concrete in 1960. It has a storage capacity of 1.53 MG. The reservoir is located in a rural/residential area. The reservoir site is fenced. In 1998, AMWC installed a new steel roof in replacement of a wooden roof. Water flows into the reservoir through a 10-inch inlet. Water leaves the reservoir through a 24-inch outlet. The reservoir receives water from the Main Pressure Zone and Well Fields. It delivers water to the Del Rio, El Verano, San Gabriel and Toloso Booster Pump Station. It also serves the Main Pressure Zone. The reservoir’s drain and overflow discharge to a creek down the hill. Its air vents are screened.

Random Oaks Reservoir
The reservoir was constructed above ground and of concrete in 1981. It has a storage capacity of 0.97 MG. In 2014, AMWC constructed a new low rise aluminum dome over the reservoir to replace the wood roof and concrete columns. The reservoir is located in a residential area. The reservoir site is fenced. The Random Oaks Booster Pump Station is located at the reservoir site. The reservoir receives water from Wells 8A and 13A. It delivers water to the Random Oaks Booster Pump Station. It also serves the Random Oaks Pressure Zone. The reservoir’s drain and overflow discharge to a sump which leads to the hillside. Its air vent is screened.

Rojo Reservoir
The reservoir was constructed above ground and of welded steel in 2004. It is located in a rural/residential area. The reservoir site is fenced. The reservoir has a capacity of 630,000 gallons. Water flows into the reservoir through a 6-inch inlet. Water flows out of the reservoir through a 10-inch outlet. The reservoir is equipped with cathodic protection to minimize corrosion. The reservoir receives water from the San Marcos Booster Station and the Summit Hills Pressure Zone. It delivers water to the Rojo Pressure Zone. The reservoir has a re-circulating chlorination system which helps

to maintain the chlorine residual level between 0.5 to 0.8 mg/L in the reservoir. The reservoir's drain and overflow discharge to a culvert which eventually leads to the hillside. The air vent is screened.

San Carlos Reservoir
The reservoir was constructed above ground and of welded steel in 1992. It is located in a rural area. The reservoir site is fenced. The reservoir has a capacity of 4.82 MG. Water flows into and out of the reservoir through a common 14-inch inlet/outlet. The reservoir is equipped with cathodic protection to minimize corrosion. The reservoir receives water from the Main Pressure Zone and the Well Fields. It delivers water to the Del Rio, El Verano, San Gabriel and Toloso Booster Pump Station. It also serves the Main Pressure Zone. The reservoir has a re-circulating chlorination system which helps to maintain the chlorine residual level between 0.5 to 0.8 mg/L in the reservoir. The reservoir's drain and overflow discharge to sump which leads to the hillside. The air vent is screened.

San Marcos Reservoir
The reservoir was constructed above ground and of concrete in 1981. It has a storage capacity of 2.93 MG. In 2008, AMWC installed an aluminum dome shaped roof in replacement of the original wooden roof. The reservoir is located in a rural/residential area. The reservoir site is fenced. The reservoir receives water from the San Gabriel Booster Station. It delivers water to the San Marcos Booster Station. It also serves the San Marcos Pressure Zone. The reservoir has a re-circulating chlorination system which helps to maintain the chlorine residual level between 0.5 to 0.8 mg/L in the reservoir. The reservoir's drain and overflow discharge to a sump which then drains down to the hillside. Its air vent is screened.

Santa Ana Reservoir
The reservoir was constructed above ground and of welded steel in 1980. It is located in a rural/residential area. The reservoir site is fenced. The reservoir has a capacity of 2.98 MG. Water flows into and out of the reservoir through a common 12-inch inlet/outlet. The reservoir is equipped with cathodic protection to minimize corrosion. In 2004, AMWC changed the internal coating from coal tar to epoxy, painted the exterior, replace the air vent and the access ladder with a stair case. The reservoir receives water from the Del Rio Booster Pump Station. It delivers water to the Cencero Booster Pump Station. It also serves the Santa Ana Pressure Zone. The reservoir has a re-circulating chlorination system which helps to maintain the chlorine residual level between 0.5 to 0.8 mg/L in the reservoir. The reservoir's drain and overflow discharge to sump which leads to the hillside. The air vents are screened. **Paint is peeling off the roof of the reservoir, but there is still an under layer of lead paint. AMWC plans to re-paint the reservoir later in 2017.**

Summit Hills Reservoir
The reservoir was constructed above ground and of welded steel in 1980. It is located in a rural/residential area. The reservoir site is fenced. The reservoir has a capacity of 90,000 gallons. Water flows into and out of the reservoir through two separate inlet/outlets. One is 6-inch and the other is 10-inch. The 10-inch inlet/outlet is used to provide water to the Summit Hills Booster Station. In 2012, AMWC recoated the interior and exterior of the reservoir. It replaced the air vents, hatch and the interior ladder in that same 2012 project. The reservoir is equipped with cathodic protection to minimize corrosion. The reservoir receives water from the San Marcos Booster Station. It delivers water to the Summit Hills Booster Station and serves the Summit Hills Pressure Zone. The reservoir has a re-circulating chlorination system which helps to maintain the chlorine residual level between 0.5 to 0.8 mg/L in the reservoir. The reservoir's drain discharges to the entrance of the reservoir site and the overflow discharge to a drainage on a hillside. The drain, overflow and air vent are screened.

Table 5: Active Potable Water Storage Reservoir Information				
Name	Type	Year Built	Capacity (gallons)	Comments
Chalk Mountain Reservoir	Concrete	1976	2,950,000	Last inspected in December 2016 and cleaned in 2012.
El Monte Reservoir	Welded Steel	2005	150,000	Last inspected in March 2013.
Pine Mountain Reservoir	Concrete	1960	1,530,000	Last inspect in March 2014 and cleaned in November 2010.
Random Oaks Reservoir	Concrete	1981	970,000	Last inspected and cleaned in March 2015. Installed low rise aluminum dome to replace the wood roof and concrete columns.
Rojo Reservoir	Welded Steel	2004	630,000	Last inspected in December 2016 and cleaned in March 2011.
San Carlos Reservoir	Welded Steel	1992	4,820,000	Last relined/recoated interior and exterior in February 2012 with new interior ladder. Last inspected and cleaned in February 2013.
San Marcos Reservoir	Concrete	1981	2,930,000	Last cleaned, re-lined/recoated in March 2008. Last inspected in March 2013.
Santa Ana Reservoir	Welded Steel	1980	2,980,000	Last cleaned in March 2011. Last inspected in December 2016.
Summit Hills Reservoir	Welded Steel	1980	90,000	Last relined/recoated interior and exterior in February 2012 with new interior ladder, vent and hatch. Drained, patched holidays with AquataPoxy and washout; low level of volatile organic chemicals detected. Last inspected in April 2015.

II.e Element 5 – Pumps, Pump Facilities, and Control

AMWC operates eight active booster pump facilities to maintain pressure in its domestic water distribution system. The facilities are located throughout AMWC's service areas. The booster pump stations are activated by distribution demand or reservoir levels. All the stations have a standby generator onsite or a connection to a portable generator in case of a power failure. AMWC can monitor all the stations through the SCADA system.

Cencero Booster Pump Station
The booster pump station was built in 1980 and was rebuilt in 2013. It has three Grundfos pumps; one pump is rated 7.5-hp and remaining two each at 25-hp. The 25-hp pumps are used alternately. The pumps can be used at the same time if required by demand. The pumps are located inside a small building in a rural/residential area. The booster pump station receives water from the Santa Ana Reservoir. It delivers water to the Cencero Pressure Zone.

Del Rio Booster Pump Station
The booster pump station was built in 2004 with three pumps. Two are 75-hp variable frequency drive (VFD) pumps; the third one is a 100-hp pump. The 75-hp pumps are capable of 460 gpm each. The pumps are alternately used to even out the usage of each pump. The pumps are located inside a building in a rural/residential area. The station receives water from the Main Pressure Zone and delivers water to the Santa Ana Pressure Zone and Reservoir.

El Verano Booster Pump Station
The booster pump station has three pumps: a 3-hp vertical pump, a 15-hp Peerless vertical turbine pump with a capacity of 120 gpm, and a 75-hp Grundfos split case with a capacity of 1,000 gpm for fire flow. The pumps are located inside a building in a residential area. The station receives water from the Main Pressure Zone and delivers water to the El Verano Boosted Pressure Zone. The

booster station pressurizes an onsite hydropneumatic tank for providing water to the homes located nearby.

Random Oaks Booster Pump Station
The booster pump station was built in 1980 in a rural/residential area at the Random Oaks Reservoir site. There are two 7.5-hp Berkeley end suction pumps in the station. Each has a capacity of 60 gpm. The pumps are located inside a building. They are set to operate alternately to even out their usage. The station receives water from the Random Oaks Reservoir. It delivers water to the Random Oaks Boosted Pressure Zone through a hydropneumatic tank. There are about eight service connections in the Random Oaks Boosted Pressure Zone.

San Gabriel Booster Pump Station
The booster pump station was built in 1995 in a rural/residential area. There are four 125-hp Peerless VFD pumps. Each pump is capable of 600 gpm. The pumps are located inside a building. The pumps are used alternately. The station receives water from the Main Pressure Zone and delivers water to the San Marcos Pressure Zone.

San Marcos Booster Pump Station
The booster pump station was built in 2006 in a rural/residential area. It has three 60-hp Fairbanks Morse vertical turbine pumps. Pumps one and two are equipped with variable frequency drives. Each pump is capable of 500 gpm. The pumps are located inside a building. They are operated alternately to even out the usage, but could be run at the same time. The station receives water from the San Marcos Reservoir and delivers water to the Summit Hills Pressure Zone.

Summit Hills Booster Pump Station
The booster pump station was built in 1980 in a rural/residential area. AMWC installed two new 20-hp Grundfos pumps in 2016. There is also a 60-hp VFD controlled pump for excess demand and fire flow. The pumps are located inside a building. The pumps are used alternately to even out usage. The station receives water from the Summit Hills Reservoir/Summit Hills Pressure Zone and delivers water to the Summit Hills Boosted Pressure Zone through a hydropneumatic tank.

Toloso Booster Pump Station
The booster pump station was built in 1982 in a rural/residential area. It has three pumps. The pumps are located either inside a building or inside a metal shed. The station receives water from the Main Pressure Zone and delivers water to the Toloso Boosted Pressure Zone. The 7.5-hp pump is used all the time while the 20-hp pump is used for meeting high demand. The 60-hp pump is used for fire flow only.

Table 6: Booster Pump Stations

Booster Pump Station Name	Number of Pump	Pump power (hp)	Capacity (gpm)	Receive Water from	Delivers Water to
Cencero	3	7.5, 25 & 25	30, 150, 150	Santa Ana Reservoir	Cencero Zone
Del Rio	3	75 & 75, 100	460 each	Main Pressure Zone	Santa Ana Zone
El Verano	3	3, 15, 75	30, 120, 1,000	Main Pressure Zone	El Verano Boosted Pressure Zone
Random Oaks	2	7.5 each	60 each	Random Oaks Reservoir	Random Oaks Boosted Pressure Zone
San Gabriel	4	125 each	600 each	Main Pressure Zone	San Marcos Zone
San Marcos	3	60 each	500 each	San Marcos Reservoir	Summit Hills Zone
Summit Hills	3	20, 20, 60	---	Summit Hills Reservoir	Summit Hills Booster

Table 6: Booster Pump Stations					
Booster Pump Station Name	Number of Pump	Pump power (hp)	Capacity (gpm)	Receive Water from	Delivers Water to
				& Pressure Zone	Pump Station
Toloso	3	7.5, 20 & 60	30, 120 & 400	Main Pressure Zone	Toloso Boosted Pressure Zone

II.f Element 6 – Monitoring, Reporting, and Data Verification

California laws and regulations require a public water system to routinely monitor its groundwater sources for general physical parameters, general minerals, inorganic chemicals, radiological chemicals, volatile organic chemicals (VOCs), non-volatile synthetic organic chemicals (SOCs), total coliform bacteria, and fecal coliform bacteria (*E. coli*).

A public water system is also 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.

II.f.1 Chemical Source Monitoring and Reporting

II.f.1.A Source Monitoring Schedules

The following tables show the previous monitoring dates, the monitoring frequencies and the next due dates for future monitoring for primary and secondary chemicals, general physicals and minerals of the source waters. AMWC was granted a waiver from most of the SOCs monitoring, except atrazine and simazine, for the active and standby wells. AMWC received a waiver from asbestos source sampling for groundwater wells in the 2010 Sanitary Survey. However, wells that are considered under the direct influence of surface water need to be sampled for asbestos every nine years.

Well 2A was sampled for color, odor and turbidity on September 4, 2014. The next sampling date will be in September 2017.

Well 2A was last sampled for hexavalent chromium on March 17, 2011 and the next sampling date was March 2014. The 2011 result for hexavalent chromium was the latest in DDW database. AMWC shall sample Well 2A for hexavalent chromium within 30 days as of the Sanitary Survey report and request its laboratory to electronically send the results for DDW. If the well was sampled for hexavalent chromium, AMWC shall request its laboratory to resend the results to DDW electronically.

Table 7A: Chemical Monitoring of Sources						
Source Name & PS Code	Sampling	General Physical & Minerals	Inorganic*	Radiological	VOCs	SOCs
Well 1B 4010002-050	Last	4/28/2016	4/28/2016	5/23/2017	4/28/2016	5/10/2016
	Frequency	3 Years	3 Years	3 Years	3 Years	9 years
	Next	April 2019	April 2019	May 2020	April 2019	May 2025
Well 2A 4010002-022	Last	4/7/2015	4/7/2015	9/7/2011	4/7/2015	4/16/2015
	Frequency	3 years	3 years	9 years	3 years	3 years
	Next	April 2018	April 2018	September 2020	April 2018	April 2018
Well 3A	Last	2/11/2016	2/11/2016	8/20/2013	2/11/2016	7/10/2014

Table 7A: Chemical Monitoring of Sources						
Source Name & PS Code	Sampling	General Physical & Minerals	Inorganic*	Radiological	VOCs	SOCs
4010002-023	Frequency	3 years	3 years	6 years	3 years	9 years
	Next	February 2019	February 2019	August 2019	February 2019	July 2023
Well 4 4010002-006	Last	5/3/2016	5/3/2016	5/19/2016	5/3/2016	10/27/2015
	Frequency	3 years	3 years	6 years	3 years	9 years
	Next	May 2019	May 2019	May 2022	May 2019	October 2024
Well 5 4010002-007	Last	7/5/2016	7/5/2016	7/5/2016	7/5/2016	7/10/2014
	Frequency	3 years	3 years	3 years	3 years	9 years
	Next	July 2019	July 2019	July 2019	July 2019	July 2023
Well 5A 4010002-015	Last	4/28/2016	4/28/2016	12/8/2016	4/28/2016	2/5/2015
	Frequency	3 years	3 years	3 years	3 years	9 years
	Next	April 2019	April 2019	December 2019	April 2019	February 2024
Well 6A 4010002-042	Last	5/16/2017	5/16/2017	4/28/2016	5/16/2017	5/8/2014
	Frequency	3 years	3 years	6 years	3 years	9 years
	Next	May 2020	May 2020	April 2022	May 2020	May 2023
Well 7 4010002-009	Last	7/28/2016	7/28/2016	5/23/2017	7/28/2016	10/14/2014
	Frequency	3 years	3 years	3 years	3 years	9 years
	Next	July 2019	July 2019	May 2020	July 2019	October 2023
Well 8A 4010002-044	Last	2/11/2016	2/11/2016	6/8/2017	2/11/2016	1/14/2014
	Frequency	3 years	3 years	9 years	3 years	9 years
	Next	February 2019	February 2019	June 2026	February 2019	January 2023
Well 9A 4010002-040	Last	7/28/2016	7/28/2016	7/21/2011	7/28/2016	5/27/2014
	Frequency	3 years	3 years	9 years	3 years	9 years
	Next	July 2019	July 2019	July 2020	July 2019	May 2023
Well 10 4010002-012	Last	7/5/2016	4/21/2015	1/12/2012	7/5/2016	10/14/2014
	Frequency	3 years	3 years	9 years	3 years	9 years
	Next	July 2019	April 2018	January 2021	July 2019	October 2023
Well 12 4010002-001	Last	4/28/2016	4/28/2016	8/20/2013	4/28/2016	2/5/2015
	Frequency	3 years	3 years	9 years	3 years	9 years
	Next	April 2019	April 2019	August 2022	April 2019	February 2024
Well 13A 4010002-020	Last	6/4/2015	6/4/2015	1/14/2010	6/4/2015	5/8/2015
	Frequency	3 years	3 years	9 years	3 years	9 years
	Next	June 2018	June 2018	January 2019	June 2018	May 2023
Well 16 4010002-016	Last	9/3/2015	9/3/2015	3/8/2012	9/3/2015	2/5/2015
	Frequency	3 years	3 years	9 years	3 years	9 years
	Next	September 2018	September 2018	March 2021	September 2018	February 2024
Well 19 4010002-018	Last	7/5/2016	7/5/2016	3/13/2012	7/5/2016	2/4/2014
	Frequency	3 years	3 years	9 years	3 years	9 years
	Next	July 2019	July 2019	March 2021	July 2019	February 2023
Well 25 4010002-053	Last	7/28/2016	7/28/2016	5/12/2016	7/28/2016	4/12/2011
	Frequency	3 years	3 years	3 years	3 years	9 years
	Next	July 2019	July 2019	May 2019	July 2019	April 2020
Well 26	Last	7/28/2016	7/28/2016	5/12/2016	7/28/2016	4/12/2011

Table 7A: Chemical Monitoring of Sources						
Source Name & PS Code	Sampling	General Physical & Minerals	Inorganic*	Radiological	VOCs	SOCs
4010002-054	Frequency	3 years	3 years	9 years	3 years	9 years
	Next	July 2019	July 2019	May 2025	July 2019	April 2020
Well 14 Standby 4010002-002	Last	9/8/2016	9/8/2016	1/14/2010	1/14/2010	4/16/2015
	Frequency	9 years	9 years	9 years	9 years	9 years
	Next	September 2025	September 2025	January 2019	January 2019	April 2024

*For Inorganics, see hexavalent chromium, perchlorate, nitrate and nitrite in Table 7B.

Table 7B: Chemical Monitoring of Sources					
Source Name & PS Code	Sampling	Nitrite (As N)	Nitrate (As N)	Perchlorate	Hexavalent Chromium
Well 1B 4010002-050	Last	4/28/2016	3/14/2017	4/28/2016	5/26/2016
	Frequency	3 Years	1 year	3 Years	3 Years
	Next	April 2019	March 2018	April 2019	May 2019
Well 2A 4010002-022	Last	4/7/2015	8/25/2016	4/7/2015	3/17/2011
	Frequency	3 years	1 year	3 years	3 years
	Next	April 2018	**August 2017**	April 2018	**Due March 2014**
Well 3A 4010002-23	Last	2/11/2016	3/14/2017	2/11/2016	5/26/2016
	Frequency	3 years	1 year	3 years	3 years
	Next	February 2019	March 2018	February 2019	May 2019
Well 4 4010002-006	Last	5/3/2016	3/14/2017	5/3/2016	5/26/2016
	Frequency	3 years	1 year	3 years	3 years
	Next	May 2019	March 2018	May 2019	May 2019
Well 5 4010002-007	Last	7/5/2016	2/14/2017	7/5/2016	7/5/2016
	Frequency	3 years	1 year	3 years	3 years
	Next	July 2019	February 2018	July 2019	July 2019
Well 5A 4010002-015	Last	4/28/2016	3/14/2017	4/28/2016	5/26/2016
	Frequency	3 years	1 year	3 years	3 years
	Next	April 2019	March 2018	April 2019	May 2019
Well 6A 4010002-042	Last	5/16/2017	5/16/2017	5/16/2017	2/10/2015
	Frequency	3 years	1 year	3 years	3 years
	Next	May 2020	May 2018	May 2020	February 2018
Well 7 4010002-009	Last	7/28/2016	7/28/2016	7/28/2016	2/5/2015
	Frequency	3 years	1 year	3 years	3 years
	Next	July 2019	July 2017	July 2019	February 2018
Well 8A 4010002-044	Last	2/11/2016	5/18/2017	2/11/2016	5/26/2016
	Frequency	3 years	1 year	3 years	3 years
	Next	February 2019	May 2018	February 2019	May 2019
Well 9A 4010002-040	Last	7/28/2016	7/28/2016	7/28/2016	2/5/2015
	Frequency	3 years	1 year	3 years	3 years
	Next	July 2019	July 2017	July 2019	February 2018
Well 10 4010002-012	Last	7/5/2016	7/5/2016	7/5/2016	7/5/2016
	Frequency	3 years	1 years	3 years	3 years

Table 7B: Chemical Monitoring of Sources					
Source Name & PS Code	Sampling	Nitrite (As N)	Nitrate (As N)	Perchlorate	Hexavalent Chromium
	Next	July 2019	July 2017	July 2019	July 2019
Well 12 4010002-001	Last	4/28/2016	5/23/2017	4/28/2016	2/5/2015
	Frequency	3 years	1 year	3 years	3 years
	Next	April 2019	May 2018	April 2019	February 2018
Well 13A 4010002-020	Last	6/4/2015	5/23/2017	6/4/2015	2/5/2015
	Frequency	3 years	1 years	3 years	3 years
	Next	June 2018	May 2018	June 2018	February 2018
Well 16 4010002-016	Last	9/3/2015	10/13/2016	9/3/2015	2/5/2015
	Frequency	3 years	1 year	3 years	3 years
	Next	September 2018	**October 2017**	September 2018	February 2018
Well 19 4010002-018	Last	7/5/2016	3/14/2017	7/5/2016	7/5/2016
	Frequency	3 years	1 year	3 years	3 years
	Next	July 2019	March 2018	July 2019	July 2019
Well 25 4010002-053	Last	7/28/2016	7/28/2016	7/28/2016	5/12/2016
	Frequency	3 years	1 year	3 years	3 years
	Next	July 2019	**July 2017**	July 2019	May 2019
Well 26 4010002-054	Last	7/28/2016	9/15/2016	7/28/2016	5/12/2016
	Frequency	3 years	1 year	3 years	3 years
	Next	July 2019	**September 2017**	July 2019	May 2019
Well 14 Standby 4010002-002	Last	9/8/2016	9/8/2016	9/8/2016	9/8/2016
	Frequency	9 years	1 year	9 years	9 years
	Next	September 2025	**September 2017**	September 2025	September 2025

II.f.1.B Source Monitoring Results

General Physical and Minerals (Secondary Drinking Water Standard)
AMWC's active and standby wells met the general physical and minerals standards according to the latest sampling results, except Wells 6A and Well 12. **Well 2A exceeded manganese secondary MCL. Well 6A exceeded iron secondary MCL with a result of 310 micrograms per liter (ug/L) according to the 2014 monitoring results. Well 12 exceeded the secondary standards for color (27 color units), iron (820 ug/L), odor (5 threshold odor units) and turbidity (6.50 NTUs) per the 2016 monitoring results. Currently AMWC is not using Wells 2A, 6A and 12; AMWC does not plan to use these three wells in the next several years. If Wells 2A, 6A and/or 12 are put back online for regular use, AMWC shall initiate quarterly manganese monitoring for Well 2A; quarterly iron sampling for Well 6; and quarterly color, iron, odor and turbidity sampling for Well 12. After one year of quarterly monitoring in which all the monitoring results are under the secondary MCLs and the results do not indicate any trend toward exceeding the secondary MCL, AMWC may request the DDW for a reduced monitoring frequency.**

The following two tables have the latest general physical and minerals sampling results from AMWC's active and standby wells. However, the results for Well 6A were from May 2014; Wells 7, 9A, 25 and 26 were from August 2013; and Well 14 were from September 2007. These six wells are all overdue for their next round of sampling for general physical and minerals.

Table 8A: General Physical and Minerals

	MCL	DLR	Well 1B	Well 2A	Well 3A	Well 4	Well 5	Well 5A	Well 6A	Well 7	Well 8A
Aggressive Index‡			12.06	12.23	11.66	11.82	12.25	12.11	12.17	12.36	11.74
Bicarbonate Alkalinity (mg/L) ‡			310	460.0	390	210	410	380	320	350	240
Calcium (mg/L) ‡			91	110.0	86	49	110	100	86	120	48
Carbonated Alkalinity (mg/L) ‡			ND*	ND	ND	ND	ND	ND	ND	ND	ND
Hydroxide Alkalinity (mg/L) ‡			ND	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium (mg/L) ‡			40	48.0	45	25	50	48	42	41	28
pH‡			7.3	7.2	6.8	7.5	7.6	7.2	7.6	7.4	7.4
Sodium (mg/L) ‡			44	160.0	110	27	120	120	36	40	28
Total Hardness as $CaCO_3$ (mg/L) ‡			390	460.0	400	410	480	460	390	450	240
Aluminum (mg/L)	0.2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Color (Units)	15		ND	ND	ND	ND	6	ND	5	ND	3
Copper (mg/L)	1.0	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Foaming Agents (MBAS) (mg/L)	0.5		ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron (mg/L)	0.3	0.1	ND	0.1	ND	ND	ND	ND	**0.31**	ND	ND
Manganese (mg/L)	0.05	0.02	ND	**0.16**	ND	ND	0.036	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE) (mg/L)*	0.005		ND	ND	ND	ND	ND	ND	ND	ND	ND
Odor – Threshold (Units) at 60° Celsius	3	1	1	1.0	1	1	1	1	ND	1	2
Silver (mg/L)	0.1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiobencarb (mg/L)†	0.001		ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidity (Units)	5	0.1	ND	0.14	ND	ND	ND	ND	1.48	ND	ND
Zinc (mg/L)	5.0	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Dissolved Solids (mg/L)	1000*		500	960.0	380	410	830	820	620	620	390
Specific Conductance (uS/cm)	1,600*		920	1600.0	1,200	520	1,400	1,400	920	960	570
Chloride (mg/L)	500*		42	240.0	33	38	170	160	68	72	18
Sulfate (mg/L)	500*	0.5	140	160.0	130	77	150	150	130	140	83

*The values for Total Dissolved Solids, Specific Conductance, Chloride, and Sulfate are upper values of MCL ranges for which No fixed MCL has been established.
†Thiobencarb and MTBE were waived from monitoring.
‡These constituents do not have any MCLs or DLRs.
MCL = maximum contaminant levels, DLR = Detection Limits for Purposes of Reporting
ND = Not Detected. The BDLs for the General Physical and Minerals are set at or below the DLR levels.

Table 8B: General Physical and Minerals

	MCL	DLR	Well 9A	Well 10	Well 12	Well 13A	Well 16	Well 19	Well 25	Well 26	Well 14
Aggressive Index			11.93	12.1	12.16	12.14	11.92	12.04	11.98	12.18	11.94
Bicarbonate Alkalinity (mg/L)			240	280	380	280	190	230	260	300	240
Calcium (mg/L)			62	69	57	69	38	72	67	84	62

Table 8B: General Physical and Minerals											
	MCL	DLR	Well 9A	Well 10	Well 12	Well 13A	Well 16	Well 19	Well 25	Well 26	Well 14
Carbonated Alkalinity (mg/L)			ND	ND	ND	ND	ND	ND	ND	ND	ND
Hydroxide Alkalinity (mg/L)			ND	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium (mg/L)			23	29	29	34	21	36	26	31	29
pH			7.5	7.6	7.5	7.6	7.7	7.4	7.4	7.4	8.5
Sodium (mg/L)			27	33	90	36	19	33	27	30	10
Total Hardness as $CaCO_3$ (mg/L)			250	290	260	310	180	330	280	340	270
Aluminum (mg/L)	0.2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Color (Units)	15		ND	5	**27**	ND	ND	ND	ND	ND	ND
Copper (mg/L)	1.0	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Foaming Agents (MBAS) (mg/L)	0.5		ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron (mg/L)	0.3	0.1	ND	ND	**0.820**	ND	ND	ND	ND	ND	0.27
Manganese (mg/L)	0.05	0.02	ND	ND	0.039	33	ND	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE) (mg/L)	0.005		ND	ND	ND	ND	ND	ND	ND	ND	ND
Odor – Threshold (Units) at 60° Celsius	3	1	2	1	**5**	1	1	1	1	2	1
Silver (mg/L)	0.1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiobencarb (mg/L)	0.001		ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidity (Units)	5	0.1	ND	ND	**6.50**	ND	ND	ND	ND	ND	1.46
Zinc (mg/L)	5.0	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Dissolved Solids (mg/L)	1000*		340	430	510	430	400	360	390	450	320
Specific Conductance (uS/cm)	1,600		560	680	850	690	420	730	600	740	540
Chloride (mg/L)	500		23	34	42	31	50	28	26	40	9.0
Sulfate (mg/L)	500	0.5	67	88	84	94	54	150	71	96	74

Inorganic Chemicals

AMWC's wells meet the inorganics drinking water standards. AMWC shall continue to monitor the active wells for inorganic chemicals according to the monitoring schedule. AMWC was granted a waiver for asbestos sampling requirements for its active and standby wells. The following two tables have the latest inorganic chemicals sampling results from AMWC's active and standby wells. However, the results for Well 6A were from May 2014.

Table 9A: Inorganic Chemicals											
	MCL (mg/L)	DLR (mg/L)	Well 1B	Well 2A	Well 3A	Well 4	Well 5	Well 5A	Well 6A	Well 7	Well 8A
Aluminum	1.	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	0.006	0.006	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.010	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND
Asbestos*	7 MFL*	0.2 MFL > 10 um*	---	---	---	---	---	---	---	---	---
Barium	1.	0.1	ND	0.13	ND	ND	0.11	0.11	ND	ND	ND

Table 9A: Inorganic Chemicals

	MCL (mg/L)	DLR (mg/L)	Well 1B	Well 2A	Well 3A	Well 4	Well 5	Well 5A	Well 6A	Well 7	Well 8A
Beryllium	0.004	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.005	0.001	ND	0.0016	ND	ND	ND	ND	ND	ND	ND
Chromium (total)	0.05	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyanide	0.15	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoride	2.0	0.1	0.24	0.31	0.18	0.36	0.36	0.34	0.21	0.16	0.22
Hexavalent Chromium	0.010	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead		0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.002	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	0.1	0.01	ND	0.018	ND	ND	ND	0.01	ND	ND	ND
Nitrate (as N)	10.	0.4	0.57	ND	1.3	3.7	1.8	2.6	1.2	1.7	ND
Nitrate + Nitrite (sum as N)	10.	---	ND	0.66	1.1	0.77	0.75	0.88	1.1	1.7	ND
Nitrite	1.	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	0.006	0.004	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	0.05	0.005	ND	ND	ND	0.0065	ND	0.0054	ND	0.0065	ND
Thallium	0.002	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND

*MFL = million fibers per liter, MCL for fibers exceeding 10 micro-meter (um) in length.

Table 9B: Inorganic Chemicals

	MCL (mg/L)	DLR (mg/L)	Well 9A	Well 10	Well 12	Well 13A	Well 16	Well 19	Well 25	Well 26	Well 14
Aluminum	1.	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	0.006	0.006	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.010	0.002	ND	0.0023	ND	0.0024	ND	ND	ND	ND	ND
Asbestos*	7 MFL*	0.2 MFL > 10 um*	---	---	---	---	---	---	---	---	---
Barium	1.	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	0.004	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.005	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium (total)	0.05	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyanide	0.15	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoride	2.0	0.1	0.18	0.18	0.18	0.12	0.31	0.31	0.19	0.18	0.11
Hexavalent Chromium	0.010	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead		0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.002	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	0.1	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate (as N)	10.	0.4	0.98	1.1	ND	0.86	ND	2.3	0.91	1.1	0.58
Nitrate + Nitrite (sum as N)	10.	---	0.98	1.1	ND	0.86	ND	0.97	0.91	1.3	0.58
Nitrite	1.	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	0.006	0.004	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	0.05	0.005	ND	ND	ND	0.0061	ND	0.01	ND	0.0058	ND
Thallium	0.002	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND

Radioactivity

The following table has the latest radiological activities monitoring results for AMWC's wells. The active and standby wells' latest sampling results met radiological activity standards.

Table 10: Radiological Results					
	GA†	GA CE†	Radium 226	Radium 228	Uranium
MCL (pCi/L)	15	---	Ra-226 + Ra-228 = 5		20
DLR (pCi/L)	3	---	1	1	1
Well 1B	3.0	2.9	**GA+0.84xCE-Ur**: ¥ 0.213	0.000	**GA+0.84xCE:** † 2.5
Well 2A	ND	2.7	No further action is required for this sampling event	No further action is required for this sampling event	No further action is required for this sampling event
Well 3A	4.6	2.5	4.6+0.84x2.5-5.3=1.4<5 No further action is required for this sampling event	ND	5.3
Well 4	4.7	2.3	0.033	0.082	3.2
Well 5	**12**	5.4	0.035	0.060	11
Well 5A	**15**	4.0	ND*	ND	13
Well 6A	3.4	3.5	ND	ND	1.9
Well 7	ND	3.5	**0.290**	0.00	2.4
Well 8A	ND	2.6	**0.1**	0.551	2.1
Well 9A	ND	2.4	No further action is required for this sampling event	No further action is required for this sampling event	No further action is required for this sampling event
Well 10	ND	2.1	No further action is required for this sampling event	No further action is required for this sampling event	No further action is required for this sampling event
Well 12	3	2.5	3+0.84x2.5=5 No further action is required for this sampling event	No further action is required for this sampling event	ND
Well 13A	ND	1.4	No further action is required for this sampling event	No further action is required for this sampling event	No further action is required for this sampling event
Well 16	ND	1.7	No further action is required for this sampling event	No further action is required for this sampling event	No further action is required for this sampling event
Well 19	ND	2.4	No further action is required for this sampling event	No further action is required for this sampling event	No further action is required for this sampling event
Well 25	**9.5**	3.0	ND	ND	ND
Well 26	ND	2.8	No further action is required for this sampling event	No further action is required for this sampling event	No further action is required for this sampling event
Well 14	ND	1.7	No further action is required for this sampling event	No further action is required for this sampling event	No further action is required for this sampling event

*ND = not detected

†GA+0.84xCE is used to find out if further sampling is required for uranium. If the result is greater than 5, then uranium sampling is required. GA=Gross Alpha result; CE is the gross alpha counting error.

¥GA+0.84xCE-Ur is used to determine if further sampling for radium isotopes. . If the result is greater than 5, then radium 226 and 228 samplings are required. Ur is uranium concentration.

Volatile Organic Chemicals

The most recent sampling results showed AMWC's active and standby wells comply with VOCs MCLs (all the results were non-detect). AMWC shall continue to monitor its wells for VOCs according to their respective monitoring schedules.

In the 2015 Consumer Confidence Report, AMWC reported that total xylenes were detected at 1.9 micrograms per liter in the water it delivered to its customer. AMWC stated that the total xylenes were detected from the San Carlos and Summit Hills Reservoirs. AMWC's chief operator said that those two reservoirs were recoated back in 2013 with 100 percent solids Devoe coating that conformed to AWWA Standards D102-97 Inside Coating system No. 2. After the initial soaking and VOCs samples were collected and total xylenes was still present. AMWC's chief operator said samples taken in January 2017 from the two reservoirs showed no detection for total xylenes.

Non-Volatile Synthetic Organic Chemicals (SOCs)
DDW has previously granted waivers for SOCs sampling requirements. Currently, AMWC is required to just test for atrazine and simazine for the active and standby wells. The latest monitoring results for the wells were non-detect. AMWC shall continue to monitor its sources for SOCs according to the monitoring schedule.

Raw Water Bacteriological Monitoring and Reporting

AMWC has a Groundwater Rule Sampling Plan (GWRSP) with DDW which is dated May 16, 2012. AMWC conducts monthly sampling of the active wells when they are in use. In 2015 and 2016, AMWC did not sample Wells 6A, 12 and 14 for bacteriological activities. The following table has the bacteriological activity sampling results from AMWC's sources since 2015. The wells with no sampling results are excluded from the table.

Table 11: Source Bacteriological Activity Monitoring Results

2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Well 1B		1-0-0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0					
Well 3A		1-0-0										
Well 4								148.3, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0
Well 5							<1.0, <1.0	<1.0, <1.0	<1.0, <1.0			
Well 5A		1-0-0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0						
Well 7	<1.0, <1.0		1-0-0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0			<1.0, <1.0		
Well 8A	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0						
Well 9A	<1.0, <1.0		<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0			<1.0, <1.0		
Well 10	<1.0, <1.0			<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0			
Well 13A	<1.0, <1.0	<1.0, <1.0	23.1, <1.0	10.9, <1.0	<1.0, <1.0	<1.0, <1.0	1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	9.5, <1.0
Well 16									<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0
Well 19							<1.0, <1.0	<1.0, <1.0	<1.0, <1.0			
Well 25							<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0
Well 26	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0
2016	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Well 1B		<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0		
Well 3A		<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	1-0-0	1-0-0					
Well 4	<1.0, <1.0		<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0	
Well 5						1-0-0	1-0-0	1-0-0	1-0-0	1-0-0	2-0-0	1-0-0
Well 5A			<1.0, <1.0	<1.0, <1.0	<1.0, <1.0	1-0-0						

Table 11: Source Bacteriological Activity Monitoring Results												
Well 7							1-0-0			1-0-0		
Well 8A		<1.0, <1.0		<1.0, <1.0	<1.0, <1.0	1-0-0	1-0-0	1-0-0	1-0-0		1-0-0	1-0-0
Well 9A							1-0-0			1-0-0		
Well 10						<1.0, <1.0	<1.0, <1.0			<1.0, <1.0		
Well 13A	60.1, <1.0	1, 1.0	114.5, <1.0		<1.0, <1.0	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0	1-1-0
Well 16	<1.0, <1.0	<1.0, <1.0	3.1, <1.0		<1.0, <1.0	1-0-0	1-0-0	1-0-0	1-0-0			
Well 19					<1.0, <1.0	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0		1-0-0
Well 25	<1.0, <1.0				<1.0, <1.0	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0	
Well 26	<1.0, <1.0			<1.0, <1.0	<1.0, <1.0	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0	
2017	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Well 1B	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0							
Well 3A	2-0-0	1-0-0	1-0-0	1-0-0	1-0-0							
Well 4	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0							
Well 5												
Well 5A	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0							
Well 7					1-0-0							
Well 8A		1-0-0	1-0-0	1-0-0	1-0-0							
Well 10					1-0-0							
Well 13A	1-0-0	1-1-0	1-0-0	1-0-0	1-0-0							
Well 16	3-1-0	1-0-0	1-0-0	1-0-0	1-0-0							
Well 19	1-0-0	1-0-0	1-0-0	1-0-0	1-0-0							
Well 25					1-0-0							
Well 26				1-0-0	1-0-0							

Key: # of samples collected - # of total coliform positive results - # of *E. coli* positive results
The numbers are MPN/100mL analytical results for total coliform and *E. Coli*.

II.f.2 Distribution System Monitoring and Reporting

II.f.2.A Distribution System Monitoring Schedule

The Aggressive Index (AI) values for AMWC's active wells are above 11.5 (with a range of 11.66 and 12.32) and not considered corrosive to asbestos cement pipes. **Therefore, AMWC does not have to take any asbestos samples in its distribution systems.**

Lead and copper samples were last taken in July of 2016. AMWC samples its distribution system for lead and copper annually. The next round of sampling is due in the summer

months of 2017. AMWC monitors the disinfection byproducts in its distribution systems quarterly. The monthly chlorine residual samples are taken along with the bacteriological samples.

Table 12: Distribution System Monitoring		
Site Name & PS Code	HAA5*	TTHMs*
STG2 – 621 El Monte & San Lucas 4010002-055	February, May, August and November	February, May, August and November
STG2 – Smiley Place & Listowell4010002-056	February, May, August and November	February, May, August and November
STG2 – San Palo Road 4010002-057	February, May, August and November	February, May, August and November
STG2 – 14405 Santa Lucia Road 4010002-058	February, May, August and November	February, May, August and November
STG2 – 11465 Santa Lucia Road 4010002-059	February, May, August and November	February, May, August and November
STG2 – Rojo Court 4010002-060	February, May, August and November	February, May, August and November

*HAA5 = Haloacetic Acids (5), TTHMs = Total Trihalomethanes

II.f.2.B Distribution System Monitoring Results

Disinfection Byproducts Monitoring Results

AMWC currently complies with the Stage 2 Disinfectants/Disinfection Byproducts (DBPs) Rule Monitoring. AMWC collects quarterly Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5) sample sets from its distribution system for testing to comply with monitoring requirements for DBPs. The quarterly samples are taken in February, May, August and November. AMWC complies with the DBPs requirements. The results since 2015 showed that the highest HAA5 and TTHMs concentrations were found at the Rojo Court sampling location, with TTHMs reached 0.0688 mg/L. The following table has the quarterly monitoring results for HAA5 and TTHMs since 2015.

Table 13: HAA5 and TTHMs Results											
Sources	DBPs (mg/L)	2015				2016				2017	
		Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May
4010002-055	HAA5	0.0058	0.0073	0.0063	0.0119	0.0065	0.0138	0.0158	0.0165	0.0138	0.0233
	TTHMs	0.0351	0.0245	0.0278	0.0321	0.0213	0.0453	0.0502	0.044	0.0391	0.0612
4010002-056	HAA5	0.006	0.0086	0.0065	0.0096	0.0084	0.0181	0.0106	0.0109	0.0113	0.0178
	TTHMs	0.0306	0.0332	0.0361	0.0309	0.0255	0.0637	0.0481	0.0447	0.011	0.0556
4010002-057	HAA5	0.0055	0.0077	0.0078	0.0088	0.0059	0.0125	0.0101	0.0081	0.0114	0.0149
	TTHMs	0.0303	0.0316	0.0353	0.0356	0.0227	0.0544	0.0474	0.0376	0.0496	0.0546
4010002-058	HAA5	0.0038	0.0042	0.0071	0.0092	0.0077	0.0118	0.0058	0.0045	0.0114	0.009
	TTHMs	0.0253	0.0167	0.0336	0.0357	0.0271	0.0495	0.0276	0.0278	0.0443	0.0387
4010002-059	HAA5	0.0036	0.003	0.0063	0.0048	0.007	0.0121	0.006	0.0059	0.0114	0.0173
	TTHMs	0.023	0.0145	0.0258	0.0218	0.0216	0.0465	0.0306	0.0275	0.0456	0.0641
4010002-060	HAA5	0.0148	0.0167	0.0186	0.0179	0.0181	0.0262	0.0222	0.0164	0.0164	0.0272
	TTHMs	0.0466	0.0407	0.0501	0.0449	0.0402	0.0654	0.0688	0.0501	0.0545	0.063

HAA5 MCL = 0.060 mg/L, TTHMs MCL = 0.080 mg/L.

Chlorine Residual Monitoring

To comply with the maximum residual disinfectant level of 4.0 mg/L for chlorine residual monitoring, AMWC monitors its distribution systems for residual chlorine concentration. It collects eight weekly samples from 24 sampling sites, along with the bacteriological samples, to analyze for the chlorine residual levels. The sampling sites are representative of the water throughout AMWC's distribution system. The following table has the 2014 to present average monthly results for the chlorine residual levels from AMWC's distribution system. AMWC has been meeting the chlorine residual requirements according to data reviewed since 2014.

Table 14: Distribution Chlorine Residuals Results (mg/L)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	0.80	0.78	0.88	0.83	0.94	0.83	0.90	0.71	0.92	0.88	0.91	0.96
2015	0.96	0.83	0.81	0.94	0.88	0.95	0.9	0.83	0.9	0.92	0.95	0.88
2016	0.95	0.86	0.79	0.83	0.86	0.84	0.84	0.89	0.83	0.86	0.83	0.85
2017	0.80	0.75	0.75									

Lead and Copper Results

For compliance with the Lead and Copper Rule (LCR), AMWC collects and tests 60 LCR samples from its distribution system annually. Recent results are summarized Table 15. The lead and copper 90th percentile results were under the action level for samples taken in 2013, 2014, 2015 and 2016. AMWC notified its customers of the LCR results.

Table 15: Lead and Copper Monitoring of Distribution System					
Sampling Date	# of Samples	90th% Lead (mg/l)		90th% Copper (mg/l)	
		Action Level	0.015	Action Level	1.3
		DLR	0.005	DLR	0.050
June 13, 2013	62	<0.005		**1.6**	
December 18, 2013	62	<0.005		1.1	
June 17, 2014	60	<0.005		1.4	
June 17, 2015	62	<0.005		**1.9**	
December 16, 2015	60	<0.005		0.95	
July 5, 2016	60	<0.005		**1.6**	

II.f.3 Bacteriological Monitoring and Reporting

AMWC has a Total Coliform Sample Siting Plan (TCSSP) with DDW dated May 15, 2012. According to the TCSSP, AMWC conducts weekly monitoring of its distribution system for bacteriological activity and takes eight samples from the distribution system per week. Table 16 summarizes the number of samples collected each month, the number of samples tested positive for total coliform bacteria and for *E. coli* from the distribution system. In December 2014, one distribution sample was tested positive for total coliform; the repeat samples were negative for total coliform and *E. Coli*.

Table 16: Bacteriological Monitoring (Total Coliform and *E. coli*)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	40-0-0	32-0-0	32-0-0	40-0-0	32-0-0	32-0-0	40-0-0	32-0-0	40-0-0	32-0-0	32-0-0	45-1-0
2015	32-0-0	32-0-0	40-0-0	32-0-0	32-0-0	40-0-0	32-0-0	32-0-0	40-0-0	32-0-0	32-0-0	40-0-0

Table 16: Bacteriological Monitoring (Total Coliform and *E. coli*)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	32-0-0	32-0-0	40-0-0	32-0-0	40-0-0	32-0-0	32-0-0	40-0-0	32-0-0	32-0-0	40-0-0	32-0-0
2017	40-0-0	32-0-0	32-0-0	32-0-0	40-0-0							

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

II.g Element 7 – System Management and Operations

AMWC is a community public water system. Mr. John Neil is the General Manager. Mr. Michael S. Stephens is the Chief Operator and water quality contact.

DDW has a copy of AMWC's Emergency Notification Plan (ENP) on file which is dated June 21, 2017. AMWC submitted its 2016 Annual Report to DDW through the Electronic Annual Reporting System. AMWC distributed a copy of its 2015 Consumer Confidence Report (CCR) to its customers. It submitted a copy of the CCR on May 13, 2016, through the online Annual Report system. DDW received a copy of the CCR Certificate Form on August 31, 2016. DDW has reviewed and commented on AMWC's 2016 CCR back on March 27, 2017.

AMWC reported and investigated 334 distribution system problems in 2016. The majority of the problems were service connection breaks or leaks (about 313), 13 were about main breaks and eight were about water outages. AMWC received and investigated 47 complaints from its customers in 2016. Nine of the complaints were related to taste and odor; seven were regarding water color which were caused by sediments in the distribution mains; four were about turbidity caused by air in the mains; 25 were related to water system pressure; one was about waterborne illnesses in which a customer is concerned about her on-going illness; and one was about sand in water. AMWC reported in the 2016 Annual Report that the wells' static water levels are recovering.

II.h Element 8 – Operator Compliance with State Requirements

AMWC is classified as a Distribution 4 (D4) and Treatment 2 (T2) water system. Mr. Stephens is the chief operator. He is a D5 and T4 certified water operator. Mr. David Clark is the operator for the distribution system and he is a D5 and T2 certified water operator.

Table 17: Operator Certifications							
	Distribution				Treatment		
Name	Grade	Operator Number	Expiration Date		Grade	Operator Number	Expiration Date
Andrew Broster	4	28856	6/1/2018				
David Clark	5	8210	10/1/2018		2	21928	**11/1/2017**
Matthew Cook	4	38467	12/1/2019		2	34910	1/1/2019
Colton Cruzat	4	27015	11/1/2019		3	26644	12/1/2019
John Dalton	3	45644	11/1/2019				
Jason Fazio	3	46138	1/1/2020				
Joshua Lancaster	4	35169	9/1/2018		3	30831	5/1/2020
Joseph Martines	4	28858	**11/1/2017**		2	27003	8/1/2018
John Neil	4	15475	4/1/2020		2	24140	7/1/2019
Henryk New	4	14375	7/1/2018		2	20727	11/1/2019
Brent Rucker	3	14618	5/1/2019				
Michael Stephens	5	7524	5/1/2020		4	18918	1/1/2020
Jason Straeck	4	30681	4/1/2020		2	27379	2/1/2018

Table 17: Operator Certifications							
	Distribution				Treatment		
Name	Grade	Operator Number	Expiration Date		Grade	Operator Number	Expiration Date
Matthew Sytsma	5	23706	6/1/2019		4	26246	**11/1/2017**
Calvin Thompson III	4	36291	5/1/2019		2	31156	7/1/2018

III. CONCLUSION

The review of AMWC's reports and routine water quality monitoring results indicates AMWC's source and treated potable water meets all the applicable primary maximum contaminant levels. AMWC's potable water also meets the secondary MCLs, except for iron for Wells 6; color, iron, odor and turbidity for Well 12. AMWC shall sample its active and standby groundwater wells according to their respective sampling schedules and dates. Under normal circumstance, AMWC is able to provide potable water to its customers that meet the California drinking water standards.

A site inspection of AMWC's wells, storage tanks, distribution system and water quality sampling sites shows AMWC manages its system properly and according to the California drinking water laws and regulations.