

Mammoth Community Water District

Annual Water Conservation Program Report

September 2017

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1.0 INTRODUCTION

The purpose of this Annual Water Conservation Program Report is to fulfill the requirements of a Settlement Agreement, dated July 15, 2013, between the Mammoth Community Water District (MCWD), California Trout, and California Department of Fish and Wildlife. In 2014, MCWD completed a Conservation Plan pursuant to the Agreement. An annual report on the status of the Water Conservation Plan is required for 10 consecutive years following the publication of the Conservation Program Plan. This report is the third annual report in the 10-year series. As provided in the Agreement, the annual report will:

1. Describe the implementation of the MCWD Water Conservation Program, and to the extent applicable and feasible,
2. Apply the California Urban Water Conservation Council's (CUWCC) standards and metrics for measuring implementation and explains variances, and
3. Assess the need for future revisions to the conservation program.

The report is organized to include the implementation and documentation requirements from the CUWCC MOU, Exhibit 1, BMP Definitions, Schedules and Requirements. Text from the CUWCC MOU is shown as gray italic text with responses from MCWD in black non-italicized text. Conservation activities described in this report occurred during fiscal year (FY) 2017 (April 1, 2016 to March 31, 2017) unless noted as calendar year (CY).

2.0 MCWD CONSERVATION ACTIVITIES AND HIGHLIGHTS

MCWD is committed to reducing water demand on an ongoing basis by keeping infrastructure losses low, implementing new technologies that improve water efficiencies, and working with customers to incentivize implementation of water conservation practices.

MCWD was effective in reducing losses and customer water consumption this past year. Severe water shortage restrictions, ongoing infrastructure improvements to reduce leaks and improve accuracy of meter reads, the ability to view the previous day's hourly water usage for all accounts, and expedited enforcement procedures resulted in significant reductions in the inefficient use of water.

In CY 2016, water demand was significantly less when compared to CY 2013¹ by over 155 million gallons or 476 acre-feet. These savings are the result of working to build a cooperative relationship between MCWD and its customers during the multiyear drought.

In April 2016, the Mammoth Pass snow water content (SWC) was measured as 93% of normal. Although the SWC was nearly normal, the MCWD Board of Directors continued Level 3 Water Shortage Restrictions to allow the production well aquifers an opportunity to recharge. Level 3 Water Shortage Restrictions limit irrigation to two days a week and restricts irrigation to 8 hours a day. In comparison, permanent water conservation regulations during non-shortage years, allows irrigation three days a week with expanded hours that provide 51 hours of weekly irrigation. After receiving nearly normal precipitation, customers continued to show care in their irrigation practices, but the level of water

¹ CY 2013 is used as a reference point for the effectiveness of conservation measures by the State of California.

conservation was reduced from the severe conditions of the drought. Compared to CY 2015, water usage increased by 72 million gallons (221 acre-feet).

Water conservation priorities recommended in last year's Annual Water Conservation Report that are not included in CUWCC BMPs are presented below with a status update.

1. Complete development of a customer interface to access water usage data.

Status: An online customer portal went live on June 30, 2016. The program, WaterSmart, provides reporting features that greatly enhance MCWD's ability to enforce water conservation regulations and notify customers of potential leaks. High usage and leak alerts, recommendations for reducing water usage, and usage comparisons with similar properties are available to customers that register for the WaterSmart customer portal program. In addition, property managers may, with account holder's permission, access WaterSmart and track water usage and receive the high use and leak alerts for their clients. The reporting features and direct link with property managers has reduced staff time devoted to tracking violations, leaks, and contacting property managers regarding these issues.

2. Installation of a California Irrigation Management Information System (CIMIS) station.

MCWD would like to site a CIMIS station in the Mammoth Lakes area. A station would provide daily irrigation requirements and allow irrigation controllers to irrigate accordingly. The proper siting of a station limits the available locations to two. To facilitate working with landowners, the CA Department of Water Resources (DWR) has stepped in to help coordinate siting the CIMIS station. Unfortunately, no progress by DWR has been made on this project.

3. Evaluate the commercial, industrial, and institutional customer class for potential programs to reduce water usage.

MCWD did not make progress on this recommendation. This group of customers is highly heterogeneous and meters typically serve multiple types of customer classes, e.g. combined residential, food service, and retail. As the State develops guidelines for this customer sector, MCWD will incorporate those recommendations or requirements into the Code Book and conservation program.

3.0 UTILITY OPERATIONS PROGRAMS

The following water conservation program elements are arranged according to the CUWCC Best Management Practices contained in Exhibit 1 of the MOU between CUWCC and their signatories as updated January 2016.

3.1 Conservation Coordinator

CUWCC Implementation

Designate a person as the agency's responsible conservation coordinator for program management, tracking, planning, and reporting on BMP implementation.

CUWCC Coverage Requirements

Staff and maintain the position of trained conservation coordinator, or equivalent consulting support, and provide that function with the necessary resources to implement BMPs.

CUWCC Documentation Requirement:

Provide the contact information for the conservation coordinator, or consultant assigned, and verification that the position is responsible for implementing the tasks.

The District has continued to maintain a staff position to promote and implement water conservation programs for at least 16 years. MCWD combines the duties of the position with other environmental and regulatory tasks due to the relatively small size of the customer base. In 2013, the District developed and filled a permanent position to provide part-time, year-round assistance to the water conservation program. The Water Conservation Program receives an annual budget of approximately \$120,000, excluding personnel costs, to oversee a wide-range of activities as described in this plan. The majority of these funds support the water-efficient fixture rebate program. An additional \$24,000 from the general fund is budgeted annually for advertising, community outreach and printing of conservation messages.

Contact information for the Water Conservation Program Coordinator:

Irene Yamashita
(760) 934-2596 ext. 314
P.O. Box 597
Mammoth Lakes, CA 93546
iyamashita@mcwd.dst.ca.us

A job description for this position is available from the Personnel Department upon request.

CUWCC Water Savings Assumptions

CUWCC does not require quantification of water savings for this BMP.

3.2 Water Waste Prevention

CUWCC Implementation

a) *New development:*

Enact, enforce, or support legislation, regulations, ordinances, or terms of service that (1) prohibit water waste such as, but not limited to: single-pass cooling systems; conveyer and in-bay vehicle wash and commercial laundry systems which do not reuse water; non-recirculating decorative water fountains and (2) address irrigation, landscape, and industrial, commercial and other design inefficiencies.

b) *Existing users:*

Enact, enforce, or support legislation, regulations, ordinances, or terms of service that prohibit water waste such as, but not limited to: landscape and irrigation inefficiencies, commercial or industrial inefficiencies, and other misuses of water.

c) *Water shortage measures:*

Enact, enforce, or support legislation, regulations, ordinances, or terms of service that facilitate implementation of water shortage response measures.

CUWCC Documentation Requirement:

Provide the following:

- a) A description of, or electronic link to, any ordinances or terms of service adopted by water agency to meet the requirements of this BMP.*

In May 2016, the District updated the section of the Code Book related to water waste prohibitions, water shortage restrictions and enforcement of the regulations. The update decreased the weekly hours of allowed irrigation under Levels 1-3 Water Shortage Conditions; allows MCWD to develop a water budget for a customer with a meter that is mixed (reads both indoor and outdoor usage) if water waste is observed, and reduces the percentage an irrigation budget can be exceeded under several conservation restrictions, in addition to several other less significant changes.

The water regulation and enforcement portion of the Code Book may be accessed at http://www.mcwd.dst.ca.us/assets/code_ch12.pdf. Exemptions from the regulations are identified in the District's Code Book.

- b) A description of or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies with the water agency's service area.*

MCWD checks for water efficient fixtures when conducting inspections for water connection permits in accordance with the California Plumbing Code (CPC). The CPC does not apply to remodel projects, so MCWD offers incentives for remodel projects to install water efficient fixtures throughout the building. A project may change all the showerheads and toilets in the building to CPC standards to reduce the fixture count to a number that eliminates the need to install a larger and more costly water meter and the replacements may be eligible for MCWD water efficiency rebates. (The fixture count is based on the amount of water a fixture uses.) The construction community and homeowners have appreciated this consideration to provide an avenue to potentially avoid the cost of a new meter. In addition to MCWD permit inspections, the Town of Mammoth Lakes is responsible for enforcing the provisions of the CPC through their building permit process.

MCWD staff worked with the Town of Mammoth to develop their Water Efficient Landscape Ordinance (WELO) and continues to collaborate on landscape related issues. The Town of Mammoth Lakes' building codes and WELO can be accessed at

https://library.municode.com/ca/mammoth_lakes_/codes/code_of_ordinances?nodeId=TIT17ZO_ARTIII_S1PLGEDEST_CH17.40WAEFLARE

- c) A description of any water agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.*

As stated above, MCWD worked with the Town of Mammoth Lakes' staff regarding implementation of water conservation measures to increase water efficiency. In addition, MCWD has sought clarification from the CA State Water Resources Control Board (SWRCB) on terminology and intent of specific requirements implemented in response to the Governor's drought proclamations.

- d) A description of agency support positions with respect to adoption of legislation or regulations consistent with this BMP*

MCWD staff commented on the SWRCB's emergency water conservation requirements in December 2016. MCWD requested clear definitions of terminology used for standards in the Permanent

Prohibitions, i.e. measurable precipitation and public street medians. In addition, MCWD informed the SWRCB that summer precipitation in Mammoth Lakes is discrete in location, volume, and duration. Therefore, the prohibition against irrigating for 48 hours after a precipitation event is not enforceable. In addition, MCWD recommended irrigation restrictions be based on reference evapotranspiration needs rather than specified number of weekly irrigation days.

CUWCC Water Savings Assumptions

CUWCC does not require quantification of water savings.

3.3 Water Loss Control

The AWWA Water Loss software program was used in 2016, as required by CUWCC's BMP and the California Water Code, to track non-revenue water. In addition, staff began training sessions on using the Previously, MCWD used a simplified version of the AWWA Water Loss program that tracked non-revenue authorized uses, e.g. fire hydrant flushing, water-treatment process water, potable water leaving the treatment plants, and metered water delivered to customers. This monthly auditing system was appropriate for the size of the MCWD distribution system and has been an effective mechanism to quickly address high or unexpected water losses. MCWD's investments in infrastructure improvements have resulted in loss rates below CUWCC's 10 percent benchmark for non-revenue water.

CUWCC Implementation

Implementation shall consist of at least the following actions:

- 1) Standard Water Audit and Water Balance. All agencies shall quantify their current volume of apparent and real water loss. Agencies shall complete the standard water audit and balance using the AWWA Water Loss software to determine their current volume of apparent and real water loss and the cost impact of these losses on utility operations at no less than annual intervals.*
- 2) Validation. Agencies may use up to four years to develop a validated data set for all entries of their water audit and balance. Data validation shall follow the methods suggested by the AWWA Software to improve the accuracy of the quantities for real and apparent losses.*
- 3) Economic Values. For purposes of this BMP, the economic value of real loss recovery is based upon the agency's avoided cost of water as calculated by the Council's adopted Avoided Cost Model or other agency model consistent with the Council's Avoided Cost Model.*
- 4) Component Analysis. A component analysis is required at least once every four years and is defined as a means to analyze apparent and real losses and their causes by quantity and type. The goal is to identify volumes of water loss, the cause of the water loss and the value of the water loss for each component. The component analysis model then provides information needed to support the economic analysis and selection of intervention tools. An example is the Breaks and Background Estimates Model (BABE) which segregates leakage into three components: background losses, reported leaks and unreported leaks.*
- 5) Interventions. Agencies shall reduce real losses to the extent cost-effective. Agencies are encouraged to refer to the AWWA's 3rd Edition M36 Publication, Water Audits and Loss Control Programs (2009) for specific methods to reduce system losses.*
- 6) Customer Leaks. Agencies shall advise customers whenever it appears possible that leaks exist on the customer's side of the meter*

CUWCC Documentation Requirement:

- 1) Agency shall submit the completed AWWA Standard Water Audit and Water Balance worksheets in the BMP 1.2 report form for every reporting period.

The reporting worksheet from the AWWA Standard Water Audit and Water Balance worksheet is provided in Appendix 1 and the remaining audit worksheets are available upon request.

- 2) For each reporting period, agency shall keep and make available validation for any data reported.

Data and other information contained in requirements 2-5 are available upon request.

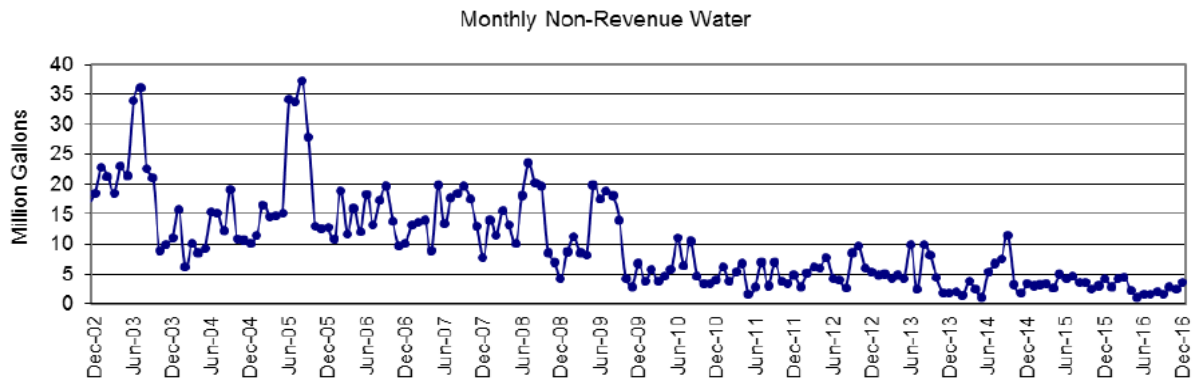
- 3) Agency shall maintain in-house records of audit results, methodologies, and worksheets for each completed audit period.
- 4) Agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances.
- 5) Agency, for the purpose of setting the Benchmark:
 - a) keeps records of intervention(s) performed, including standardized reports on leak repairs, the economic value assigned to apparent losses and to real losses, miles of system surveyed for leaks, pressure reduction undertaken for loss reduction, infrastructure rehabilitation and renewal, volumes of water saved, and costs of intervention(s); and
 - b) prepares a yearly summary of this information for submission

CUWCC Water Savings Assumptions

CUWCC does not have a water savings assumption for this BMP. However, since 2002, MCWD water losses have dropped from about 22 million gallons a month during the winter and 36 million gallons during the summer to remain under 5 million gallons annually. The figure below does not include water that is accounted for but does not generate revenue, e.g., fire hydrant and water line flushing and pipe breaks. The AWWA Water Loss Audit program includes all water entering the distribution system that does not generate revenue.

Some of the reduction of water loss may be attributed to improved accuracy of water meter readings as a result of the 2015 meter replacement project and the ongoing replacement of aging infrastructure. MCWD’s success in reducing non-revenue water is evident in the figure below.

Figure 1 Monthly Non-revenue Water 2003-2016



3.4 Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

CUWCC Implementation

For consistency with California Water Code (Section 525b), this BMP refers to potable water systems. A water meter is defined as a device that measures the actual volume of water delivered to an account in conformance with the guidelines of the American Water Works Association. Implementation shall consist of at least the following actions:

- 1. Require meters for all new service connections.*
- 2. Establish a program for retrofitting existing unmetered service connections.*
- 3. Read meters and bill customers by volume of use.*
 - a. Establish and maintain billing intervals that are no greater than bi-monthly (every two months) for all customers.*
 - b. For each metered connection, perform at least five actual meter readings (including remotely sensed) per twelve month period.*
- 4. Prepare a written plan, policy or program that includes:*
 - a. A census of all meters, by size, type, year installed, customer class served and manufacturer's warranty accuracy when new;*
 - b. A currently approved schedule of meter testing and repair, by size, type and customer class;*
 - c. A currently approved schedule of meter replacement, by size, type, and customer class; and*
- 5. Identifying intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters, and conducting a feasibility study(s) to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.*

CUWCC Documentation Requirement:

- 1. Confirmation that all new service connections are metered and are being billed by volume of use and provide:*
 - a. Number of metered accounts;*

There are approximately 3,515-metered accounts. Accounts may have multiple meters associated with the account.

- b. Number of metered accounts read;*

Since March 2015, meter reads occur hourly and the data is transmitted to MCWD every 24 hours.

- c. Number of metered accounts billed by volume of use;*

All accounts are billed by volume of use.

- d. Frequency of billing (i.e. six or twelve times per year) by type of metered customer (e.g. single-family residential, multiple-family residential, commercial, industrial, and landscape irrigation); and*

All metered accounts are billed monthly except for 14 seasonal cabins that are billed once a year.

- e. *Number of estimated bills per year by type of metered customer (e.g. single-family residential, multiple-family residential, commercial, industrial, and landscape irrigation) vs. actual meter readings.*

Monthly estimated reads in fiscal years shown below are not separated into customer classes.

# estimated reads	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
2014 – 2015	810	26	28	54	96	591	430	328	52	3	5	5
2015 – 2016	9	24	6	3	4	5	2	6	5	3	4	14
2016 – 2017	21	16	16	20	29	27	25	27	24	236	60	60

The meter replacement was completed in spring of 2015. Initially the new meter system reduced the number of estimated reads, but in early 2017, problems with the data collectors occurred and reads were estimated until the hardware issues were resolved.

- 2. *Number of unmetered accounts in the service area. For the purposes of evaluation, this shall be defined as the baseline meter retrofit target, and shall be used to calculate the agency’s minimum annual retrofit requirement.*

All accounts are metered for usage.

- 3. *Number of unmetered service connections retrofitted during the reporting period.*

All accounts are metered for usage.

- 4. *Estimated number of CII (commercial/industrial/institutional) accounts with mixed-use meters.*

The MCWD has 143 Commercial, 29 Institutional, and 1 Industrial accounts.

- 5. *Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period*

None.

CUWCC Water Savings Assumptions

Assume meter retrofits and volumetric rates combined will result in a 20% reduction in demand for retrofitted accounts

No new retrofits occurred during the reporting period.

3.5 Retail Conservation Pricing

CUWCC Implementation and Coverage

The intention of this CUWCC BMP is to promote conservation through increasing volumetric water rate structures. The CUWCC’s goal for water agencies is to maximize the volumetric water sales percentage of revenue to encourage conservation. The BMP calculation used to determine adequacy of the rate

structure aims for a result of greater than or equal to 70 percent of water sale revenue from volumetric sales.

MCWD’s percentage of volumetric revenue is 46 percent, based on CUWCC’s calculations. MCWD believes the CUWCC’s standard of 70 percent or greater results in an unsustainable revenue stream that cannot support the delivery of water because operations are largely based on fixed costs. A rate structure meeting CUWCC’s standard would result in significant financial instability during periods of high water conservation.

Water agencies in California suffered financial shortfalls resulting from State mandated conservation in 2015 because sales revenue generated by volumetric sales were sharply reduced. The significant revenue loss resulted in easing conservation standards in 2016. The State Water Resources Control Board estimated water sale revenue losses at \$673 million if mandatory conservation were in effect in 2016.

MCWD depends on customer awareness, water conservation regulations, incentive and education programs and enforcement of conservation regulations to achieve conservation goals.

CUWCC Documentation Requirement:

1. Report the rate structure in effect for each customer class for the reporting period.

Rates for FY 2017 are provided below.

Base rates depend on the size of the meter serving the account.

Meter size, in inches	Monthly charge
5/8 and 3/4	\$13.89
1	\$21.04
1 1/2	\$38.93
2	\$60.39
3	\$128.35
4	\$228.52
6	\$503.96
8	\$861.68

Consumption charges, FY 2017

Customer class	Monthly charge per 1,000 gallons
Single family residential, tiered pricing	
0 – 4,000 gallons	\$0.91
4,001 – 8,000 gallons	\$2.12
Over 8,000 gallons	\$4.66
Multi-family residential, not tiered pricing	\$2.16
Commercial, not tiered pricing	\$2.88
Irrigation, tiered pricing	
Up to 100% of Maximum Applied Water Allowance	\$2.53
Over 100% of MAWA to 200% of MAWA	\$5.70
Over 200% of MAWA	\$8.44

The table above includes the District's tiered pricing for irrigation accounts that is based on monthly Maximum Applied Water Allowances (MAWA) for each account. MAWA is based on estimates of local monthly evapotranspiration and measured landscape area, and is unique to each irrigation account. Implementation of irrigation tiered pricing has been an effective tool to reduce excessive irrigation practices. The District is evaluating whether monthly water demand from mixed-use meter accounts can be parsed into domestic and irrigation usage and billed accordingly. The ability to separate domestic and irrigation use would incentivize mixed-use meter customers to reduce irrigation demand to meet MAWA. Significant financial barriers exist to retrofit separate irrigation meters for existing accounts.

A complete description of MCWD rates for all customer classes is available in MCWD's Code Book, Chapter 12, section 6.12. A link to Chapter 12 is http://www.mcwd.dst.ca.us/assets/code_ch12.pdf.

2. Report the annual revenue derived from volume charges for each retail customer class.

The total revenue from volume sales for fiscal year 2017 was \$1,452,558. The data is not separated by customer class.

3. Report the annual revenue derived from monthly meter/service charges for each retail customer class.

The total base meter service charge revenue for fiscal year 2017 was \$1,694,113. The data is not separated by customer class.

CUWCC Water Savings Assumptions

CUWCC does not have a quantified water savings assumption.

3.6 Retail Wastewater Rates

This BMP is designed to create incentives to reduce sewer flows through a conservation pricing structure based on metered water use. MCWD has not implemented a volume based wastewater charge and does not have the infrastructure necessary to measure effluent flows. Wastewater rates are based on customer classes. Commercial account charges are based on estimates of wastewater contributions or the type of wastewater produced. No water saving assumptions are provided by CUWCC for this BMP.

4.0 EDUCATION PROGRAMS

4.1 Public Information Programs

CUWCC Implementation

Implement a public information program to promote water conservation and water conservation-related benefits. Implementation shall consist of at least the following actions:

1. The program should include, when possible, but is not limited to, providing speakers to employees, community groups and the media; using paid and public service advertising; using bill inserts;

providing information on customers' bills showing use for the last billing period compared to the same period the year before; providing public information to promote water conservation measures; and coordinating with other government agencies, industry groups, public interest groups, and the media.

- 2. The program should include, when possible, social marketing elements which are designed to change attitudes to influence behavior. This includes seeking input from the public to shape the water conservation message; training stakeholders outside the utility staff in water conservation priorities and techniques; and developing partnerships with stakeholders who carry the conservation message to their target markets.*
- 3. When mutually agreeable and beneficial, the wholesale agency or another lead regional agency may operate all or part of the public information program. If the wholesale agency operates the entire program, then it may, by mutual consent with the retail agency, assume responsibility for CUWCC reporting for this BMP. Under this arrangement, a wholesale agency may aggregate all or portions of the reporting and coverage requirements of the retail agencies joining into the mutual consent.*

CUWCC Documentation Requirement:

Report on minimum requirements below and other activities contained in CUWCC Program List.

- 1. Contacts with the public (minimum = 4 times per year, i.e., at least quarterly).*

MCWD provides public speakers when requested and meets the four times a year requirement for this BMP. Presentations are regularly provided to local service organizations, students, contractors, and government agencies. In addition to presentations at local organizations, MCWD participated in an annual Mammoth Middle School sixth-grade tour of MCWD water facilities in the Lakes Basin and wastewater treatment plant, a special presentation was given to the sixth-grade class on water conservation and MCWD operations, and a water-efficiency landscape class focused on soil amendments, fertilizing, and pruning was hosted by MCWD.

- 2. Water supplier contacts with media (minimum = 4 times per year, i.e., at least quarterly).*

MCWD has an ongoing program for news releases and weekly advertisements regarding the irrigation schedule and current conservation regulations during the summer months when water demand is highest and conservation regulations are closely monitored. The frequency of news releases meets the four times a year requirement. During the non-irrigation season, news releases focus on MCWD's fats, oil and grease program and the water efficient fixture replacement rebate program. Advertisements and news releases are published in the Mammoth Lakes and Bishop newspapers and radio stations.

- 3. An actively maintained website that is updated regularly (minimum = 4 times per year, i.e., at least quarterly).*

MCWD's website is updated regularly. Conservation regulations are noticed on the front page and kept current. All news releases are posted and front page information is changed regularly to keep current with the most relevant topics for MCWD's customers.

- 4. Description of materials used to meet minimum requirement.*

To reach the public with water conservation messages, the MCWD staff provides public presentations; publishes paid advertising in the local media; send out news releases on all MCWD related issues; posts on social media; provides free water-efficiency items for customers; runs a water-efficiency rebate

program; hosts classes on water efficiency topics; and provides landscape water reports to property managers and homeowner associations.

5. *Annual budget for public outreach program.*

The budget for fiscal year 2016 was \$130,600, excluding staff time. This total includes a mid-year increase to the rebate program budget to accommodate higher than normal requests from commercial properties.

6. *Description of all other outreach programs (Program List contained in CUWCC Exhibit 1, 2.1.,D.).*

Other outreach programs, not included in #4 above, are:

- Increased enforcement of water conservation regulations;
- Implemented a leak detection program utilizing hourly read data from new meter reading equipment;
- Reviewed and commented on Town zoning and development projects that potentially affect water supply;
- Included customer conservation messages on monthly water bills;
- Printed and distributed magnets with irrigation schedules and general conservation messages;
- Worked one-on-one with irrigation customers with high consumption; and
- Continued to provide landscape maintenance on low-water use demonstration garden at entrance to Mammoth Lakes.

CUWCC Water Savings Assumptions

CUWCC does not have a quantified water savings assumption.

4.2 School Education Programs

MCWD supports and participates in a classroom education program to reach our local youth. This program engages students by teaching them the importance of water and energy conservation and provides tools to achieve results through provision of an energy and water conservation resource kit. This early introduction to conservation should result in life-long lifestyle changes.

CUWCC Implementation

Implementation shall consist of at least the following actions:

1. *Implement a school education program to promote water conservation and water conservation-related benefits.*
2. *Programs shall include working with school districts and private schools in the water suppliers' service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Educational materials shall meet the state education framework requirements and grade-appropriate materials shall be distributed.*
3. *When mutually agreeable and beneficial, the wholesale agency or another lead regional agency will operate all or part of the education program; if the wholesale agency operates all or part of the retail agency's school education program, then it may, by mutual consent with the retail agency,*

assume responsibility for CUWCC reporting of this BMP; under this arrangement, a wholesale agency may aggregate all or portions of the reporting and coverage requirements of the retail agencies joining into the mutual consent.

CUWCC Documentation Requirement:

1. *Curriculum materials developed and/or provided by agency (including confirmation that materials meet state education framework requirements and are grade-level appropriate).*

The MCWD helps sponsor and participates in providing the LivingWise program to the sixth grade class at Mammoth Middle School. The program is a grade appropriate water and energy conservation curriculum that meets state learning standards. Information on the LivingWise program can be found at <http://www.resourceaction.com/programs/k-12-education/livingwise/>.

2. *Materials distributed to K-6 students. When possible, school education programs will reach grades 7-12 as well*

The MCWD does not provide education programs to grade levels other than the sixth grade. Mammoth Lakes is a relatively small community and the increased need for staff time and cost of expanding the school education program has not been deemed necessary.

3. *Description of materials used to meet minimum requirement.*

Students in the LivingWise Program conduct home water and energy audits before and after installing water and energy efficiency items. This process helps the students realize that they can affect the local, regional, and global demand for water and energy. Each student received a high efficiency showerhead, a bag to test flow rates, toilet leak tablets, a compact florescent lamp, digital thermometer, FilterTone alarm, LimeLite night lite, and a tape measure. The class also develops a unique program each year to apply their new knowledge. Last year the students created animated videos on water conservation that were posted to YouTube. Each year, MCWD staff takes the students on a tour of MCWD's water facilities in the Lakes Basin, wastewater treatment plant and solar array.

4. *Annual budget for school education program.*

The MCWD provides a partial sponsorship of \$4,000 for the program and provides staff time for classroom talks and to tour MCWD facilities over two days.

5. *Description of all other water supplier education programs*

MCWD staff gave a presentation about water conservation and MCWD operations and led tours for the 6th grade students at the Mammoth Middle School and to a 6th through 8th grade group from the Lee Vining public school.

CUWCC Water Savings Assumptions

CUWCC does not have a quantified water savings assumption.

5.0 RESIDENTIAL

5.1 Residential Assistance Program

Retail water agencies shall implement a water use efficiency program that consists of either the coverage goals listed below or achieving the water savings goals by implementing measures on the Flex Track Menu in Section F below.

1. *Residential assistance program (formerly BMPs 1 & 2)*

Provide site-specific leak detection assistance that may include, but is not limited to, the following: a water conservation survey, water efficiency suggestions, and/or inspection. Provide showerheads and faucet-aerators that meet the current water efficiency standard as stipulated in the WaterSense Specifications (WSS) as needed.

2. *Landscape water survey (formerly BMP 1)*

Perform site-specific landscape water surveys that shall include, but are not limited to, the following: check irrigation system and timers for maintenance and repairs needed; estimate or measure landscaped area; develop customer irrigation schedule based on precipitation rate, local climate, irrigation system performance, and landscape conditions; review the scheduling with customer; provide information packet to customer; and provide customer with evaluation results and water savings recommendations.

3. *High-efficiency clothes washers (HECWs) (formerly BMP 6)*

Provide incentives or institute ordinances requiring the purchase of high-efficiency clothes washing machines (HECWs) that meet an average water factor value of 5.0. If the WaterSense specification is less than 5.0, then the average water factor value will decrease to that amount.

4. *WaterSense Specification (WSS) toilets (formerly BMP 14)*

Provide incentives or ordinances requiring the replacement of existing toilets using 3.5 or more gpf (gallons per flush) with a toilet meeting WSS.

5. *WaterSense Specifications for residential development*

Provide incentives such as, but not limited to, rebates, recognition programs, or reduced connection fees, or ordinances requiring residential construction meeting WSS for single-family and multi-family housing until a local, state or federal regulation is passed requiring water efficient fixtures.

CUWCC Documentation Requirement:

1. *Residential assistance*

Provide reports, disaggregated by single-family and multi-family units, identifying: the number of residential assistance/leak detection survey visits completed; number of WSS showerheads distributed; and number of WSS faucet aerators distributed during the reporting period.

MCWD has a customer portal program, WaterSmart, to assist customers and conservation staff in detecting potential leaks. Customers with WaterSmart accounts can receive alerts for unusually high usage or suspected leaks. MCWD staff receive daily leak reports that are used to contact customers and ensure leaks are repaired. This leak detection program started in January 2015. For fiscal year 2017, 142 customers were notified by WaterSmart, MCWD or both, regarding leaks on their property. MCWD does not disaggregate types of dwelling units in the leak detection program.

In FY 2017, MCWD provided a variety of water efficiency products for no cost. Customers picked up 210 free water-efficient showerheads, 50 faucet aerators, 25 shut-off hose nozzles, 135 shower timers, and magnets with the irrigation schedule. MCWD also provides free dye tablets for customers and property managers to detect leaking toilets. Over 50 dye tablets were handed out to customers and property managers last year.

Landscape Water Surveys

Provide the number of single-family account landscape water surveys completed during the reporting period.

MCWD does not normally provide landscape water surveys for single-family homes. However, staff will help customers develop a water budget if requested. MCWD staff recommends customers work with a specialist for technical assistance regarding irrigation and plant selection. Water consumption at the single-family homes in calendar year 2016 is 28% less compared to 2013 or 48 million gallons less (147 acre-feet). The unit count for this customer class has risen by 22 units since 2013. Irrigation season use dropped by 18% between 2013 and 2016. It is assumed reduced irrigation consumption is primarily responsible for the seasonal decrease in use because usage triples during the irrigation season.

2. High efficiency clothes washers

The number of installations credited to the agency's replacement program for HECWs with an average water-factor value of 5.0. If the WaterSense Specification is less than 5.0, then the water factor value will decrease to that amount.

The MCWD indoor rebate program requires clothes washers have a water factor of 4.5 or lower to be eligible for a rebate. This water factor is below the current WaterSense Standard of 5.0. In fiscal year 2016, 42 washers were installed through this program. The clothes washer rebate is \$300 for a personal machine or \$400 for a common area machine.

3. WaterSense Specification (WSS) toilets

A description of the program along with the number of WSS toilet installations credited to the agency's replacement program disaggregated by single-family or multi-family units.

The MCWD indoor rebate program only provides rebates for replacement toilets using 1.28 gpf or less, the same as the WSS. In fiscal year 2016, 331 toilets were installed through this program. This number includes single-family homes, multi-family buildings and commercial establishments. Toilet rebates are \$200 for the first two toilets in a dwelling and \$100 for each additional toilet being replaced. New toilets installed in new construction projects, including newly constructed bathrooms from remodeling, are not eligible for a rebate.

4. WSS for new residential development

Provide a copy of the new development ordinance currently adopted by the reporting unit or provide the following incentive program details: number of new single-family and multi-family units built in service area during the reporting period; description of incentives offered; list of incentive amounts; number of WSS fixtures installed; and number of participating single-family home and multi-family units.

The California Green Building Code addresses the elements of this measure. The Green Building Code requires new developments install water efficient fixtures that meet WSS. MCWD allows project applicants to reduce fixture counts by changing all building fixtures to WSS because the Green Building Code does not require remodel projects to meet water conservation standards. Reducing fixture counts

can allow a project to retain their current meter instead of upgrading to a larger meter at a significant cost to the customer. MCWD does not have Town building data, i.e. number of new dwelling units, requested by this measure.

CUWCC Water Savings Assumptions

Water savings assumptions will be based on the type and number of actions implemented.

MCWD does not have the ability to separate water savings achieved from landscape irrigation programs, enforcement of water conservation regulations, the leak program and other MCWD conservation programs. However, the indoor rebate program is estimated to save about 2.3 million gallons annually. MCWD water saving estimates decrease savings if older toilets remain in the unit. The school water and energy program, LivingWise, reported a residential water savings of 368,526 gallons through the installation of water efficiency aerators and showerheads.

6.0 COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL (CII)

CUWCC Implementation

Implement measures to achieve the water savings goal for CII accounts of 10% of the baseline water use over a 10-year period. Baseline water use is defined as the water consumed by CII accounts in the agency's service area in 2008. Credit for prior activities, as reported through the BMP database, will be given for up to 50% of the goal; in this case, coverage will consist of reducing annual water use by CII accounts by an amount equal to the adjusted percentage goal within 10 years. Implementation shall consist of item 1) or 2) or both in order to reach the agency's water savings goals.

CUWCC Documentation Requirement:

MCWD has evaluated the most likely areas in our customer base to reduce inefficient water usage. Since 2012, MCWD has focused staff time on inefficient irrigation usage. Any Commercial, Institutional and Industrial customer with an irrigation meter has been required to reduce irrigation usage to a set allowance based on landscape size. In addition, CII customers take advantage of the water conservation rebates and receive calls if leaks are suspected on their property. The CII customer category consists of a large mix of business types, residential, and institutional/public customers. As a result, there is no single water conservation measure that specifically targets CII customers. MCWD will be reviewing this class for potential targeted programs to reduce demand.

CUWCC Water Savings Assumptions

This BMP is not currently implemented by the MCWD.

7.0 LANDSCAPE

CUWCC Implementation

Agencies shall provide non-residential customers with support and incentives to improve their landscape water use efficiency. Credit for prior activities, as reported through the BMP database, will be given for

documented water savings achieved through 2008. This support shall include, but not be limited to, the following:

1. *Accounts with Dedicated Irrigation Meters*

- a. *Identify accounts with dedicated irrigation meters and assign ETo-based water use budgets equal to no more than an average of 70% of ETo (reference evapotranspiration) of annual average local ETo per square foot of landscape area in accordance with the schedule below.*

Recreational areas (portions of parks, playgrounds, sports fields, golf courses, or school yards in public and private projects where turf provides a playing surface or serves other high-use recreational purposes) and areas permanently and solely dedicated to edible plants, such as orchards and vegetable gardens, may require water in addition to the water use budget. (These areas will be referred to as “recreational” below.) The water agency must provide a statement designating those portions of the landscape to be used for such purposes and specifying any additional water needed above the water use budget, which may not exceed 100% of ETo on an annual basis. If the California Model Water Efficient Landscape Ordinance is revised to reduce the water allowance, this BMP will be revised automatically to reflect that change.

- b. *Provide notices each billing cycle to accounts with water use budgets showing the relationship between the budget and actual consumption.*
- c. *Offer site-specific technical assistance to reduce water use to those accounts that are 20% over budget in accordance with the schedule given in Section B; agencies may choose not to notify customers whose use is less than their water use budget.*

2. *Commercial/Industrial/Institutional (CII) Accounts without Meters or with Mixed-Use Meters*

- a. *Develop and implement a strategy targeting and marketing large landscape water use surveys to commercial/industrial/institutional (CII) accounts with mixed-use meters.*
- b. *In un-metered service areas, actively market landscape surveys to existing accounts with large landscapes, or accounts with landscapes which have been determined by the purveyor not to be water efficient.*

3. *Offer financial incentives to support 1) and 2) above.*

CUWCC Documentation Requirement:

1. *Dedicated Landscape Irrigation Accounts*

- a. *Number of dedicated irrigation meter accounts.*

MCWD has 78 irrigation accounts. This count includes irrigation meters accounts for recreation facilities, but does not include the two golf courses that receive raw and recycled water.

- b. *Number of dedicated irrigation meter accounts with water budgets.*

All irrigation accounts identified above have water budgets.

- c. *Aggregate water use for dedicated non-recreational landscape accounts with budgets.*

Irrigation accounts that are not used for recreation consumed 48.7 million gallons in 2016. For comparison, in 2014 these accounts used 258 million gallons. Account data for 2013 is not presented for comparison because of data losses during a financial platform transition.

d. Aggregate acreage assigned water budgets and average ET for dedicated non-recreational landscape accounts with budgets.

There are 91.4 acres in the MCWD service area that have irrigation budgets (MAWAs) and are not recreational landscapes. Irrigation consumption in 2016 compared to 100% of MCWD developed MAWA budgets are presented here. The 48.7 million gallons of non-recreation irrigation in 2016 was 60% of 100% of MAWA (81 million gallons). In 2016, Level 3 Water Shortage Restrictions were still in effect. The restrictions required irrigation accounts to reduce consumption by 20% or they would be subject to violation notices and penalties.

The request for documenting average ET is not clear. MCWD does not have a local weather station collecting ET data. The closest station, in Bishop, has significantly different temperatures and does not meet DWR standards.

e. Number of Accounts 20% over-budget.

Nine accounts water were 20% over their MAWA budget in 2016.

f. Number of accounts 20% over-budget offered technical assistance.

All accounts that were 20% over their MAWA budget were contacted. Conservation staff provides assistance as necessary but over-irrigation is typically a result of poorly managed landscapes. Since 2012, MCWD Conservation staff has spent numerous hours with property managers to help increase irrigation effectiveness and reduce usage. Staff provides monthly updates to irrigation account holders to inform them of current irrigation regulations and to provide the previous month's usage if they are higher than the current irrigation regulations allow. Staff will provide assistance to reduce the amount of applied water stay within current irrigation requirements. Staff has also brought irrigation specialist to demonstrate water-efficient irrigation fixtures and conducted field demonstrations to install the fixtures in an actual irrigation system. Conservation staff have concluded, violation notices and enforcement procedures are the most effective means to achieve compliance with water conservation regulations.

g. Number of accounts 20% over-budget accepting technical assistance

Staff did not record the number of accounts that requested assistance. Several customers opened accounts with our customer portal, WaterSmart, and signed up for high usage and leak alerts. In addition, property managers are more frequently working closely with MCWD to better manage irrigation usage on a weekly or monthly basis.

h. Aggregate acreage of recreational areas assigned water budgets and average ET for dedicated recreational landscape accounts with budgets.

The total gallons of MAWA for recreational use is 21,219,825 gallons (65 acre-feet). Total usage in 2016 was 10,926,095 gallons. The 18-hole Sierra Star and the 9-hole Snowcreek golf courses only utilize recycled water when it is available and raw water when necessary.

2. CII Accounts without Meters or with Mixed-Use Meters

a. Number of mixed use and un-metered accounts.

MCWD does not have any unmetered accounts. There are 141 Commercial, 28 Institutional, and 1 Industrial mixed-use accounts.

b. Number, type, and dollar value of incentives, rebates, and no- or low-interest loans offered to, and received by, customers.

This response addresses incentives for landscape irrigation and CII accounts. MCWD offers rebates for landscape efficiency projects. To receive a landscape rebate, MCWD requires the customer provide a site layout with the changes to be implemented. During the rehabilitation process, MCWD is kept up to date on whether the project is proceeding as described. Following project completion, rebates are not paid until water savings are demonstrated the following year. These requirements appear to be a disincentive for irrigation rebates. However, these requirements were developed by MCWD after working with several projects that were not implemented as presented to MCWD or did not result in meaningful demand reductions or a combination of both.

Five CII customers received rebates from MCWD. One large rebate involved the replacement of 19 commercial clothes washers for a laundromat.

c. Number of surveys offered.

MCWD does not have a specific CII survey program. The focus for conservation efforts is based on top users. If a CII customer is a top user and the use is deemed excessive, MCWD will contact the customer to understand why the usage is high and recommend methods to reduce demand.

d. Number of surveys accepted.

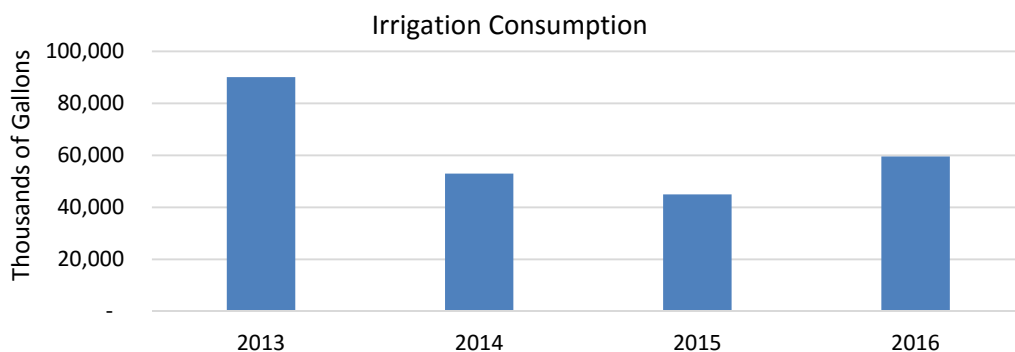
See response above.

e. Estimated annual water savings by customers receiving surveys and implementing recommendations.

MCWD did not conduct surveys.

CUWCC Water Savings Assumptions

Assume landscape BMP will result in a 15%-20% reduction in demand for landscape irrigation by affected accounts, as defined in Section C: Coverage Requirements



Water consumption for irrigation only accounts, as shown in the graph above, does not include golf course irrigation because the two golf courses only use untreated raw or recycled water. Consumption has decreased significantly since 2013. The number of irrigation accounts increased in 2014 when a few mixed-use meters were corrected to be irrigation only meters. These meters serve large landscape condominium projects. In 2015, another large irrigation account, the elementary school, was added. Usage increase in 2016 because customers perceived the drought as over even though MCWD maintained Level 3 Water Shortage Restrictions to provide the groundwater aquifer more time to recover.

8.0 RECOMMENDATIONS FOR FY 2018

MCWD conservation staff has been satisfied with the results from the last five years of focused attention on irrigation accounts, the leak detection program, and the customer portal and analytics available through the WaterSmart platform. Staff has learned the success of these programs depends on follow-up and perseverance as property managers change and new leaks develop. The main emphasis in FY 2018 will be the continuation of the programs currently in place. As time allow, staff will review the CII customer class and multifamily customer classes to assess the potential to standardize water use and/or implement conservation measures focused on those categories. The State will likely require the implementation of new conservation measures to be implemented in the coming year that will use indoor and landscape irrigation standards for setting water efficiency goals that must be met by the supplier. It is anticipated the new standards will involve a significant amount of staff time to prepare data necessary to implement the new requirements.

The MCWD conservation staff will continue to work with DWR to facilitate construction of a California Irrigation Management System (CIMIS) weather station to record daily, local evapotranspiration (ET) values. Once the station is transmitting daily ET data, the data will be used to adjust MAWA for weather extremes and provide data to irrigation controllers designed to collect local ET data. The MCWD has been working with landowners to site a station in Mammoth Lakes but has not been successful. The Department of Water Resources is contacting local landowners to discuss placing a CIMIS station on their property.

APPENDIX 1

**AWWA Water Audit Software:
Reporting Worksheet**

Water Audit Report for: Mammoth Lakes (2610001)
Reporting Year: 2016 1/2016 - 12/2016

All volumes to be entered as: ACRE-FEET PER YEAR

WATER SUPPLIED						Master Meter and Supply Error Adjustments	
						Pcnt:	Value:
Volume from own sources:	7	1,744.007	acre-ft/yr	3	-		
Water imported:	n/a		acre-ft/yr		0.174		
Water exported:	n/a		acre-ft/yr				
WATER SUPPLIED:		1,744.181	acre-ft/yr				

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION							
Billed metered:	9	1,643.672	acre-ft/yr				
Billed unmetered:	n/a	0.000	acre-ft/yr				
Unbilled metered:	n/a	0.000	acre-ft/yr				
Unbilled unmetered:		21.802	acre-ft/yr				
				Pcnt:	Value:		
				1.25%			24061

Default option selected for Unbilled unmetered - a grading of 5 is applied but not displayed

AUTHORIZED CONSUMPTION: 1,665.474 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption): 78.707 acre-ft/yr

Apparent Losses							
Unauthorized consumption:		4.360	acre-ft/yr				
				Pcnt:	Value:		
				0.25%			

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	8	16.603	acre-ft/yr	1.00%			
Systematic data handling errors:	6	1.644	acre-ft/yr			1.644	

Apparent Losses: 22.607 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **56.099** acre-ft/yr

WATER LOSSES: **78.707** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **100.509** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains: 10 66.0 miles
 Number of active AND inactive service connections: 7 3,746
 Service connection density: 57 conn./mile main
 Are customer meters typically located at the curbstops or property line?
 Yes

Average length of customer service line:
Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 7 110.0 psi

COST DATA

Total annual cost of operating water system: 10 \$3,949,762 \$/Year
 Customer retail unit cost (applied to Apparent Losses): 9 \$2.36 \$/1000 gallons (US)
 Variable production cost (applied to Real Losses): 7 \$155.36 \$/acre-ft

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 76 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

- 1: Volume from own sources
- 2: Unauthorized consumption
- 3: Variable production cost (applied to Real Losses)