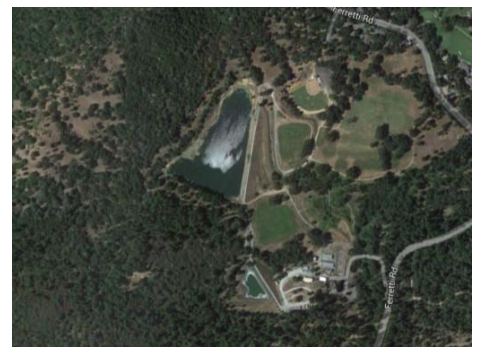


# GROVELAND COMMUNITY SERVICES DISTRICT



## 2020 URBAN WATER MANAGEMENT PLAN

November 2021

Prepared by:



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## ABBREVIATIONS

AF	Acre-Feet
AWS	Alternative Water Supply
ACS	American Community Survey
AB	Assembly Bill
AMR	Automatic Metering Reading
BMP	Best Management Practice
CIMIS	California Irrigation Management Information System
CASGEM	California Statewide Groundwater Elevation Monitoring
CWC	California Water Code
Census	United States Census Bureau
CDP	Census Designated Place
DMM	Demand Management Measure
DOF	Department of Finance
DWR	Department of Water Resources
DDW	Division of Drinking Water
DRA	Drought Risk Assessment
ERP	Emergency Response Plan
EDU	Equivalent Dwelling Unit
ET <sub>o</sub>	Evapotranspiration
GAL	Gallons
GPCD	Gallons per Capita Day
GPM	Gallons per Minute
GIS	Geographical Information System
GCSD	Groveland Community Services District
CCF	Hundred Cubic Feet
in	Inch
ITP	Independent Technical Panel
kWh	Kilowatt-Hour
kWh/MG	Kilowatt-Hours per Million Gallons

LT	Long Term
MHI	Median Household Income
MG	Million Gallons
MGD	Million Gallons per Day
MG/L	Milligrams per Liter
MF	Microfiltration
ml/l-hr	Milliliter per Liter Hour
MID	Modesto Irrigation District
MFR	Multi-Family Residential
MWC	Mutual Water Company
PML	Pine Mountain Lake
PMLA	Pine Mountain Lake Association
PWS	Public Water System
PRV	Pressure Reducing Valve
SFPUC	San Francisco Public Utilities Commission
SB	Senate Bill
SFR	Single Family Residential
SWRCB	State Water Resources Control Board
SWTR	Surface Water Treatment Rule
TS-IRWMP	Tuolumne-Stanislaus Integrated Regional Water Management Plan
TID	Turlock Irrigation District
USDA	United States Department of Agriculture
UWMP	Urban Water Management Plan
UWMPA	Urban Water Management Plan Act
WSCP	Water Shortage Contingency Plan
WWTP	Wastewater Treatment Plant
WRCC	Western Regional Climate Center

## LAY DESCRIPTION

The Groveland Community Services District (GCSD) has prepared this 2020 Urban Water Management Plan (UWMP) as required by the California Department of Water Resources (DWR) for all urban water suppliers that provide water for municipal purposes to more than 3,000 customers within the State of California. This 2020 UWMP follows the State’s requirements as defined in the California Water Code (CWC) and in the Urban Water Management Guidebook 2020 (DWR, 2021). The GCSD’s 2020 UWMP was adopted by the Board of Directors on \_\_\_\_\_, 2021, and submitted to DWR within 30 days after adoption. The 2020 UWMP is summarized in the flowing sections in a lay description, or executive summary, which provides the key components of each chapter of the UWMP. Table LD-1 provides a summary of each chapter within the GCSD’s UWMP.

<b>Table LD-1 Overview of the 2020 UWMP</b>	
<b>Chapter</b>	<b>Information Within Chapter</b>
Chapter 1 – Introduction and Overview	<ul style="list-style-type: none"> <li>• General legal requirements for the 2020 UWMP.</li> <li>• Plan organization.</li> </ul>
Chapter 2 – Plan Preparation	<ul style="list-style-type: none"> <li>• Plan preparation.</li> <li>• Coordination and outreach.</li> </ul>
Chapter 3 – System Description	<ul style="list-style-type: none"> <li>• Description of the GCSD's service area and water system.</li> <li>• Climate and hydrologic characteristics.</li> <li>• Current and projected population. Socioeconomics, and demographics.</li> </ul>
Chapter 4 – Water Use Characterization	<ul style="list-style-type: none"> <li>• Description of the GCSD's water use.</li> <li>• Current and projected water use and demand.</li> <li>• System water losses.</li> <li>• Climate change impacts on water use.</li> </ul>
Chapter 5 – SB X7-7 Baselines, Targets, and 2020 Compliance	<ul style="list-style-type: none"> <li>• Baseline daily gross per capita water use.</li> <li>• 2020 target compliance.</li> </ul>
Chapter 6 – Water Supply Characterization	<ul style="list-style-type: none"> <li>• Description of the GCSD's water supplies, including groundwater, surface water, recycled water, and wastewater.</li> <li>• Expected future water projects.</li> <li>• Current and projected water supplies.</li> <li>• Climate change and regulatory condition impacts to supplies.</li> </ul>
Chapter 7 – Water Service Reliability and Drought Risk Assessment	<ul style="list-style-type: none"> <li>• Description of constraints on the GCSD's surface water supply. Projections for water supplies and demands under normal, single dry year, and five-consecutive dry years conditions.</li> <li>• Regional supply reliability.</li> <li>• Climate change impacts on supply reliability.</li> </ul>
Chapter 8 – Water Shortage Contingency Plan	<ul style="list-style-type: none"> <li>• Annual Water Supply and Demand Assessment procedures.</li> <li>• Description of the GCSD’s water shortage levels and actions.</li> <li>• Compliance and enforcement for water shortage actions.</li> <li>• Catastrophic and seismic risk assessment for the GCSD’s water system.</li> <li>• Overview of communication protocols.</li> </ul>

<b>Table LD-1 Overview of the 2020 UWMP</b>	
<b>Chapter</b>	<b>Information Within Chapter</b>
Chapter 9 – Demand Management Measures	<ul style="list-style-type: none"> <li>• Description of the GCSD’s Demand Measurement Measures implemented over the past five years.</li> <li>• Current and future Demand Measurement Measures.</li> </ul>
Chapter 10 – Plan Adoption, Submittal, and Implementation	<ul style="list-style-type: none"> <li>• Procedures followed for 2020 UWMP noticing and adoption process.</li> <li>• Plan and amendment submittal process.</li> </ul>

The GCSD’s 2020 UWMP reports on a calendar year basis, with 2020 spanning from January 1, 2020, through December 31, 2020. UWMP regulations require the GCSD to report actual supply and demand for 2020 in addition projected supply and demand in five-year increments through 2045. Projecting supply and demand through 2045 allows the GCSD to assess the reliability and potential shortages that may come from population growth, climate change, and projected regional supply changes.

## **CHAPTER 1 – INTRODUCTION AND OVERVIEW**

Water planning is an essential function of water suppliers and is critical as California continues to deal with ongoing drought conditions and expected long-term climate changes. Prior to the adoption of the Urban Water Management Planning Act (UWMPA) in 1983, there were no specific requirements for water agencies to conduct long-term resource planning. The UWMPA provided the foundation for the development of the UWMP, which provides the framework for long-term water planning. Additionally, the UWMP informs the public about water agencies long-term resource planning efforts that will ensure adequate water supplies for existing and future demands. This 2020 UWMP documents the availability of an appropriate level of reliability of water service sufficient to meet the needs of the GCSD during normal, single dry and multiple dry years. A long-term reliable supply of water is essential to protect the productivity of the GCSD and California’s business and economic climate.

This 2020 UWMP is intended to serve as a general, flexible, and open-ended document that can be periodically updated to reflect changes in regional water supply trends and water use efficiency policies. This UWMP, along with other GCSD planning documents, will be used by GCSD staff to guide water use and management efforts through the year 2025, when the UWMP is required to be updated.

## **CHAPTER 2 – PLAN PREPARATION**

The GCSD has prepared this 2020 UWMP in accordance with the UWMPA, sections 10610 through 10656 of the CWC. This UWMP summarizes the GCSD’s projected retail water demands and characterizes the source water available to meet those demands for the years of 2025 through 2045. This UWMP also describes the reliability of the GCSD’s water supplies and discusses the GCSD’s water shortage contingency plan during drought conditions and catastrophic events.

The GCSD encouraged participation in Plan plan by surrounding water management agencies, water retailers, public agencies, and members of the community. The draft UWMP was available for review at the District Office located at 18966 Ferretti Road, Groveland, CA 95321 and as a PDF on the GCSD’s website ([www.gcsd.org](http://www.gcsd.org)) prior to the public hearing. The final 2020 UWMP will also be available at the District Office or as a PDF on the GCSD’s website.

## **CHAPTER 3 – SYSTEM DESCRIPTION**

On August 19, 1953, the GCSD was formed as a special District by the State of California to provide utility services to the Groveland area and later to the communities of Big Oak Flat and Pine Mountain Lake areas. At first, the District tried to meet its growing water needs by tapping into groundwater from flooded mine shafts and tunnels that lay beneath the town. This water was of generally poor quality and contained an abundance of iron and manganese. In 1964 the District secured the rights to pump water from the City and County of San Francisco’s Hetch Hetchy Mountain Tunnel Aqueduct, which runs beneath the GCSD’s service area.

Through the course of its history, the GCSD has primarily served the residential and commercial sectors of the community. GCSD is the owner and operator of the Groveland Water System, which treats and distributes water to the populated areas of Groveland, Big Oak Flat and Pine Mountain Lake. The GCSD’s water supply and distribution system includes three water treatment plants, five storage reservoirs, and approximately 70 miles of distribution piping.

The climate within the GCSD’s service area is characterized by cold, wet winters and very warm, mostly dry summers. The Western Regional Climate Center (WRCC) has maintained historical climate records for the past 100 years for the Groveland area. According to the WRCC, average January temperatures are a maximum of 57.5°F and a minimum of 30.2°F. Average July temperatures are a maximum of 90.8°F and a minimum of 54.2°F. According to WRCC records from the years of 1906 to 2008, the annual precipitation in the GCSD service area averages approximately 37 inches. At an elevation of 2,846 feet, snowfall is a typical occurrence, and the area receives approximately 15 inches per year, mainly during the period of December through May.

In 1990, the GCSD was recognized by the United States Census Bureau (Census) as a community comprised of three cities: Groveland, Big Oak Flat and Pine Mountain Lake (Groveland-Big Oak Flat Census Designated Place (CDP)). For the 1990 Census, the combined population of the Groveland-Big Oak Flat CDP was 2,753 full-time residents. Following the 2000 Census, the U.S. Census Bureau decided to separate Pine Mountain Lake from Groveland-Big Oak Flat CDP due to drastic differences in population size and growth. According to the 2010 Census, the combined population of Groveland-Big Oak Flat CDP and Pine Mountain Lake CDP was 3,397.

According to the most recent population estimate available for the region (2019 American Community Survey (ACS) 5-Year Estimate), the estimated combined population of Groveland-Big Oak Flat CDP and Pine Mountain Lake CDP was approximately 3,019 in 2019. Based on population figures provided by the 1990 Census and the 2019 ACS, the average annual growth rate demonstrated within the GCSD has been approximately 0.32 percent. Based on these population figures, the average annual growth rate since 1990 has been approximately 0.32 percent. Current and projected populations through 2045 are shown in Table LD-2

<b>Table LD-2 Population - Current and Projected (Submittal Table 3-1)</b>						
<b>Population Served</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045</b>
	3,029	3,078	3,127	3,177	3,228	3,280
NOTES: <sup>(1)</sup> Population is based on the U.S. Census 2019 American Community Survey 5-Year Estimate for the total population of both Groveland CDP and Pine Mountain Lake CDP and assumes an annual growth rate of 0.32%.						

<sup>(2)</sup> An annual growth rate of 0.32% is used to project population growth within the GCSD service area through 2045.

## CHAPTER 4 – WATER USE CHARACTERIZATION

This chapter describes and quantifies the GCSD’s current water use and future water use projections through the year 2045. Water use records, combined with projections of population, provide the basis for estimating future water requirements. Water use projections provide in this chapter will allow the GCSD to accurately analyze the use of the water resources and conduct good resource planning. Additionally, the future demand estimates presented in this chapter will allow the GCSD to adequately manage the water supply and appropriately plan their infrastructure investments.

This chapter also details total water demand and potable demand. Water demands refer not only to the water used by customers but also water used as part of the system maintenance and operation, as well as unavoidable losses inherent in the operation of a water distribution system. Total water demand withing the GCSD was approximatley 120 MG per year on average between 2015 and 2019, and 130 MG in 2020. Table LD-3 summarizes the 2020 actual water uses and the projected demand through 2045 in five-year increments. Chapter 4 of this UWMP describes the methodologies and assumptions uses in projected future demands.

<b>Table LD-3 Retail Demands for Potable and Raw Water - Projected</b>						
<b>Use Type</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045</b>
Single Family	94	96	99	104	111	120
Commercial	6	16	16	17	18	20
Other Potable	2	3	3	3	3	3
Losses	27	27	27	27	27	27
<b>TOTAL</b>	<b>130</b>	<b>142</b>	<b>146</b>	<b>151</b>	<b>159</b>	<b>170</b>

Accounting for historical water use, expected population increase and other growth, climatic variability, water conservation, and other assumptions, water demand within GCSD’s service area is projected to increase to 170 MG by 2045, which is an increase of approximatley 42 percent compared to the 2015-2019 average.

## CHAPTER 5 – SB X7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE

The Water Conservation Act of 2009, also known as the SB X7-7, required urban retail water suppliers to set water conservation targets for 2020 to support the overall State goal of reducing urban per capita water use by 20 percent by 2020. As required by the Act, individual supplier conservation targets had to be determined using one of four methods that are based upon a baseline of use that was calculated using the specific guidelines described in DWR’s *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (DWR, 2011).

In the 2010 UWMP, the GCSD calculated its baselines and targets based on the requirements and methodologies at that time. For the 2015 UWMP, the GCSD updated the baselines and targes from the 2010 UWMP to incorporate 2010 Census data as required by the 2015 UWMP Guidebook. In the 2015 UWMP, the GCSD demonstrated compliance with its interim water use target for the year 2015 and

showed that the GCSD was on track to achieve its 2020 target. In Chapter 5 of this 2020 UWMP, the GCSD demonstrates that it has achieved its 2020 target.

## **CHAPTER 6 – WATER SUPPLY CHARACTERIZATION**

The GCSD obtains its sole water supply from the Hetch Hetchy Mountain Tunnel under a 1964 Agreement with the City and County of San Francisco. The Agreement was extended in 1984 and expires on March 23, 2034. Under the terms of the Agreement, GCSD is a retail customer of the City and County of San Francisco.

The supply source for Hetch Hetchy Reservoir is the Tuolumne River. Most of this water supply originates in the upper Tuolumne River Watershed high in the Sierra Nevada Mountain Range, remote from human development and pollution. This pristine water source is protected in tunnels until it gets to the GCSD. The GCSD has been approved to use this drinking water source without requiring filtration. GCSD chlorinates, chloraminates, and treats the water with ultraviolet light disinfection. The water meets the criteria of the Long Term 2 (LT2) surface water supply regulations.

A Water Exchange Agreement was entered into between the SFPUC, the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) on July 23, 2007. The Agreement allows GCSD to use Pine Mountain Lake as its alternative water supply when the SFPUC shuts down the Hetch Hetchy Mountain Tunnel for durations up to 60 days per year for tunnel repair or during emergencies. The volume of water that will be allowed to be used during the shutdowns is 200 acre-feet.

During normal years, the GCSD obtains all of its water supply from the Hetch Hetchy Reservoir. The GCSD does not currently use groundwater as part of its water supply. Groundwater in Tuolumne County is severely limited due to the hard, impermeable bedrock that covers the majority of the County and due to the high naturally occurring iron content of the groundwater. Additionally, the GCSD does not currently have any stormwater recovery or diversion stormwater diversion facilities or desalination facilities. Since the GCSD is not located near the ocean, desalination is not a practical or economically feasible source of water.

GCSD owns and operates the Regional Wastewater System which collects wastewater from about half of the water customers within the principal communities and developed areas within GCSD and transmits it to the Regional Wastewater Treatment Plant for treatment. All treated wastewater (recycled water) from GCSD is then delivered to the Pine Mountain Lake Association’s 18-hole golf course and GCSD’s 14 acres of spray fields.

## **CHAPTER 7 – WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT**

Water supply reliability describes the long-term reliability of the GCSD to meet the water needs of its customers under varying conditions. Chapter 7 describes the GCSD’s reliability to meet customer’s demands through the year 2045 by analyzing plausible hydrological variability, regulatory variability, climate conditions, and other factors that affect the water supply and the customer’s water use. Per the new requirements of the CWC, this chapter presents an assessment of the GCSD’s water supply by comparing projected future demands with expected water suppliers under three different hydrologic condition: normal year; a single dry year; and multiple dry years.

Reliability is expressed in terms of the GCSD's water system to deliver water during normal water years and in years of water supply shortages. Reliability may be quantified by the amount and frequency of water delivery reductions required to balance customer demands with available water supplies. During a normal year, the GCSD obtains its sole water supply from the SFPUC, which is a wholesale water supplier that delivers water to 28 customers in Alameda, Santa Clara, and San Mateo Counties, the City of San Francisco, the Cordilleras Mutual Water Company (MWC) in Redwood City and the GCSD in Tuolumne County. Drought conditions can result in declines in surface water flows which can be detrimental to an areas water supply. However, the SFPUC plans water deliveries under the premise that a drought more severe than the worst drought on record may occur. Based on the GCSD's contract service agreement with the SFPUC and that the GCSD is located on the uppermost portion of the SFPUC's transmission system, this 2020 UWMP concludes that no water supply shortages are anticipated in the GCSD's service area during the planning period.

## **CHAPTER 8 – WATER SHORTAGE CONTINGENCY PLAN**

Water shortage contingency planning is a strategic planning process to prepare for and respond to water shortages. The purpose of a Water Shortage Contingency Plan (WSCP) is to include stages of response to a water shortage, such as a drought, that occur over a period, as well as catastrophic supply interruptions which occur suddenly. The primary objective of a WSCP is to ensure that a supplier has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions.

On March 8, 2010, the GCSD Board of Directors adopted Ordinance 2-10 "Water" (Ordinance 2-10), which established the rules and regulations regarding the provision of water service within the boundaries of the GCSD's service area. As of March 13, 2017, the GCSD Board of Directors adopted Ordinance No. 2-17 to replace Ordinance 2-10 in full. The Ordinance serves to modify and expand upon the rules and regulation of the water system, including water conservation regulations and water shortage contingency measures. Article XVII, "Drought Restriction," sets forth water shortage emergency conditions that exist with the GCSD's boundary as declared by resolution of the Board of Directors.

The 2020 WSCP presented in this Chapter updates the GCSD's previous 2015 WSCP and Article XVII of Ordinance No. 2-17, which included only 4 stages of voluntary and mandatory water conservation measures. For the 2020 WSCP, each of the six water shortage stages represent an increasing gap between the GCSD's estimated water supplies and the unconstrained water demand or the gap between supply and demand at any time due to an unforeseen event that interrupts water supplies. The six shortage stages correspond to 10, 20, 30, 40, 50 percent, and greater than 50 percent shortage compared to the normal reliability conditions, as required by new legislation.

## **CHAPTER 9 – DEMAND MANAGEMENT MEASURES**

The GCSD recognizes water use efficiency as an integral component of current and future water strategy in its service area. Demand management measures (DMMs) refer to policies, programs, rules, regulation and ordinances, and the use of devices, equipment, and facilities that, over the long term, have been generally justified and accepted by the industry as providing the means to achieve a "reliable" reduction in water demand. This means providing education, tools, and incentives to help residents and businesses



reduce the amount of water used on their property. The GCSD has aggressively pursued conservation to reduce demand and stretch existing water supplies.

The UWMPA originally required implementation of fourteen DMMs; also known as best management practices (BMP). In 2014, the section of the CWC addressing DMMs was significantly modified based on recommendations from the Independent Technical Panel (ITP) to the legislature. The ITP recommended that the UWMP Act should be amended to simplify, clarify, and update the DMM reporting requirements, reorganizing the 14 specific measures to six more general requirements plus a “other” category. Urban water suppliers can choose to follow the six general requirements or report by type of DMM.

The GCSD realizes the importance of DMMs to ensure a reliable future water supply. In this 2020 UWMP, the GCSD has reported on the seven DMM described in the 2020 UWMP Guidebook. The DMMs that have been or are planning to be implemented within the GCSD’s water service area are detailed in Chapter 9.

## **CHAPTER 10 – PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION**

During preparation of the 2020 UWMP, the GCSD notified the County of Tuolumne, the SFPUC, the City of Sonora, the Turlock Irrigation District that it was updating their 2015 UWMP in compliance with the 2020 UWMP Guidebook and invited each agency to participate in the process. On \_\_\_\_\_, 2021, a notice of public hearing was mailed, notifying each agency the date and time of the public hearing, contact information, and where the draft UWMP would be available for review. This occurred within the required 60-day notification period prior to the public hearing.

In accordance with Government Code 6066, the notice of the public hearing was also published in the GCSD’s local press to notify the general public. The notice included the date and time of the public hearing, as well as the location where the Plan is available for public inspection.

The 2020 UWMP and WSCP was adopted by Resolution Nos. 35-2021 and 36-2021 on November 9, 2021, following the public hearing. The public hearing gave the general public the opportunity to comment on the Plan and further allowed the GCSD Board of Directors to consider any further modifications of the UWMP in response to public input before adoption.

The UWMP was submitted to the DWR electronically on November 10, 2021, A copy of the UWMP was submitted to the California State Library, County of Tuolumne, and the SFPUC within 30 days of approval of the Plan. Finally, copies of the adopted UWMP were also made available to the public within 30 days following adoption. The public can access an electronic copy of the Plan on the GCSD’s website and also obtain a copy at the District office during normal business hours

## **CHAPTER 1 - INTRODUCTION AND OVERVIEW**

### **1.1. Background and Purpose**

The California Water Code requires all urban water suppliers within the state to prepare and adopt Urban Water Management Plans (UWMP) for submission to the California Department of Water Resources (DWR). The UWMPs must be updated every five years and satisfy the requirements of the Urban Water Management Planning Act (UWMPA) of 1983 including amendments that have been made to the Act. The UWMPA requires urban water suppliers servicing 3,000 or more connections or supplying more than 3,000-acre feet (AF) of water annually, to prepare an UWMP.

The purpose of the UWMP is to maintain efficient use of urban water supplies, continue to promote conservation programs and policies, ensure that sufficient water supplies are available for future beneficial use, and provide a mechanism for response during water drought conditions. This report, which was prepared in compliance with the California Water Code (CWC), and as set forth in the guidelines and format established by the DWR, is the Groveland Community Services District (GCSD) 2020 UWMP.

### **1.2. Urban Water Management Planning and the California Water Code**

Water planning is an essential function of water suppliers, but it is critical as California grapples with ongoing drought and expected long-term climate changes. Prior to the adoption of the UWMPA, there were no specific requirements that water agencies conduct long-term resource planning. While many water agencies had conducted long-term water supply and resource planning prior to the Act, those who had not were left vulnerable to supply disruptions during dry periods or catastrophic events.

#### **1.2.1. Urban Water Management Planning Act of 1983**

In 1983, State Assembly Bill (AB) 797 modified the California Water Code Division 6, by creating the UWMPA. Several amendments to the original UWMPA, which were introduced since 1983, have increased the data requirements and planning elements to be included in 2020 UWMP.

Initial amendments to the UWMPA required that total projected water use be compared to water supply sources over the next 20 years, in 5-year increments. Recent DWR guidelines also suggest projecting through a 25-year planning horizon to maintain a 20-year timeframe until the next UWMP update has been completed and for use in developing Water Supply Assessments.

Other amendments require that UWMPs include provisions for recycled water use, demand management measures, and a Water Shortage Contingency Plan (WSCP), set forth therein. Recycled water was added in the reporting requirements for water usage and figures prominently in the requirements for evaluation of alternative water supplies when future projections predict the need for additional water supplies. Each urban water purveyor must coordinate the preparation of the WSCP with other urban water purveyors in the area, to the extent practicable. Each water supplier must also describe their water demand management measures that are being implemented or scheduled for implementation.

In addition to the UWMPA and its amendments, there are several other regulations that are related to the content of the UWMP. In summary, the key relevant regulations are:

- Chapter 1 - AB 1420: Requires implementation of demand management measures (DMMs)/best management practices (BMPs) and meeting the 20 percent reduction by 2020 targets (mandated by SBx7-7) to qualify for water management grants or loans.
- Chapter 2 - AB 1465: Requires water suppliers to describe opportunities related to recycled water use and stormwater recapture to offset potable water use.
- Chapter 3 - Amendments Senate Bill (SB) 610 (Costa, 2001), and SB 221 (Daucher, 2001), which became effective beginning January 1, 2002, require counties and cities to consider information relating to the availability of water to supply new large developments by mandating the preparation of further water supply planning (Daucher) and Water Supply Assessments (Costa).
- Chapter 4 - SB 1087: Requires water suppliers to report single family residential (SFR) and multifamily residential (MFR) projected water use for planned lower income units separately.
- Chapter 5 - Amendment SB 318 (Alpert, 2004) requires the UWMP to describe the opportunities for development of desalinated water, including but not limited to, ocean water, brackish water, and groundwater, as long-term supply.
- Chapter 6 - AB 105 (Wiggins, 2004) requires urban water suppliers to submit their UWMPs to the California State Library.
- Chapter 7 - SBx7-7: Requires development and use of new methodologies for reporting population growth estimates, base per capita use, and water conservation. This water bill also extended the 2010 UWMP adoption deadline for retail agencies to July 1, 2011.

A copy of the current version of the UWMPA, as incorporated in Sections 10610 through 10657 of the California Water Code (CWC), is provided in Appendix A.

### 1.2.2. Applicable changes to the Water Code since 2015

Table 1-1 provides a summary of the changes to the CWC since 2015:

Table 1-1 Changes to the CWC since 2015			
Topic	CWC Section	Legislative Bill	Summary
Five Consecutive Dry-Year Water Reliability Assessment	Section 10635(a)	SB 606 Hertzberg 2018	The Legislature modified the dry-year water reliability planning from a “multiyear” time period to a “drought lasting five consecutive water years” designation. This statutory change requires a Supplier to analyze the reliability of its water supplies to meet its water use over an extended drought period.
Drought Risk Assessment	Section 10635(b)	SB 606 Hertzberg 2019	The Legislature created a new UWMP requirement for drought planning in part because of the significant duration of recent California droughts and the predictions about hydrological variability attributable to climate change. The Drought Risk Assessment requires a Supplier to assess water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.

<b>Table 1-1 Changes to the CWC since 2015</b>			
<b>Topic</b>	<b>CWC Section</b>	<b>Legislative Bill</b>	<b>Summary</b>
Seismic Risk	Section 10632.5	SB 664 Hertzberg 2015	The Water Code now requires Suppliers to specifically address seismic risk to various water system facilities and to have a mitigation plan.
Energy Use Information	Section 10631.2	SB 606 Hertzberg 2018	The Water Code now requires Suppliers to include readily obtainable information on estimated amounts of energy for their water supply extraction, treatment, distribution, storage, conveyance, and other water uses. The reporting of this information was voluntary in the 2015 UWMP.
Water Loss Reporting for Five Years	Section 10631(d)(3)(C)	AB 1414 Friedman 2019	The Water Code added the requirement to include the past five years of water loss audit reports as part of the 2020 UWMP
Water Shortage Contingency Plan (WSCP)	Section 10632	SB 606 Hertzberg 2019	In 2018, the Legislature modified the UWMP laws to require a WSCP with specific elements. The WSCP is a document that provides a Supplier with an action plan for a drought or catastrophic water supply shortage.
Groundwater Supplies Coordination	Section 10631	AB 1414 Friedman 2019	In 2014, the Legislature enacted the Sustainable Groundwater Management Act (SGMA) to address groundwater conditions throughout California. The Water Code now requires Suppliers' 2020 UWMPs to be consistent with Groundwater Sustainability Plans, in areas where those plans have been completed by Groundwater Sustainability Agencies.
Lay Description	Section 10630.5	SB 606 Hertzberg 2019	The Legislature included a new statutory requirement for Suppliers to include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks.

### **1.2.3. Water Conservation Act of 2009 (SB X7-7)**

With the adoption of the Water Conservation Act of 2009, also known as SB X7-7, the State of California is required to reduce urban per capita water use by 20 percent by the year 2020. To achieve this statewide objective, the Legislature required each urban supplier to report in their 2015 UWMPs their Base Daily per Capita Water Use (Baseline GPCD), 2015 Interim Urban Water Use Target, 2020 Urban Water Use Target (2020 Target), and Compliance Daily per Capita Water Use. The Legislature stated that the cumulative results of each urban supplier's reduction would meet the statewide legislative requirement.

No new requirements were created for water use targets, baselines, or compliance since the 2015 UWMP. However, for this 2020 UWMP, urban suppliers must demonstrate whether they have achieved their 2020 Target as reported in their 2015 UWMP.

### 1.3. Urban Water Management Plan in Relation to Other Planning Efforts

Urban suppliers provide information on water management specific to their service areas. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these plans include City, District and County General Plans, Water Master Plans, Recycled Water Master Plans, integrated resource plans, Integrated Regional Water Management Plans, Groundwater Management Plans, and others.

### 1.4. 2020 UWMP Organization

The information contained in this 2020 UWMP corresponds to items in the UWMPA and other amendments to the Water Code. This 2020 UWMP has been organized following the DWR's recommended outline and the following is a description of each chapter and a brief description of the content in each chapter:

- **Chapter 1 - Introduction and Overview:** This introductory chapter describes the UWMP Act, the UWMP preparation and adoption process, and amendments to the Water Code since the preparation of the 2015 UWMP. This Chapter also provides a discussion on the importance and extent of the GCSD's water management planning efforts.
- **Chapter 2 - Plan Preparation:** This chapter provides information on the process followed for developing the UWMP, including efforts in coordination and outreach.
- **Chapter 3 - System Description:** This chapter includes a general description of the GCSD's water supply system, including a description of the GCSD's service area, climate, projected population, other social, economic, and demographic factors.
- **Chapter 4 - System Water Use:** This chapter describes and quantifies the current and projected water uses within GCSD's service area.
- **Chapter 5 – SB X7-7 Baselines, Targets and 2020 Compliance:** This chapter describes the GCSD's compliance with the 2020 per-capita target value that was adopted in 2015 UWMP and states the GCSD's compliance value based on actual 2020 customer water use.
- **Chapter 6 - System Supplies:** This chapter describes and quantifies the current and projected sources of water available to the GCSD. This chapter also includes a description and quantification of potential recycled water uses and supply availability.
- **Chapter 7 - Water Supply Reliability and Drought Risk Assessment:** This chapter presents an assessment of the reliability of the GCSD's water supply and projects the reliability over a 20 year planning horizon, for normal, single dry years, and five consecutive dry years.
- **Chapter 8 - Water Shortage Contingency Plan:** This chapter provides the GCSD's staged plan for dealing with water shortages, incorporating prescriptive information and standardized action levels, along with implementation actions in the event of a catastrophic supply interruption.
- **Chapter 9 - Demand Management Measures:** This chapter describes the GCSD's efforts to promote conservation and to reduce demand on its water supply and addresses several demand management measures.

- **Chapter 10 - Plan Adoption, Submittal, and Implementation:** This chapter describes the steps taken to adopt and submit the 2020UWMP and to make it publicly available. This chapter also includes a discussion of GCSD’s plan to implement the UWMP.

## CHAPTER 2 - PLAN PREPARATION

### 2.1. Introduction

This chapter provides the basis for preparing the 2020 UWMP and describes the various levels of regional coordination that GCSD has employed. It also describes the reporting period and the units of measure used by GCSD to report water volumes throughout the 2020 UWMP.

Finally, this chapter also provides a description of the coordination and outreach efforts followed in the preparation of the 2020 UWMP. Coordination and outreach are key elements to developing a useful and accurate UWMP.

### 2.2. Basis for Preparing a Plan

#### *CWC Section 10617*

*“Urban water supplier” means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems.*

#### *CWC Section 10620*

*(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.*

#### *CWC Section 10621*

*(a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.*

The GCSD supplies water for municipal purposes to a population of approximately 3,029 through a total of number of 3,256 service connections. Thus, the GCSD is classified as an “urban water supplier” as defined in Section 10617 of the CWC. In accordance with the CWC, as an urban water supplier, the GCSD is required to update its urban water management plan every five years. The GCSD submitted a UWMP to the Department of Water Resources (DWR) in 2010 and 2015. This 2020 UWMP will be the third UWMP submitted by GCSD.

#### 2.2.1. Public Water Systems

##### *CWC Section 10644*

*(a)(2) The plan, or amendments to the plan, submitted to the department ... shall include any standardized forms, tables, or displays specified by the department.*

##### *California Health and Safety Code 116275 (h)*

*“Public Water System” means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.*

GCSO owns and operates a public water system (PWS#5510009) that is regulated by the State Water Resources Control Board, Division of Drinking Water (SWRCB-DDW). The SWRCB-DDW requires reporting on public water systems.

GCSO files electronic Annual Reports to the Drinking Water Program (eARDWP) to the Board, which include annual reports of water usage and other information. The information provided in this UWMP is consistent with the data reported in the eARDWP.

### 2.2.2. Agencies Serving Multiple Service Areas/Public Water Systems

GCSO serves only one PWS. Information about that PWS is shown below in Table 2-1.

<b>Table 2-1 Public Water Systems (Submittal Table 2-1)</b>			
<b>Public Water System Number</b>	<b>Public Water System Name</b>	<b>Number of Municipal Connections 2020</b>	<b>Volume of Water Supplied 2020 (MG)</b>
CA5510009	Groveland Community Services District	3,256	127

### 2.3. Individual or Regional Planning and Compliance

GCSO is the only urban water supplier in the area and a regional planning process seemed unfeasible. While regional reporting is an option in the future, GCSO has chosen Individual Reporting for this 2020 UWMP.

GCSO is a member of the Tuolumne-Stanislaus Integrated Regional Water Management Plan (TS-IRWMP). As a member of TS-IRWMP GCSO anticipates a much greater coordination with other regional water suppliers and users in the near future.

GCSO has developed this 2020 UWMP covering only its agency service area and addressing all requirements of the Water Code. Table 2-2 shows that GCSO has developed an individual UWMP.

<b>Table 2-2 Plan Identification (Submittal Table 2-2)</b>			
<b>Select Only One</b>	<b>Type of Plan</b>		<b>Name of RUWMP or Regional Alliance</b>
<input checked="" type="checkbox"/>	<b>Individual UWMP</b>		
<input type="checkbox"/>	Water Supplier is also a member of a RUWMP		
<input type="checkbox"/>	Water Supplier is also a member of a Regional Alliance		
	<b>Regional Urban Water Management Plan (RUWMP)</b>		

### 2.4. Fiscal or Calendar Year and Units of Measure

*CWC Section 10608.20*

*(a)(1) Urban retail water suppliers...may determine the targets on a fiscal year or calendar year basis.*



### 2.4.1. Fiscal or Calendar Year

Water suppliers may report on either a fiscal or calendar year basis. DWR prefers that agencies report on a calendar year basis in order to ensure UWMP data is consistent with data submitted for other reports to the State. The GCSD is reporting on a calendar year basis. All data included in this 2020 UWMP is consistent with the calendar year basis.

### 2.4.2. Reporting Complete 2020 Data

The 2020 UWMPs are required to include the water use and planning data for the entire calendar year of 2020, if an agency is reporting on a calendar year basis. This 2020 UWMP contains information for the entire 2020 year.

### 2.4.3. Units of Measure

Water agencies use various units of measure when reporting water volumes, such as acre-feet (AF), million gallons (MG), or hundred cubic feet (CCF). Agencies may report volumes of water in any of these units, but must maintain consistency throughout the UWMP. GCSD is reporting water volumes in million gallons (MG). Table 2-3 shows the type of agency, type of reporting year, and the units of measurement used throughout this 2020 UWMP.

Table 2-3 Supplier Identification (Submittal Table 2-3)	
Type of Supplier	
<input type="checkbox"/>	Supplier is a wholesaler
<input checked="" type="checkbox"/>	Supplier is a retailer
Fiscal or Calendar Year	
<input checked="" type="checkbox"/>	UWMP Tables are in calendar years
<input type="checkbox"/>	UWMP Tables are in fiscal years
Units of measure used in UWMP	
Unit	MG

## 2.5. Coordination and Outreach

*CWC Section 10631 (h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

### 2.5.1. Wholesale and Retail Coordination

When a water supplier relies upon a wholesale agency for a water supply, both suppliers are required to provide each other with information regarding projected water supply and demand. The projections should be consistent with each agency's supply and demand projections.

GCSD receives water from the SFPUC. GCSD provided SFPUC with water demand projections and has a copy of the Draft 2020 UWMP for review and comment. Table 2-4 is included below indicating that GCSD has informed SFPUC of projected water use in accordance with CWC 10631.

<b>Table 2-4 Water Supplier Information Exchange (Submittal Table 2-4)</b>	
<b>The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.</b>	
<b>Wholesale Water Supplier Name</b>	
San Francisco Public Utilities Commission	

### 2.5.2. Coordination with Other Agencies and the Community

*CWC Section 10620*

*(d)(3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

*CWC Section 10642*

*Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan...*

In the preparation this 2020 UWMP, the GCSD has coordinated with other appropriate agencies in the area, to the extent practicable. GCSD has contacted with the following agencies in the preparation of this 2020 UWMP.

- San Francisco Public Utilities Commission
- City of Sonora
- Tuolumne County
- Turlock Irrigation District

Copies of the letters sent to each of those agencies are included in Appendix B.

### 2.5.3. Notice to Cities and Counties

*CWC Section 10621(b)*

*Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.*

Agencies must notify cities and counties within which they serve water that the UWMP is being updated and reviewed. As indicated above, the City of Sonora and Tuolumne County have been notified of the preparation of the 2020 UWMP and invited to participate in the process.

## CHAPTER 3 - SYSTEM DESCRIPTION

### 3.1. Introduction

This Chapter provides a general description of the GCSD's water supply system, including a description of the service area, climate, and projected population.

### 3.2. General Description

*CWC Section 10631.*

*(a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.*

The GCSD is a special District formed by the State of California, spanning approximately 15 square miles in southern Tuolumne County, located in the Central Sierra Nevada Mountains. The GCSD's service area is bounded on the north by the Tuolumne River, on the south by Mariposa County, on the east by Stanislaus National Forest, and on the west by Moccasin. The City of Sonora lies approximately 30 miles to the south and the west entrance of the Yosemite National Park is approximately 26 miles to the east. The GCSD's service area consists of three areas of concentrated population: Groveland, Big Oak Flat, and Pine Mountain Lake.

Since the early California Gold Rush days, the Groveland area was a center of gold mining activity. However, from its beginnings the area has not had sufficient water to support these activities. Over the years, many have undertaken efforts to bring water to Groveland and Big Oak Flat and have met with varying and usually limited successes. On August 19, 1953, the Groveland Community Services District was formed to bring much needed utility services to the Groveland area and later (1964) to the Big Oak Flat area. At first, GCSD tried to meet its growing water needs by tapping into groundwater from flooded mine shafts and tunnels that lay beneath the town. This water was of generally poor quality and contained an abundance of iron and manganese. In 1964 GCSD secured the rights to pump water from the City and County of San Francisco's Hetch Hetchy Mountain Tunnel Aqueduct, which runs beneath GCSD's service area.

Through the course of its history, GCSD has primarily served the residential and commercial sectors of the community. GCSD is the owner and operator of the Groveland Water System, which treats and distributes water to the populated areas of Big Oak Flat, Groveland, and Pine Mountain Lake. The GCSD's water supply and distribution system includes three water treatment plants, five storage reservoirs, and approximately 71 miles of distribution piping. According to the U.S. Census 2019 American Community Survey 5-Year Estimate, the Groveland CDP and Pine Mountain Lake areas boasts a combined population

of approximately 3,019 full-time residents. However, this number often triples during the summer months, as visitors are attracted to both the areas surrounding beauty and may recreation opportunities that are offered nearby.

### 3.3. Service Area Maps

A Service Area Map is included in Appendix C of this 2020 UWMP. The service area map contains the boundaries of the GCSD’s service area, which includes the potable water service area boundary.

### 3.4. Service Area Climate

*CWC Section 10631(a)*

*A plan shall... Describe the service area of the supplier, including ... climate...*

*CWC Section 10630*

*It is the intention of the Legislature, in enacting this part, to permit levels of water management planning... while accounting for impacts from climate change.*

The climate within the GCSD’s service area is characterized by cold, wet winters and very warm, mostly dry summers. The Western Regional Climate Center (WRCC) has maintained historical climate records for the past 100 years for the Groveland area. According to the WRCC, average January temperatures are a maximum of 57.5°F and a minimum of 30.2°F. Average July temperatures are a maximum of 90.8°F and a minimum of 54.2°F. According to WRCC records from the years of 1906 to 2008, the annual precipitation in the GCSD service area averages approximately 37 inches. At an elevation of 2,846 feet, snowfall is a typical occurrence, and the area receives approximately 15 inches per year, mainly during the period of December through May.

Similar to the WRCC, the California Irrigation Management Information System (CIMIS) web site tracks and maintains records of evapotranspiration (ET<sub>o</sub>) for select cities only. Since there are no CIMIS stations located in Tuolumne County, the ET<sub>o</sub> statistics used for Groveland come from the foothill region. It assumed that the foothill region stations (Camino, Browns Valley, Auburn, Plymouth, and Diamond Springs) will be representative of the Groveland distribution area. Table 3-1 below displays the average monthly precipitation, maximum and minimum average temperatures, and average evapotranspiration within the GCSD service area.

Month	Avg. Precipitation (in) <sup>(1)</sup>	Avg. Snowfall (in) <sup>(1)</sup>	Avg. Max Temp (°F) <sup>(2)</sup>	Avg. Min Temp (°F) <sup>(2)</sup>	Avg. Et <sub>o</sub> (in) <sup>(3)</sup>
January	7.34	3.4	57.5	30.2	1.42
February	6.72	2.7	53.8	31.3	2.02
March	5.35	3.3	58.6	34.8	3.16
April	3.31	2.1	64.2	38.6	4.65
May	1.21	0.1	72.3	44.1	6.18
June	0.37	0.0	86.5	55.1	7.57
July	0.06	0.0	90.8	54.2	8.29

**Table 3-1 Climate Data**

Month	Avg. Precipitation (in) <sup>(1)</sup>	Avg. Snowfall (in) <sup>(1)</sup>	Avg. Max Temp (°F) <sup>(2)</sup>	Avg. Min Temp (°F) <sup>(2)</sup>	Avg. Et <sub>o</sub> (in) <sup>(3)</sup>
August	0.13	0.0	86.6	51.2	7.58
September	0.59	0.0	84.4	66.4	5.59
October	1.64	0.0	71.1	38.7	3.78
November	4.62	0.7	60.4	31.5	1.86
December	5.92	2.9	65.2	27.2	1.23
<b>Annual Total/Average</b>	<b>37.26</b>	<b>15.2</b>	<b>71.0</b>	<b>41.9</b>	<b>53.33</b>

NOTES:  
<sup>(1)</sup> Data obtained from the WRCC based on records from 1906 through 2008 for the Tuolumne Groveland RS, California COOP Station (043672).  
<sup>(2)</sup> For the months of January, June through December, data obtained from the WRCC based on records from 1906 through 2008 for the Tuolumne Groveland RS, California COOP Station. For the months of February through May, obtained from the WRCC based on records from 1905 through 1954 for the Groveland, California COOP Station (043666).  
<sup>(3)</sup> Data obtained from the CIMIS, for the foothill region stations of Camino, Browns Valley, Auburn, Plymouth, and Diamond Springs.

### 3.5. Service Area Population and Demographics

#### 3.5.1. Service Area Current and Projected Population

*CWC Section 10631(a)*

*Describe the service area of the supplier, including current and projected population ...The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.*

In 1990, the GCSO was recognized by the United States Census Bureau (Census) as a community comprised of three cities: Groveland, Big Oak Flat and Pine Mountain Lake (Groveland-Big Oak Flat Census Designated Place (CDP)). For the 1990 Census, the combined population of the Groveland-Big Oak Flat CDP was 2,753 full-time residents. According to the 2000 Census, the combined population of Groveland-Big Oak Flat CDP was 3,388 full-time residents. Following the 2000 Census, the U.S. Census Bureau decided to separate Pine Mountain Lake from Groveland-Big Oak Flat CDP due to drastic differences in population size and growth. According to the 2010 Census, the combined population of Groveland-Big Oak Flat CDP and Pine Mountain Lake CDP was 3,397 (601 + 2,796).

Table 3-2 shows the Groveland-Big Oak Flat CDP total population counts for years 1990, 2000, and 2010 and the observed annual growth rates between 1990 and 2000 and between 2000 and 2010.

<b>Table 3-2 US Census Population and Observed Annual Growth</b>			
Year	1990	2000	2010
Groveland-Big Oak Flat CDP	2,753	3,388	3,397

**Table 3-2 US Census Population and Observed Annual Growth**

Year	1990	2000	2010
Annual Growth rate		2.10%	0.03%

The most recent population estimate available for the region was obtained from the 2019 American Community Survey (ACS) 5-Year Estimate. According to the 2019 ACS, the estimated combined population of Groveland-Big Oak Flat CDP and Pine Mountain Lake CDP was approximately 3,019 (247 + 3,019). Based on these population figures, the average annual growth rate since 1990 has been approximately 0.32 percent. Table 3-3 shows the population projections for GCSD’s service area through year 2045 in five-year increments.

**Table 3-3 Population - Current and Projected (Submittal Table 3-1)**

Population Served	2020	2025	2030	2035	2040	2045
	3,029	3,078	3,127	3,177	3,228	3,280

NOTES:  
 (1) Population is based on the U.S. Census 2019 American Community Survey 5-Year Estimate for the total population of both Groveland CDP and Pine Mountain Lake CDP and assumes an annual growth rate of 0.32%.  
 (2) An annual growth rate of 0.32% is used to project population growth within the GCSD service area through 2045.

For this 2020 UWMP, an annual growth rate of 0.32 percent is used to project population growth within the GCSD’s service area. The GCSD boundaries are unlikely to expand in the near future, as most growth is expected to take place within the undeveloped areas of Pine Mountain Lake. Historical data indicates a projected population growth rate of 0.32 percent. Little growth is anticipated for the areas of Groveland and Big Oak Flat. Future growth within the Pine Mountain Lake area is not expected to have a significant effect on the distribution system within Big Oak Flat and Groveland.

### 3.5.2. Other Social, Economic and Demographic Factors

*CWC Section 10631*

*(a) Describe the service area of the supplier, including... other social, economic and demographic factors affecting the supplier’s water management planning.*

Based on 2015-2019 data provided by the 2019 ACS, the Census estimates the current population within the Groveland-Big Oak Flat CDP to be 247, of which, 100 percent of the population is 18 years or older and 32.4 percent is 65 years or older. Approximately 5.3 percent of the population consists of veterans, all of which are male. The median age of a resident in the Groveland-Big Oak Flat CDP is approximately 54 years old.

According to the 2015-2019 Census data, approximately 100 percent of the population within the Groveland-Big Oak Flat CDP have graduated from high school or received a higher education; 25.5 percent have received their high school diploma or equivalent degree, 49.8 percent have received some college experience but no degree, 2.4 percent have received an associate degree, 18.2 percent have received a bachelor’s degree, and 4 percent have received a graduate or professional degree. A Median Household

Income (MHI) was not available for the Groveland-Big Oak Flat CDP; however, the Census estimated the poverty rate to be approximately 11.3 percent.

The Census reported that of the people of the Groveland-Big Oak Flat CDP that identify as one race alone, 97.6 percent were White. The remaining 2.4 percent of the population identified as Asian alone. Approximately 39.7 percent of the population within the Groveland-Big Oak Flat CDP suffer from a disability. According to the Census data, approximately 39.7 percent of the population suffers from a disability, of which, 9.3 percent have a hearing difficulty, 11.7 percent have a vision disability, 13 percent have a cognitive disability, 11.7 percent have an ambulatory disability, 11.7 percent have a self-care disability, and 11.7 percent have an independent living disability.

For the Pine Mountain Lake CDP, the 2015-2019 Census data estimates the current population to be approximately 2,772, of which, approximately 87.7 percent is 18 years or older and 47 percent is 65 years or older. Approximately 4.4 percent of the population with the Pine Mountain Lake CDP is under 5 years old. Veterans consist of 17.1 percent of the population, with 96.8 percent male and 3.2 percent female. The median age of a resident in the Pine Mountain Lake CDP is 63.8.

According to the 2015-2019 Census data, approximately 93.3 percent of the population within the Pine Mountain Lake CDP have graduated from high school or received a higher education; 25.5 percent have received their high school diploma or equivalent degree, 28.8 percent have received some college experience but no degree, 8.5 percent have received an associate degree, 21 percent have received a bachelor's degree, and 9.5 percent have received a graduate or professional degree. The Census estimates the MHI within the Pine Mountain Lake CDP to be approximately \$56,667 and the poverty rate 11.7 percent.

The Census reported that of the people of the Pine Mountain Lake CDP that identify as one race alone, 91.6 percent were White, 3.9 percent were American Indian and Alaska Native alone, and 1.4 percent were Asian alone. Only 2.8 percent of the population identified as two or more races. According to the Census data, approximately 22.6 percent of the population suffers from a disability, of which, 6.5 percent have a hearing difficulty, 4.6 percent have a vision disability, 9.4 percent have a cognitive disability, 14.4 percent have an ambulatory disability, 3.5 percent have a self-care disability, and 7.6 percent have an independent living disability.

### **3.6. Land Uses Within Service Area**

Land use zoning within the GCSD's service area is stipulated by the Tuolumne County General Plan. The Tuolumne County Geographical Information System (GIS) periodically updates the land uses within the County. These are accessible through the County's website. According to the Tuolumne County GIS, land uses within the GCSD include general commercial, public, light industrial, high density residential, medium density residential, low density residential, rural residential, homestead residential, mixed use, open space, and park and recreation.

## CHAPTER 4 - WATER USE CHARACTERIZATION

### 4.1. Introduction

This chapter describes and quantifies the GCSD’s current water use and future water use projections through the year 2045, as based on currently available information. Water use records, combined with projections of population, provide the basis for estimating future water requirements. The data provided in this chapter will allow the GCSD to accurately analyze the use of the water resources and conduct good resource planning. The future demand estimates presented in this chapter will allow the GCSD to adequately manage the water supply and appropriately plan their infrastructure investments. The terms “water use” and “water demand” will be used interchangeably. These terms will also be used to refer to all the demand sectors listed in Section 4.2.

### 4.2. Non-Potable Versus Potable Water Use

The GCSD’s potable water supply is exclusively surface water obtained from the Hetch Hetchy Mountain Tunnel under an Agreement with the SFPUC. Recycled water produced by GCSD’s Wastewater Treatment Plant (WWTP) is used only to irrigate the Pine Mountain Lake Association’s golf course and spray fields owned by the GCSD.

### 4.3. Past, Current, and Projected Water Use by Sector

*CWC Section 10635.*

*(a) Every urban water Supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

*Section 10631(d)*

*(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following...*

*(2). The water use projections shall be in the same five-year increments described in subdivision (a).*

*(4)(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

*(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following: (i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections. (ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances,*



*or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.*

This 2020 UWMP includes past, current, and projected water use in five-year increments. The GCSD will determine the reliability of their projected water supply based upon that information.

#### **4.3.1. Water Use Sectors Listed in Water Code**

*CWC Section 10631(d)*

*(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:*

*(A) Single-family residential.*

*(B) Multifamily.*

*(C) Commercial.*

*(D) Industrial.*

*(E) Institutional and governmental.*

*(F) Landscape.*

*(G) Sales to other agencies.*

*(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.*

*(I) Agricultural.*

*(J) Distribution system water loss.*

This 2020 UWMP also identifies the water use by sector. The GCSD's breaks down metered water deliveries into the following water demand sectors as listed below, per the CWC. The number of water service accounts and volume of water severed provides insight into the different customer's water use, which can be useful in defining effective water conservation measures. Tables 4-3 and 4-5 provide the GCSD's actual 2020 water demands, and projected water demands through 2045.

- Single-Family Residential – A single-family dwelling unit is a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling. Single-family residential water demands are included in retail demands.
- Commercial – Commercial users are defined as water users that provide or distribute a product or service. Commercial water demands are included in retail demands.
- Distribution System Losses – Reporting distribution system losses is required by the CWC. Distribution system losses are discussed further in Section 4.3.4.

For this 2020 UWMP, the following sectors are not applicable to the GCSD's water service area:

- Multi-family Residential
- Industrial

- Institutional/Governmental
- Landscape
- Sales to Other Agencies
- Conjunctive Use
- Groundwater Recharge
- Saline Water Intrusion Barriers
- Agricultural

#### 4.3.2. Water Use Sectors in Addition to Those Listed in Water Code

To provide clarity, the following water use sectors are also not applicable to the GCSD’s UWMP:

- Exchanges
- Surface Water Augmentation
- Transfers
- Wetlands or Wildlife Habitat

According to the GCSD’s annual water audit reports from 2016 to 2019, approximately 2 to 3 MG per year is used for flushing activities (directional flushing program, auto flushers and tank cleaning). This type of water usage is considered unbilled, metered authorized consumption that is derived from the summation of manual meter reads calculated from flushing volumes. For this 2020 UWMP, this type of water usage is classified as “other potable.”

#### 4.3.3. Past Water Use

Table 4-1 summarizes the GCSD’s water usage by water use sector over the past 5 years. These historical volumes are consistent with those presented in the 2015 UWMP and annual water audit reports submitted to the DWR for the years of 2016 to 2019.

<b>Table 4-1 Historical Water Use by Sector</b>					
<b>Use Type</b>	<b>Water Use (MG)</b>				
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Single Family	81	87	90	96	87
Commercial	6	8	7	7	8
Other	0	3	3	3	3
Losses	32	28	19	11	19
<b>TOTAL</b>	<b>119</b>	<b>125</b>	<b>118</b>	<b>118</b>	<b>118</b>

#### 4.3.4. Distribution System Water Losses

*CWC Section 10631(d)(1)*

*For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following...*

*(J) Distribution system water loss....*

*CWC Section 10631(d)(3)*

*(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.*

*(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.*

*(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.*

Water distribution system losses are the difference between the actual volume of water treated and delivered into the distribution system and the actual metered consumption. Such apparent losses are always present in a water system due to pipe leaks, unauthorized connections or use, faulty meters, systematic data handling errors, and unmetered services such as water used for dust control for construction activities, fire protection and training.

New regulations require retail water suppliers to include potable distribution system water losses for the preceding five years. Historically, the GCSD has used the American Water Works Association (AWWA) method to annually evaluate its distribution system losses each calendar year. The GCSD has submitted annual water audit reports to the DWR since 2016. A copy of the GCSD annual water reports from 2016 to 2019 are included in Appendix D.

Table 4-2 summarizes the water distribution system losses for the last five years. The most recent 12-month period began on January 1, 2019.

<b>Table 4-2 Last Five Years of Water Loss Audit Reporting (Submittal Table 4-4)</b>	
<b>Reporting Period Start Date</b>	<b>Volume of Water Loss<sup>(1)</sup></b>
01/2015	32
01/2016	28
01/2017	19
01/2018	12
01/2019	19
NOTES: <sup>(1)</sup> Includes a combination of unbilled/unmetered authorized consumption, apparent losses and real losses as reported in the GCSD's water audit reports.	

To reduce real and apparent losses in future years, the GCSD is looking into resolving issues with the existing SCADA system that is currently prohibiting the automatic datalogging of the water supply meter readings. Additionally, the GCSD will continue to conduct meter calibration on the water supply meter at least on an annual basis. For customer meters, the GCSD is currently seeking grant funding to replace the existing system with Automatic Metering Reading (AMR) system, that will transfer customer meter readings through the implementation of a fixed network.

#### 4.3.5. Current Water Use

The GCSD’s actual potable water demands for the 2020 calendar year are reported in Table 4-3. Losses are calculated by subtracting the amount of treated water that enters the distribution system by the total amount of authorized consumption, which includes water that is classified as billed metered and unbilled metered consumption. For the 2020 calendar year, water losses accounted for approximately 21 percent of the water that was treated and distributed

<b>Table 4-3 Demands for Potable Water - Actual (Submittal Table 4-1)</b>			
<b>Use Type</b>	<b>2020 Actual</b>		
	<b>Additional Description</b>	<b>Level of Treatment When Delivered</b>	<b>Volume (MG)</b>
Single Family	3,158 Metered Connection	Drinking Water	94
Commercial	98 Metered Connection	Drinking Water	6
Other Potable	Potable Water uses for flushing activities, tank cleaning, ect.	Drinking Water	2
Losses	Unaccounted Water	Drinking Water	27
<b>TOTAL</b>			<b>130</b>

#### 4.3.6. Projected Water Use

*CWC Section 10635 (a).*

*Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

*CWC Section 10631*

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available... The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier’s plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

*CWC Section 10631(d)(4)*

*(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

Table 4-4 lists the projected number of connections by user type. The number of connections were projected by first multiplying the total number of metered accounts for 2020 by the annual average growth rate of 0.32 percent growth rate, which is consistent with the population growth rate determined in Section 3.5.1 of this UWMP. For the GCSD’s single family and commercial connections, the projected number of connections was then divided by a factor of 3, since there are typically 3 persons per connections.

Use Type	2025	2030	2035	2040	2045
Single Family	3,175	3,192	3,209	3,227	3,245
Commercial	104	110	118	128	140
<b>TOTAL</b>	<b>3,279</b>	<b>3,302</b>	<b>3,328</b>	<b>3,355</b>	<b>3,385</b>

Table 4-5 lists the projected water demands through years 2045. Projected water demands for single family residential users were obtained by multiplying the GCSD’s annual average growth rate of 0.32 percent by the user’s 2020 annual water consumption. For commercial users, it has been assumed that the GCSD will provide water service to the proposed Yonder Yosemite Hospitality Project (Yonder Yosemite Lodge), which includes the construction of 150 free-standing guest suites that range in size from 325 to 340 square feet. It is estimated that the Yonder Yosemite Lodge will use approximately 9.52 MG per year to provide water to the 150 guest suites, the main lodge, a restaurant, a management residence, a pool and pool house and for landscape irrigation. Additionally, 180,000 gallons will be needed to maintain fire flow. The projected demand for commercial users was obtained by multiplying the annual average growth rate of 0.32 percent by the summation of the estimated annual water demand for the Yonder Yosemite Lodge and the actual 2020 water demand of GCSD’s existing commercial users. For other potable uses and water losses, it has been assumed that these use types will remain constant.

Use Type	Projected Water Use (MG)				
	2025	2030	2035	2040	2045
Single Family	96	99	104	111	120
Commercial <sup>(1)</sup>	16	16	17	18	20
Other Potable	3	3	3	3	3
Losses	27	27	27	27	27
<b>TOTAL</b>	<b>142</b>	<b>146</b>	<b>151</b>	<b>159</b>	<b>170</b>

<b>Table 4-5 Use for Potable Water - Projected (Submittal Table 4-2)</b>	
NOTES:	
<sup>(1)</sup> Includes the projected water demand for the Yonder Yosemite Lodge, which assumes an annual demand of 9.5 MG plus 180,000 gallons for fire-flow protection.	

The GCSD’s projected water demands through the year 2045 are summarized in Table 4-6.

<b>Table 4-6 Total Water Use (Potable and Non-Potable) (Submittal Table 4-3)</b>						
	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045</b>
Potable Water, Raw, Other Non-potable	130	142	146	151	159	170
Recycled Water Demand	0	0	0	0	0	0
<b>TOTAL WATER USE</b>	<b>130</b>	<b>142</b>	<b>146</b>	<b>151</b>	<b>159</b>	<b>170</b>

### 4.3.7. Characteristic Five-Year Water Use

*CWC Section 10635(b)*

*Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following...*

*(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period. [Emphasis added]*

*(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

A critical component of the new statutory language included in CWC Section 10635(b) is the requirement to prepare the five-year Drought Risk Assessment (DRA), which is found in Chapter 7 of this 2020 UWMP. This five-year DRA can also be used to provide the water service reliability assessment for a drought lasting five years. As a first step of the DRA, the DWR recommends that the expected gross water use for the next five years without drought conditions, also known as unconstrained demand, be estimated. Chapter 7 details the DRA, but the GCSD’s unconstrained demand projections over the next five years are summarized in Table 4-7. These projections were developed by applying an annual increase of 1.86 percent, which is demonstrated between the actual 2020 water demands and the 2025 projected water demands presented in Tables 4-5 and 4-6 above.

<b>Table 4-7 Five-Year Water Use - Projected</b>					
<b>Use Type</b>	<b>Projected Water Use (MG)</b>				
	<b>2021<sup>(1)</sup></b>	<b>2022<sup>(1)</sup></b>	<b>2023<sup>(1)</sup></b>	<b>2024<sup>(1)</sup></b>	<b>2025</b>
Potable Water	132	134	137	139	142
NOTES:					
<sup>(1)</sup> An annual increase of 1.86 percent is applied from the previous year’s water usage.					

#### 4.4. Water Use for Lower Income Households

*Section 10631.1.*

*(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.*

*California Health and Safety Code Section 50079.5 (a)*

*“Lower income households” means persons and families whose income does not exceed the qualifying limits for lower income families... In the event the federal standards are discontinued, the department shall, by regulation, establish income limits for lower income households for all geographic areas of the state at 80 percent of area median income, adjusted for family size and revised annually.*

Urban water suppliers are required to identify water demand required for lower income housing in its water use projections. Pursuant to Government Code Section 65589.7, it is GCSD’s policy to grant a priority to those developments seeking water or sewer service which include housing units affordable to lower income households. To further this policy, GCSD adopted the procedures described below.

GCSD will not deny or condition the approval of an application for services to, or reduce the amount of service for, a proposed development that includes housing units affordable to lower income households unless GCSD makes a specific written finding that the denial, condition, or reduction is necessary due to the existence of one or more of the following:

1. GCSD does not have "sufficient water supply" as defined in paragraph (2) of subdivision (a) of Section 66473.7, or is operating under a water shortage emergency as defined in Section 350 of the Water Code, or does not have sufficient water treatment or distribution capacity to serve the needs of the proposed development, as demonstrated by a written engineering analysis and report.
2. GCSD is subject to a compliance order issued by the SWRCB-DDW that prohibits new water connections.
3. If the proposed development seeks sewer service, and if GCSD does not have sufficient collection treatment or reclamation capacity, as demonstrated by a written engineering analysis and report on the condition of the collection treatment, or reclamation works, to serve the needs of the proposed development.
4. If the proposed development seeks sewer service, and if GCSD is under an order issued by the Regional Water Quality Control Board that prohibits new sewer connections.
5. If the applicant fails to agree to reasonable terms and conditions relating to providing service generally applicable to development projects seeking service from GCSD, including but not limited to the requirements of local, state, or federal laws, and regulations or payment of a fee or charge.

For the purposes of this Section, the following definitions apply:

1. "Proposed developments that include housing units affordable to lower income households" means that dwelling units will be sold or rented to lower income households, as defined in Section 50079.5 of the Health and Safety Code, at an affordable housing cost, as defined in Section

50052.5 of the Health and Safety Code, or an affordable rent, as defined in Section 50053 of the Health and Safety Code.

2. "Water or sewer services" means supplying service through a pipe or other constructed conveyance for a residential purpose and does not include the sale of water for human consumption by a water supply to another water supplier for resale. As used in this section, "water service" provided by a public agency applies only to water supplied from public water systems subjected to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

All proposed development projects including housing units affordable to lower income households, to which none of the above exceptions apply, will be required to submit a cover sheet outlining both the number and percentage basis number of housing units affordable to lower income households included in the proposal.

<b>Table 4-8 Inclusion in Water Use Projections (Submittal Table 4-5)</b>	
<b>Are Future Water Savings Included in Projections?</b>	No
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	
<b>Are Lower Income Residential Demands Included In Projections?</b>	Yes

#### 4.5. Climate Change Considerations

DWR Guidelines recommend that the 2020 UWMP include a discussion of potential climate change impacts on projected demand. There is mounting scientific evidence that global climate conditions are changing and will continue to change as a result of the continued build-up of greenhouse gases (GHGs) in the Earth's atmosphere. Changes in climate can affect municipal water supplies through modifications in the timing, amount, and form of precipitation, as well as water demands and the quality of surface runoff. These changes can affect all elements of water supply systems, from watersheds to reservoirs, conveyance systems, and treatment plants.

Indications of climate change have been observed over the last several decades throughout California. Statewide average annual temperatures have risen by approximately 2°F since the early 20<sup>th</sup> century. Although the State's weather has followed the expected pattern of a largely Mediterranean climate throughout the past century, no consistent trend in the overall amount of precipitation has been detected, except that a larger proportion of total precipitation is falling as rain instead of snow.

The correlation between temperature and water demand is well documented and understood. GCSD's largest percentage of the water demand is driven by outdoor irrigation. Higher temperatures will increase evapotranspiration rates and increase demands. Higher temperatures will also extend the duration of the outdoor landscaping growing season increasing the maximum day demands on the spring and fall seasons.

It is evident that climate change adds new uncertainties to the challenges of planning. Changes in weather could significantly affect water supply planning. Since climatic pressures could potentially affect supply reliability, continual attention to this issue will be necessary in the future.



## **CHAPTER 5 - SB X7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE**

### **5.1. Introduction**

In November 2009, the Water Conservation Act of 2009, also known as the SB X7-7, was signed into law as part of a comprehensive water legislation package. This legislation addressed both urban and agricultural water conservation and set a goal of achieving a 20 percent statewide reduction in urban per capita water use by December 31, 2020. To meet the urban water use target requirement, each retail supplier was required to determine its baseline water use, as well as its target water use for the year 2020. Water use is measured in gallons per capita per day (GPCD).

In the 2010 UWMP, the GCSO calculated its baselines and targets based on the requirements and methodologies at that time. For the 2015 UWMP, the GCSO updated the baselines and targets from the 2010 UWMP to incorporate 2010 Census data and updated population projections as required by the 2015 UWMP Guidebook. In the 2015 UWMP, the GCSO demonstrated compliance with its interim water use target for the year 2015 and showed that the GCSO was on track to achieve its 2020 target.

This chapter provides a review of the methodology the GCSO used to calculate its 2020 Urban Water Use Target (2020 Target), its baseline, and how the baseline was calculated. This chapter demonstrates that the GCSO has achieved its 2020 Target. Compliance with the urban water use target requirement is verified in the SB X7-7 2020 Compliance Form, which is included as Appendix E in this plan.

For additional details on how the per capita goals were established refer to the GCSO's 2015 UWMP.

### **5.2. Overview and Background**

The GCSO's compliance with SB X7-7 was first addressed in their 2010 UWMP, in which the GCSO determined its baseline per capita water use and established and adopted its urban water use targets for 2015 and 2020. Actual water use data and population figures provided by the Census and Department of Finance (DOF) were used to calculate GPCD water use. In the 2015 UWMP, the GCSO updated the baselines and targets from the 2010 UWMP to incorporate Census data and updated population projections as required by the 2015 UWMP Guidebook. The GCSO demonstrated that it successfully achieved its 2015 interim target and confirmed its 2020 Target in its 2015 UWMP.

### **5.3. General Requirements for Baseline and Targets**

SB X7-7 required each urban water retailer to determine its baseline daily per capita water use over a 10-year or 15-year baseline period. The 10-year baseline period is defined as a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010. SB X7-7 also defined that urban water retailers that met at least 10 percent of their 2008 water demand using recycled water could extend the baseline GPCD calculation for a maximum of a continuous 15-year baseline period, ending no earlier than December 31, 2004 and no later than December 31, 2010. Since the GCSO did not use recycled water to meet any of their 2008 water demand, the baseline GPCD was calculated over a 10-year period. In their 2015 UWMP, the GCSO selected the 10-year baseline period from 2001 through 2010. SB X7-7 and DWR provided four different methods for calculating an urban water retailer's 2020 Target.

Three of these methods are defined in CWC Section 10608.20(a)(1), and the fourth method was developed by DWR. The 2020 Target may be calculated using one of the following four methods:

- Method 1: 80 percent of the GCSD’s base daily per capita water use;
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and commercial, industrial, and institutional uses;
- Method 3: 95 percent of the applicable State hydrologic region target as stated in the State’s April 30, 2009, Draft 20x2020 Water Conservation Plan; or
- Method 4: An approach that considers the water conservation potential from: 1) indoor residential savings, 2) metering savings, 3) commercial, industrial, and institutional savings, and 4) landscape and water loss savings.

In their 2015 UWMP, the GCSD selected Method 1 to calculate its 2020 Target.

#### 5.4. Service Area Population

To correctly calculate its compliance year GPCD, the GCSD must determine the population that it served in 2020. During the preparation of this UWMP, the 2020 Census results were unavailable. The most recent population estimate available for the region was obtained from the 2019 ACS 5-Year Estimate. According to the 2019 ACS, the estimated combined population of Groveland-Big Oak Flat CDP and Pine Mountain Lake CDP was approximately 3,019 (247 + 3,019). The GCSD’s 2020 population of 3,029 was estimated by multiplying the 2019 population estimate by the average annual growth of 0.32 percent, as determined in Section 3.5.1 of this UWMP.

#### 5.5. Gross Water Use

As defined in CWC Section 10608.12(h), annual gross water use is the water that enters a supplier’s distribution system over a 12-month period, with certain exclusions. The GCSD’s gross water use includes all surface water that was purchased from the SFPUC, treated, and pumped into the GCSD’s distribution system during calendar year 2020. The GCSD’s actual gross water use for 2020 was 130 MG, as reported in Chapter 4 of this UWMP

#### 5.6. Baseline and Targets Summary

Annual gross water use is divided by annual service area population to calculate the annual per capita water use for each year in the baseline periods. As previously stated, the GCSD updated its population data, adjusted its baseline, and confirmed its 2020 Target in its 2015 UWMP. The GCSD 10-year base daily per capita water use is 133 gpcd. Using Method 1 for 2020 Target calculation as described in Section 5.3, the GCSD’s confirmed 2020 compliance target is 107 GPCD. The GCSD’s baseline and 2020 Target are summarized in Table 5-1.

<b>Baseline Period</b>	<b>Start Year</b>	<b>End Year</b>	<b>Average Baseline (GPCD)</b>	<b>Confirmed 2020 Target (GPCD)</b>
10-15 year	2001	2010	133	107
5 Year	2006	2010	133	

## 5.7. 2020 Compliance Daily Per Capita Water Use

This section presents the procedure used to meet the requirements of SB X7-7 as defined in the Water Conservation Act of 2009.

### 5.7.1. 2020 Adjustments for Factors Outside of Supplier's Control

*CWC Water Code Section 10608.24*

*(d)(1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:*

*(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.*

*(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.*

*(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.*

*(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.*

As discussed in Sections 5.4 and 5.5, the estimated population within the GCSD's service area in 2020 was approximately 3,029 and the annual gross water use by the GCSD during 2020 was 130 MG. As the result, the GCSD's per capita water use during 2020 was 117 GPCD. However, due to several unforeseen circumstances, the GCSD has made two adjustments to account for water used for fire suppression and the substantial increase in residential water usage due to the COVID-19 pandemic.

According to staff, the GCSD supplied approximately 300,000 gallons of water to CALFire in 2020 to assist with the Moc Fire. From August 20, 2020, to August 30, 2020, the Moc Fire burned approximately 2,857 acres between Highway 49 and Highway 120 in Moccasin, a town in Tuolumne County. During this 10-day period, the GCSD supplied 15 truck loads of water. It is estimated that each truck holds 2,000 gallons; therefore, the GCSD supplied approximately 0.27 GPCD of water for fire suppression in 2020. As shown in Table 5-2, 0.27 GPCD is included in the 2020 total adjustment.

As previously stated, the Groveland, Big Oak Flat, and Pine Mountain Lake areas boasts a combined population of approximately 3,029 full-time residents. However, due to the number of vacation homes in the area, population within the GCSD often triples during the summer months, due to a significant number of visitors that occupy vacation homes and rental properties. Additionally, the creation of Airbnb in recent years, an online service that allows homeowners to rent out their homes, cabins, or condos, has resulted in an increase of residential water use, especially in 2020.

Due to the COVID-19 pandemic, the GCSD believes that residential water usage increased significantly due to part-time residents from urban areas moving into their vacation homes on a full-time basis. Additionally, as a result of the shutdown of hotel operations due State mandates, the GCSD believes that rentals and Airbnb's were utilized more in 2020 than in previous years. For example, in 2019, the annual

gross water usage was 117.6 MG and the population within the GCSD was approximately 3,019. Therefore, the GCSD’s per capita water use during 2019 was 107 GPCD, which would meet the confirmed 2020 compliance target.

Since the GCSD was on track to meet the confirmed 2020 compliance target in 2019, the GCSD has included approximately 11.91 GPCD in the 2020 total adjustment to account for additional water used by vacation homes and rentals during the 2020 COVID-19 pandemic. This adjustment was determined by first calculating the percentage increase in gross water usage from 2019 to 2020, which was determined to be approximately 10.2 percent. This percentage increase was then multiplied by 2020 gross water usage of 130 MG, which calculated the additional water usage to be approximately 13.2 MG. The daily per capita water use was then determined by dividing the 13.2 MG of water by an estimated population of 3,029 and 365 days.

### 5.7.2. 2020 Compliance Daily Per Capita Water Use

As stated in the previous section, the GCSD has included approximately 12.18 GPCD in the 2020 total adjustment, which includes 0.27 GPCD for water used for fire suppression in 2020 and 11.91 GPCD for the amount of additional water that was used by vacation homes and rentals during the 2020 COVID-19 pandemic. As shown in Table 5-2, the adjusted 2020 GPCD was calculated to be 105 GPCD, which meets the 2020 water use target. The GCSD has also demonstrated compliance with the 2020 Water Use Target by completing the SB X7-7 2020 Compliance Form, attached in Appendix E.

<b>Table 5-2 2020 Compliance from SB X7-7 2020 Compliance Form (Submittal Table 5-2)</b>				
<b>2020 GPCD</b>			<b>2020 Confirmed Target GPCD</b>	<b>Did Supplier Achieve Targeted Reduction for 2020? Y/N</b>
<b>Actual 2020 GPCD</b>	<b>2020 TOTAL Adjustments<sup>(1)</sup></b>	<b>Adjusted 2020 GPCD</b>		
117	12.18	105	107	Yes
NOTES: <sup>(1)</sup> The 2020 total adjustments include 0.27 GPCD for water used for fire suppression in 2020 and 11.91 GPCD for the amount of additional water that was used by vacation homes and rentals during the 2020 COVID-19 pandemic.				

### 5.8. Regional Alliance

As discussed in Section 2.4, the GCSD’s 2020 UWMP was not developed as part of a Regional Alliance. Information from the GCSD’s 2020 UWMP is not required to be reported in a Regional Alliance report.

## **CHAPTER 6 - SYSTEM SUPPLIES CHARACTERIZATION**

### **6.1. Introduction**

This chapter presents an analysis of the GCSD’s water supplies, as well as an estimate of water-related energy-consumption. The intent of this chapter is to present a comprehensive overview of GCSD’s water supplies, estimate the volume of available supplies over the UWMP planning horizon, and assess the sufficiency of GCSD’s supplies to meet projected demands under “normal” hydrologic conditions.

### **6.2. Purchased or Imported Water**

The GCSD’s potable water supply is exclusively surface water obtained from the Hetch Hetchy Mountain Tunnel under a 1964 Agreement with the SFPUC. The Agreement was extended in 1984 and expires on March 23, 2034. Under the terms of the Agreement, GCSD is a retail customer of the SFPUC.

### **6.3. Groundwater**

The GCSD does not currently use groundwater as part of its water supply. Groundwater in Tuolumne County is severely limited due to the hard, impermeable bedrock that covers the majority of the County and due to the high naturally occurring iron content of the groundwater.

### **6.4. Surface Water**

As previously stated, surface water is supplied to the GCSD from the Hetch Hetchy Mountain Tunnel under an Agreement with the SFPUC. Under the terms of the Agreement, Groveland Community Services District is a retail customer of the SFPUC. The agreement expires on March 23, 2034.

The supply source for Hetch Hetchy Reservoir is the Tuolumne River. The majority of this water supply originates in the upper Tuolumne River Watershed high in the Sierra Nevada Mountain Range, remote from human development and pollution. This pristine water source is protected in tunnels until it gets to the GCSD. The GCSD has been approved to use this drinking water source without requiring filtration. GCSD chlorinates, chloraminates, and treats the water with ultraviolet light disinfection. The water meets the criteria of the Long Term 2 (LT2) surface water supply regulations.

The Agreement with SFPUC allows for GCSD to serve up to 22,072 customers (4,944 acre-feet or 7,192 MG per year) by the year 2050. The projection includes a factor of 200 gallons of water per customer per day. A copy of the Agreement is provided in Appendix F. The Agreement defines a contract service area boundary of 25 square miles. GCSD’s service area is within the contract area and has not yet reached this sphere of influence boundary. Population, however, has not increased as originally anticipated in the Agreement and is not expected to grow significantly in the near future.

A Water Exchange Agreement was entered into between the SFPUC, the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) on July 23, 2007. The Agreement allows GCSD to use Pine Mountain Lake as its alternative water supply when the SFPUC shuts down the Hetch Hetchy Mountain Tunnel for durations up to 60 days per year for tunnel repair or during emergencies. The volume of water that will be allowed to be used during the shutdowns is 200 acre-feet. The Water Exchange Agreement is provided in Appendix G.

In November of 2007, GCSO purchased a Pall Aria Microfiltration (MF) Water Treatment System from the Pall Corporation. The Pall MF system enables the GCSO to filter and treat water from PML and pump it into the distribution system. PML is a separate water supply source for the GCSO. The GCSO received an interim permit to operate the Pall MF system from the California Department of Public Health on March 4, 2009. A full operational permit was issued in May of 2013, for a maximum flow rate of 600 gallons per minute (gpm) or (0.86 million gallons per day (MGD) with two membrane racks in service (Water Permit No. 03- 11-13P-008, for System No. 5510009).

#### **6.4.1. Existing Water Treatment**

According to the GCSO's 2001 Water Master Plan, water flows from Hetch Hetchy through a tunnel just south of Groveland into Priest Regulating Reservoir. GCSO draws water from the tunnel prior upstream of Priest Regulating Reservoir; these locations are the Big Creek Shaft (the most upstream) and the Second Garrotte Shaft.

The water treatment facilities at each pump shaft are similar and consist only of disinfection and pH adjustment; the latter mitigates corrosion. The water supply is unfiltered. Water from the tunnel is pumped to the surface and chlorinated using sodium hypochlorite. A static mixer provides necessary mixing of the hypochlorite and the water. The hypochlorite feed is controlled on the basis of a preset residual. The chlorinated water then enters a baffled clearwell where sufficient contact time is provided to meet the CT requirements of the Surface Water Treatment Rule (SWTR). The raw water turbidity, clearwell level and temperature are measured continuously. Water flows from the clearwell to booster pumps, which lift the water into the distribution system. Prior to entering the booster pumps, there is another opportunity to add hypochlorite. Also at this point, lime is added to adjust the pH upward to about 9.5 to 10 to mitigate corrosion. The lime feed is controlled on the basis of maintaining a preset pH. A static mixer is provided at the point of hypochlorite and lime addition. The finished water turbidity, pH and chlorine residual is monitored continuously just downstream of the distribution system booster pumps.

The water source is relatively pristine and, as a result, the GCSO has been able to avoid filtration. The SFPUC prepared an application for "filtration avoidance" in 1993. The conclusion was that the Hetch Hetchy water source met all of the eleven criteria for EPA filtration avoidance as of June 29, 1993. The SFPUC has provided routine monitoring of the watershed and has avoided the need to provide filtration ever since.

In April of 2014, the SFPUC announced that due to the ongoing Drought, an alternative raw water source would be introduced into the mountain tunnel. The new alternative source water from Cherry Lake did not meet the criteria for filtration avoidance. GCSO worked with the State Revolving Fund and the United States Department of Agriculture (USDA) to secure 85% of the funding needed to install a Pall Micro Filtration Trailer to filter the Cherry Lake water.

#### **6.5. Stormwater**

The GCSO does not have any stormwater recovery systems that provide beneficially reuse of stormwater.

## **6.6. Wastewater and Recycled Water**

### **6.6.1. Recycled Water Coordination**

*CWC Section 10633*

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:*

- (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*
- (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*
- (c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*
- (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*
- (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*
- (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*
- (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

The GCSD owns and operates the Regional Wastewater System which collects wastewater from approximately half of the water customers within the principal communities and developed areas within the GCSD and transmits it to the Regional Wastewater Treatment Plant for treatment. Treated wastewater (recycled water) from the GCSD is then delivered to the Pine Mountain Lake Association's 18-hole golf course and GCSD's 14 acres of spray fields. The GCSD's recycled water supply and the use of such recycled water are more fully described in the following sections.

### **6.6.2. Wastewater Collection, Treatment, and Disposal**

*CWC Section 10633(a)*

*A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*

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The GCSD owns and operates the wastewater system that serves the communities of Groveland, Big Oak Flat and Pine Mountain Lake. Located in southern Tuolumne County in the central Sierra Nevada Mountains, the system consists of 16 lift stations, 35 miles of wastewater collection gravity pipelines ranging in size from 6 to 12-inches and 7 miles of pressure pipelines ranging in diameter from 4 to 12 inches. GCSD also operates the Wastewater Treatment Plant (WWTP), two storage reservoirs, and approximately 14 acres of spray fields.

Due to the mountainous terrain and the concentration of residences around the low-lying Pine Mountain Lake, the vast majority of wastewater flows within the GCSD require pumping to the WWTP. The treatment plant is located near the highest elevation in the wastewater system. Some wastewater flows can flow through as many as seven lift stations before reaching the treatment plant.

The WWTP conducts primary and secondary treatment of wastewater. Wastewater arrives at the wastewater plant either by force main up from the Pine Mountain Lake system, or by gravity main down from Groveland and Big Oak Flat. The only primary treatment unit is the Roto-strainer, which removes roots, rags, plastics, and other coarse debris from the incoming wastewater. Wastewater then flows to the Equalization basin where it is aerated. The addition of air freshens the wastewater, removes gasses, adds oxygen, promotes the flotation of grease and oil, and aids in coagulation. The Equalization Basin has a volume of 570,000 gallons and has a medial berm that allows shutdown of half the basin for maintenance during low flow conditions.

Through the contact basin, wastewater is then introduced into the treatment plant where it is oxygenated and fed to a thriving population of naturally occurring organisms. These organisms feed on organic materials in the wastewater, breaking them down into gasses, liquids, or other stable solid forms. The return activated sludge pump is used to either return settled materials and microorganisms to the treatment process, or to pump them into the aerobic digestion chamber. Reduced solids are pumped into the aerobic digestion chamber where they are thickened with chemical coagulants. Thickened sludge is then pumped into conveyed drying beds. After settling, the liquid portion of the wastewater flows over weirs and into the chlorine contact basin. Chlorine is used to kill any remaining organism in the plant effluent.

Based on records from 2016 to 2020, the WWTP receives an average daily flow of approximately 0.128 MGD. Peak daily flow into the plant has been as high as 0.5 MGD (638,000 gpd). The two 390 gpm variable speed, influent pumps can pump at a continuous rate of 0.7 MGD (850,000 gpd).

Treated effluent is pumped to two storage reservoirs. Reservoir 1 has a volume of 4.5 MG and Reservoir 2 has a volume of 55 MG. Reservoir 1 serves several purposes for the WWTP. First, Reservoir 1 is used to store treated effluent from the WWTP that does not quite meet the WDR permit standards. For example, settleable solids may have been reduced by 95 percent, but fail to meet the daily maximum standard of 1.0 ml/l-hr. The treated wastewater is diverted to Reservoir 1 for a few days until the settleable solids meet the standard. The diverted wastewater is retested and either returned to the Equalization Basin or is blended with fully treated effluent in the chlorine contact basin and pumped to Reservoir 2.

During extreme wet weather flows, excess inflow is pumped from the Equalization Basin to Reservoir 1. After the storm flows have subsided, the water in Reservoir 1 is returned to the Equalization Basin for full treatment. Reservoir 1 is also used during periods when the effluent in Reservoir 2 is used to irrigate the



Pine Mountain Lake golf course or spray fields. This is done to avoid the possibility of applying chlorinated water to the grass. The water diverted to Reservoir 1 is fully treated wastewater. It is blended back into the chlorine contact basin and pumped to Reservoir 2 after the golf course irrigation cycle is complete.

Table 6-1 summarizes the information of the collection of wastewater generated within the GCSD’s service area in 2020.

<b>Table 6-1 Wastewater Collected Within Service Area in 2020 (Submittal Table 6-2)</b>						
<input type="checkbox"/>	There is no wastewater collection system. The supplier will not complete the table below.					
47%	Percentage of 2020 service area covered by wastewater collection system.					
47%	Percentage of 2020 service area population covered by wastewater collection system.					
<b>Wastewater Collection</b>			<b>Recipient of Collected Wastewater</b>			
<b>Name of Wastewater Collection Agency</b>	<b>Wastewater Volume Metered or Estimated?</b>	<b>Volume of Wastewater Collected from UWMP Service Area 2020</b>	<b>Name of Wastewater Treatment Agency Receiving Collected Wastewater</b>	<b>Treatment Plant Name</b>	<b>Is WWTP Located Within UWMP Area?</b>	<b>Is WWTP Operation Contracted to a Third Party?</b>
Groveland Community Services District	Metered	42	Groveland Community Services District	Groveland Community Services District	Yes	No
<b>Total Wastewater Collected from Service Area in 2020:</b>		<b>42</b>				

Table 6-2 identifies the wastewater treated and disposed of within the GCSD’s service area in 2020. As discussed above, the GCSD’s WTP is located within the GCSD’s water service area and provides primary and secondary treatment of wastewater. Secondary undisinfectated treated effluent from the WWTP is pumped to either the Pine Mountain Lake Association’s 18-hole golf course and GCSD’s 14 acres of spray fields for landscape irrigation.

**Table 6-2 Wastewater Treatment and Discharge Within Service Area in 2020 (Submittal Table 6-3)**

<input type="checkbox"/> No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.											
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Groveland Community Services District	PMLA Golf Course & District Spray Fields	Irrigation	5C55100001	Irrigation	No	Secondary, Undisinfected	42	4	38	0	0
<b>TOTAL</b>							<b>42</b>	<b>4</b>	<b>38</b>	<b>0</b>	<b>0</b>

### 6.6.3. Recycled Water System

*CWC Section 10633 (c)*

*A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

All of the wastewater in the GCSD is collected, treated and used for irrigation on GCSD's spray fields and the Pine Mountain Lake Association (PMLA) golf course. The 6-inch diameter recycled water pressure pipeline to the golf course is 4,200 feet long. A 75-horsepower recycled water pump is used to deliver recycled water to the PMLA. Once the water is delivered to the golf course, the recycled water enters a 3-million-gallon open reservoir operated by the Pine Mountain Lake Association. The Pine Mountain Lake Association then pumps the recycled water to the irrigation system serving the 110-acre golf course.

During the winter months the recycled water is stored in Reservoir 2 and, if necessary, Reservoir 1. The golf course and the spray field irrigation demand account for 100 percent of the recycled water used. When recycled water volume is depleted in the late summer months, typically September or October, the golf course then uses Pine Mountain Lake raw water as their irrigation source.

The GCSD treats wastewater to secondary standards and is permitted to pump treated wastewater to the Pine Mountain Lake Association's maintenance yard pond, where it is blended with raw water from Pine Mountain Lake. This blended water is then used to irrigate the Pine Mountain Lake Golf Course. Additionally, GCSD is permitted to dispose of treated effluent on 14 acres of irrigation fields located on District property.

All recycled water use is metered. Flow rates and totals for each meter are recorded. Isolation valves are used to direct where the water will be delivered.

### 6.6.4. Potential, Current, and Projected Recycled Water Uses

*CWC Section 10633*

*(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

*(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

*(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

Essentially, all of the recycled water produced by GCSD every year is utilized. Some of the recycled water does evaporate in the open storage reservoirs. As mentioned previously, the Pine Mountain Lake Golf Course consumes most of the recycled water (26 MG), with the second largest consumer being GCSD's spray fields (12 MG). No potable water produced at GCSD's WTP is utilized for irrigation of the golf course.

According to the agreement between the PMLA and the GCSD, the PMLA golf course could use up to 65 MG of recycled water per year. In addition, a recycled water connection has been installed at GCSD for

GCSO tanker trucks to fill up for dust control and construction uses on GCSO’s property. In 2008, a connection was also put in so that Cal-Fire could use recycled water for firefighting purposes. Use of recycled water will ultimately help augment potable water supplies and postpone the increased water supply demand.

Table 6-3 displays the current recycled water uses within GCSO’s service area.

<b>Table 6-3 Recycled Water Direct Beneficial Uses Within Service Area (Submittal Table 6-4)</b>										
<input type="checkbox"/>		Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.								
Name of Supplier Producing (Treating) the Recycled Water:		Groveland Community Services District								
Name of Supplier Operating the Recycled Water Distribution System:		Groveland Community Services District								
Supplemental Water Added in 2020 (volume)										
Source of 2020 Supplemental Water										
Beneficial Use Type	Potential Beneficial Uses of Recycled Water	Amount of Potential Uses of Recycled Water	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Agricultural irrigation										
Landscape irrigation (exc golf courses)	Landscape Irrigation	12	Irrigation or 14-acre spray fields	Secondary, Undisinfected	12	12	12	12	12	12
Golf course irrigation	Landscape Irrigation	26	Irrigation of 110-acre golf course	Secondary, Undisinfected	26	26	26	26	26	26
Commercial use										
Industrial use										
Geothermal and other energy production										
Seawater intrusion barrier										
Recreational impoundment										
Wetlands or wildlife habitat										

<b>Table 6-3 Recycled Water Direct Beneficial Uses Within Service Area (Submittal Table 6-4)</b>										
<input type="checkbox"/>		Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.								
Name of Supplier Producing (Treating) the Recycled Water:		Groveland Community Services District								
Name of Supplier Operating the Recycled Water Distribution System:		Groveland Community Services District								
Supplemental Water Added in 2020 (volume)										
Source of 2020 Supplemental Water										
Beneficial Use Type	Potential Beneficial Uses of Recycled Water	Amount of Potential Uses of Recycled Water	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Groundwater recharge (IPR)										
Reservoir water augmentation										
Direct potable reuse										
Other (Description Required)										
<b>TOTAL</b>					<b>38</b>	<b>38</b>	<b>38</b>	<b>38</b>	<b>38</b>	<b>38</b>

According to the 2015 UWMP, GCSD estimated applying 19 MG of treated effluent to GCSD’s spray fields and 23 MG to the PMLA golf course. In 2020, the GCSD applied a total of 38 MG for landscape irrigation and golf course irrigation. Table 6-4 displays the 2015 UWMP projection for recycled water versus the 2020 actual use.

<b>Table 6-4 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (Submittal Table 6-5)</b>		
<input type="checkbox"/>		Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.
Beneficial Use Type	2015 Projection for 2020	2020 Actual Use
Agricultural irrigation		
Landscape irrigation (exc golf courses)	19	12
Golf course irrigation	23	26
Commercial use		
Industrial use		
Geothermal and other energy production		

<b>Table 6-4 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (Submittal Table 6-5)</b>		
<input type="checkbox"/>	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.	
Beneficial Use Type	2015 Projection for 2020	2020 Actual Use
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required)		
<b>TOTAL</b>	<b>42</b>	<b>38</b>

**6.6.5. Actions to Encourage and Optimize Future Recycled Water Use**

*CWC Section 10633*

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier... and shall include the following:*

*(g) A plan for optimizing the use of recycled water in the supplier’s service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

GCSO will assist commercial customers in designing recycling projects conducive to District operations. As part of the educational efforts of the GCSO, recycling and conservation issues are included in school and public education forums. At this time, the GCSO currently does not have any plans to expand recycle water use in the near future.

<b>Table 6-5 Methods to Expand Future Recycled Water Use (Submittal Table 6-6)</b>			
<input checked="" type="checkbox"/>	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
<b>TOTAL</b>			<b>0</b>

Given the current usage of treated wastewater for irrigation purposes, there is no hydrological benefits to increasing such recycling use. The GCSO will expand the reclamation areas as needed to be able to dispose of 100 percent of the treated effluent. GCSO will encourage commercial customers to implement recycled water use programs within their sites.

## 6.7. Desalinated Water Opportunities

*CWC Section 10631(g)*

*Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.*

The UWMPA requires water agencies to consider options for desalination. The GCSD is located a considerable distance from the Pacific Ocean, so constructing a transmission main to move either sea water or desalinated water directly to the GCSD is not feasible and cost prohibitive.

In order to acquire additional water supplies, the GCSD may enter into an agreement with SFPUC or a SWP contractor situated in close proximity to the ocean. Under such an arrangement, the GCSD could use funds collected from the developer fee to contribute financially to the construction of a desalination facility, and in turn, the partnering agency would trade the portion of desalinated water produced with the GCSD funding for local use in the San Francisco seaside area for an equal portion of fresh water from Hetch Hetchy tunnel being made locally available to the GCSD and its customers.

## 6.8. Water Exchanges or Transfers

*CWC Section 10631(c)*

*Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

A Water Exchange Agreement was entered into between the SFPUC, MID and TID on July 23, 2007. The Agreement allows GCSD to use Pine Mountain Lake as their alternative water supply when the SFPUC shuts down the Hetch Hetchy Mountain Tunnel for durations up to 60 days per year for planned tunnel repair. This alternative water supply can also be used in the event of an unplanned outage of the Mountain Tunnel or during an emergency within the GCSD water treatment system. The Water Exchange Agreement is provided in Appendix G.

## 6.9. Future Water Projects

*CWC Section 10631 (f)*

*Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

The GCSD currently relies solely on surface water for its water supply. The GCSD's 2001 Water Master Plan evaluates the feasibility of groundwater use, and due to the impermeable bedrock, groundwater has long been considered unreliable in the area. The high initial capital costs to add groundwater water make the project unfeasible at this time. The GCSD intends to meet its projected water demands through the continued use of surface water alone.

Most facilities in the system are approaching 30-years old and are experiencing more frequent failures, manifesting themselves as sewage spills and discharge permit violations. The existing system was not designed to live far into the 21st Century and the GCSD is faced with embarking on a major capital program designed to satisfy the community’s needs and meet regulatory requirements. Currently, GCSD is planning for the construction of miscellaneous water distribution system upgrades to provide better and more reliable water service in downtown Groveland and Big Oak Flat. Once constructed, the upgraded system will provide adequate fire flow throughout GCSD’s service area. A new distribution system would experience less water main breaks and less water losses. This will result in an immediate reduction in water purchases by GCSD as well as a significant reduction in operation and maintenance costs.

**Table 6-6 Expected Future Water Supply Projects or Programs (Submittal Table 6-7)**

<input type="checkbox"/>	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.				
<input type="checkbox"/>	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.				
	Provide page location of narrative in the UWMP				
Name of Future Projects or Programs	Joint Project with other suppliers?		Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Y/N	If Yes, Supplier Name			
Water Distribution System Improvements	No		Not Available	Average Year	Not Available

## 6.10. Summary of Existing and Planned Sources

*CWC Code 10631*

*(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following...*

*(b)(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.*

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier’s plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

Water pumped from the Hetch Hetchy Mountain tunnel has historically been the only source of potable water supply. Most of the water distribution system was constructed during the 1970’s with the Pine Mountain Lake development. The GCSD’s municipal water system consist of 2 water supply pumps, a



treatment facility with clearwell storage, 5 water tanks, 11 pressure zones, 17 pressure reducing valves (PRVs), 3 intra-system booster pumps, 9 pressure relief valves, and approximately 70 miles of water mains. The challenge presented by this system is balancing the various supply sources (tanks, PRVs) to each zone and minimizing the pumping required to serve each meter within GCSD.

According to their Water Master Plan, the GCSD will need to improve the existing distribution system in order to meet design standards. The GCSD is planning to construct miscellaneous upgrades on the existing distribution system. This improvement will provide a better and more reliable water service to the downtown Groveland area and Big Oak Flat.

Once constructed, the upgrade distribution system will provide adequate fire flow throughout the GCSD’s service area, and the system will experience less water main breaks and less water losses. As a result, the GCSD will be able to reduce the amount of water purchases and reduce system operation and maintenance cost. The GCSD’s annual treated water supply for 2020 is summarized in Table 6-7 below.

<b>Table 6-7 Water Supplies (Submittal Table 6-8)</b>				
<b>Water Supply</b>	<b>Additional Detail on Water Supply</b>	<b>2020</b>		
		<b>Actual Volume</b>	<b>Water Quality</b>	<b>Total Right or Safe Yield</b>
Surface water (not desalinated)	Purchased Surface Water from SFPUC	130	Drinking Water	130
<b>Total</b>		<b>130</b>	-	<b>130</b>

Table 6-8 summarizes the future project water supplies for the GCSD. As previously described, the GCSD will continue to utilize surface water purchased from the SFPUC as their sole water source.

<b>Table 6-8 Water Supplies — Projected (Submittal Table 6-9)</b>											
Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Surface water (not desalinated)	Purchased Surface Water from SFPUC	142	142	146	146	151	151	159	159	170	170
<b>Total</b>		<b>142</b>	<b>142</b>	<b>146</b>	<b>146</b>	<b>151</b>	<b>151</b>	<b>159</b>	<b>159</b>	<b>170</b>	<b>170</b>

## 6.11. Climate Change Impacts to Water Supply

The climatic conditions of Central California demand careful water management practices due to the wide range of rainfall and rainy seasons and the high temperatures that frequently occur in the summer months. The northern parts of the Central Valley receive substantially greater precipitation from winter storms which sweep down from the Pacific Northwest, while the southernmost regions are more desert like due to lack of precipitation. The average annual precipitation for the Groveland area is 37 inches. The rainy season runs from October through May, but 90 percent of the rainfall occurs between the beginning of November and the end of April. Drought conditions are not uncommon and can last for multiple years. During summer months, water consumption varies directly with daily temperature maximums and the Groveland region experiences temperatures in the high 80's during the summer months.

During drought periods, declines in surface water flows can be detrimental to an areas water supply. However, the SFPUC has planned to assure a reliable water supply during drought years through the implementation of the Water System Improvement Plan to meet the demands of their customers. Since the GCSD is located on the upper part of Hetch Hetchy Aqueduct system, little or no improvement is needed to supply the GCSD under drought conditions. That, coupled with the fact that GCSD uses only 0.4 MGD average compared to the 265 MGD that the SFPUC delivers, makes it an insignificant impact to water supply.

Because GCSD has a contract service area agreement with SFPUC until 2034 and GCSD is located on the uppermost portion of their transmission system, GCSD and SFPUC estimate that enough water will be available from the Hetch Hetchy system to meet projected demands over the next twenty years, assuming a projected growth rate of 1.0 percent per year, which is larger than the average annual growth rate demonstrated over the last 30 years. The SFPUC plans water deliveries anticipating that an unprecedented drought may occur.

## 6.12. Energy Use

*CWC Section 10631.2. (a)*

*In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:*

- (1) An estimate of the amount of energy used to extract or divert water supplies.*
- (2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.*
- (3) An estimate of the amount of energy used to treat water supplies.*
- (4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.*
- (5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.*
- (6) An estimate of the amount of energy used to place water into or withdraw from storage.*
- (7) Any other energy-related information the urban water supplier deems appropriate.*

For this 2020 UWMP, suppliers are required to include information that could be used to calculate the energy intensity of their water service, as listed in Water Code Section 10631.2(a). Energy intensity is defined as the amount of energy used to collectively divert, store, convey, treat, and distribute each unit volume of water. For the GCS D, this means the energy required to pump water from the two vertical shafts that are tapped into the Mountain Tunnel (Big Creek Station and Second Garrotte Station), treat the surface water, pump water into the five storage reservoirs, and pump water from the storage reservoirs and into the distribution system. These processes are metered for electricity use in kilowatt-hours (kWh).

In accordance with the CWC Section 10631.2(a), an energy intensity analysis was performed for the reporting period of January 1, 2020, through December 31, 2020. The energy intensity analysis for the water system is shown below in Table 6-9. The final calculated energy intensity for the water system is 7,259.3 kilowatt-hours per million gallons (kWh/MG). The GCS D does not generate any electricity to offset their electricity use.

<b>Table 6-9 Recommended Energy Reporting - Total Utility Approach (DWR Table O-1B:)</b>				
Enter Start Date for Reporting Period	1/1/2020	Urban Water Supplier Operational Control		
End Date	12/30/2020			
<input type="checkbox"/> Is upstream embedded in the values reported?	Sum of All Water Management Processes		Non-Consequential Hydropower	
	Total Utility	Hydropower	Net Utility	
Volume of Water Entering Process (MG)	130	0	130	
Energy Consumed (kWh)	940,378	0	940,378	
<b>Energy Intensity (kWh/MG)</b>	<b>7,259</b>	<b>0</b>	<b>7,259</b>	

As discussed in Section 6.6, the GCS D collects, treats, and discharges wastewater from approximately half of the water customers within the principal communities and developed areas within the GCS D. The energy intensity associated with the GCS D's wastewater systems for the reporting period of January 1, 2020, through December 31, 2020, is provided in Table 6-10. The final calculated energy intensity for the wastewater system is 18,967 kWh/MG. The GCS D's energy intensity tables and associated narratives are provided in Appendix H.

<b>Table 6-10 Recommended Energy Reporting - Wastewater &amp; Recycled Water (DWR Table O-2:)</b>				
Enter Start Date for Reporting Period	1/1/2020	Urban Water Supplier Operational Control		
End Date	12/30/2020			
<input type="checkbox"/> Is upstream embedded in the values reported?	Water Management Process			
	Collection/Conveyance	Treatment	Discharge/Distribution	Total
Volume of Wastewater Entering Process (MG)	0	42	0	42
Wastewater Energy Consumed (kWh)	211,824	584,640	0	796,464
<b>Wastewater Energy Intensity (kWh/MG)</b>	<b>0</b>	<b>13,922</b>	<b>0</b>	<b>18,967</b>

**Table 6-10 Recommended Energy Reporting - Wastewater & Recycled Water (DWR Table O-2:)**

Enter Start Date for Reporting Period		Urban Water Supplier Operational Control			
	1/1/2020				
End Date		Water Management Process			
<input type="checkbox"/> Is upstream embedded in the values reported?		Collection/Conveyance	Treatment	Discharge/Distribution	Total
Volume of Recycled Water Entering Process (MG)		0	0	0	0
Recycled Water Energy Consumed (kWh)		0	0	0	0
<b>Recycled Water Energy Intensity (kWh/MG)</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## **CHAPTER 7 - WATER SUPPLY RELIABILITY AND DROUGHT RISK ASSESSMENT**

### **7.1. Introduction**

Assessing water service reliability is the fundamental purpose for an urban water supplier to prepare and update their UWMP. Water service reliability reflects the supplier’s ability to meet the water needs of its customers with water supplies under varying conditions. This 2020 UWMP considers the reliability of meeting customer water use by analyzing plausible hydrological variability, regulatory variability, climate conditions, and other factors that could affect the GCSD’s water supply and its customers’ water uses. The UWMPA also requires that a supplier’s UWMP include information on the quality of water supplies and how this affects management strategies and supply reliability. In addition, this chapter includes a new requirement for a Drought Risk Assessment (DRA) that enables the GCSD to evaluate risk under a severe drought period lasting for the next five consecutive years.

### **7.2. Water Service Reliability Assessment**

*CWC Section 10635(a)*

*Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

The water service reliability assessment presented in the following sections summarizes the GCSD’s expected water service reliability for a normal year, single dry year, and five consecutive dry year projections for 2025, 2030, 2035, and at least through 2040.

#### **7.2.1. Constraints on Water Sources**

*Section 10631 (b)(1)*

*A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.*

There are a variety of factors that can impact water supply reliability. These factors include water quality, legal constraints, and climatic issues. A brief discussion on each of these factors is provided below.

##### **7.2.1.1. Water Quality**

GCSD has experienced periodic short-term outages as a result of water quality events. Due to the fact that Hetch Hetchy water is not filtered, it is subject to strict water quality standards set by the DWR. Due to occasional weather events, turbidity levels of the raw water supply sometimes exceed standards. During

those events, GCSD uses its 6.7 million gallons of local reservoir storage to meet the demands of the customers. That is enough local storage to meet approximately 17 days of average annual demand.

#### **7.2.1.2. Climatic Changes**

The climatic conditions of Central California demand careful water management practices due to the wide range of rainfall and rainy seasons and the high temperatures that frequently occur in the summer months. The northern parts of the Central Valley receive substantially greater precipitation from winter storms which sweep down from the Pacific Northwest, while the southernmost regions are more desert like due to lack of precipitation. The average annual precipitation for the Groveland area is approximately 37 inches. The rainy season runs from October through May, but 90 percent of the rainfall occurs between the beginning of November and the end of April. Drought conditions are not uncommon and can last for multiple years. Summer water consumption varies directly with daily temperature maximums and the Groveland region experiences temperatures in the high 90's during the summer months.

Drought periods reduce the availability of surface water, but the SFPUC has planned to assure a reliable water supply during drought years through the implementation of the Water System Improvement Plan to meet the demands of their customers. Since the GCSD is located on the upper part of Hetch Hetchy Aqueduct system, little or no improvement is needed to supply the GCSD under drought conditions. That, coupled with the fact that the GCSD uses only 0.4 MDG average compared to the 265 MDG that the SFPUC delivers, makes it an insignificant impact to water supply.

#### **7.2.1.3. Legal Constraints**

Legal factors, such as surface water contracts, can affect the reliability of a water distribution system or water supply. The GCSD currently has a contract service area agreement with the SFPUC, under which the SFPUC agrees to supply water to the GCSD at the Second Garrotte and Big Creek shafts until 2034. The SFPUC delivers 265 million gallons per day, of which, the GCSD uses only 0.4 million gallons per day average. The SFPUC has supplied a reliable water source to GCSD since 1965 and will continue to do so until 2034. Due to the current agreement in place, it is highly unlikely that the GCSD will experience any legal implications that could affect the reliability of the GCSD's water supply.

#### **7.2.2. Year Type Characterization**

Water supply reliability is assessed based on the characteristics of the GCSD's water supplies during various water year types which are provided in this section. CWC Section 10635(a) requires that the GCSD's water service reliability be assessed based on the following three water year types:

- Normal Year – This condition represents the water supplies the GCSD considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available to the Supplier. To determine the amount of water available during a normal year, the GCSD evaluated the average volume of water that was supplied over the years of 1995 to 2020. During this period, the average volume of water supplied was approximately 150 MG. For this 2020 UWMP, 150 MG will be used as the volume of water available under normal conditions.

- Single Dry Year – The single dry year is recommended to be the year that represents the lowest water supply available. The year 2019 represents the single dry year for the GCSD, during which, the GCSD supplied 118 MG of water.
- Five-Consecutive Year Drought – The driest five-year historical sequence for the supplier, which may be the lowest average water supply available for five years in a row. For the five-year drought period, the GCSD evaluated the average volume of water that was supplied during the State’s most recent drought period, which occurred during the years of 2012 to 2016. During this period, the average volume of water that was supplied was approximately 136 MG. Between 2012 and 2016, the volume of water supplied decreased at an average annual rate of approximately 4.2 percent.

Table 7-1 summarizes the GCSD’s historical supply reliability during the water years described above. The available supplies columns specify the volume and percentage of the GCSD’s total water supply expected if the hydrology from that type of year were to repeat. However, Based on the available quantity of surface water and the SFPUC’s Water System Improvement Plan that assure a reliable water supply, it is not anticipated that a single or multiple dry year period will significantly reduce the availability of water supply to the GCSD.

<b>Table 7-1 Basis of Water Year Data (Reliability Assessment) (Submittal Table 7-1)</b>			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		<input type="checkbox"/>	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		<input checked="" type="checkbox"/>	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available (MG)	% of Average Supply
Average Year	1995-2020	150	100%
Single-Dry Year	2019	119	80%
Consecutive Dry Years 1st Year	2012-2016	136	90%
Consecutive Dry Years 2nd Year <sup>(1)</sup>	2012-2016	130	87%
Consecutive Dry Years 3rd Year <sup>(1)</sup>	2012-2016	124	83%
Consecutive Dry Years 4th Year <sup>(1)</sup>	2012-2016	119	79%
Consecutive Dry Years 5th Year <sup>(1)</sup>	2012-2016	114	76%
NOTES:			
<sup>(1)</sup> Assumes a 4.2 percent decrease in the available water supply from previous year.			

### 7.2.3. Supply and Demand Comparison

*CWC Section 10635(a)*

*Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years.*



*This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

The following sections compare GCSD’s projected water demands, as presented in Chapter 4 of this 2020 UWMP, with the projected water supplies available during normal, single, and multiple dry years to assess the reliability of GCSD’s water supply. Under the various water year types, the total water supply that is available on an annual basis is compared to the total annual projected water use for the GCSD service area from 2025 to 2045 in five-year increments.

### 7.2.3.1. Normal Year

Table 7-2 displays the projected supply and demand totals for a normal year. The supply and demands totals are consistent with those in Table 6-8 and Table 4-6, respectively. The GCSD is expected to have adequate water supplies during normal years to meet its projected demands through 2045.

<b>Table 7-2 Normal Year Supply and Demand Comparison (Submittal Table 7-2)</b>					
	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045</b>
Supply Totals (From Table 6-8)	142	146	151	159	170
Demand Totals (From Table 4-5)	142	146	151	159	170
Difference	0	0	0	0	0

### 7.2.3.2. Single Dry Year

Single-dry year effects are simulated through a methodology which assumes that the supply and demand totals will decrease by approximately 20 percent below normal year demands as a consequence of mandatory water use restrictions. As previously stated, the SFPUC delivers approximately 265 MGD, (of which GCSD’s portion is 0.4 MGD) all of which can be met through existing resources. Also, the SFPUC plans its water deliveries anticipating that a drought worse than the 1987 through 1992 drought may occur. As shown in Table 7-3, it is not anticipated that a single dry year period will reduce the availability of water supply to GCSD.

<b>Table 7-3 Single Dry Year Supply and Demand Comparison (Submittal Table 7-3)</b>					
	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045</b>
Supply Totals	113	116	120	127	135
Demand Totals	113	116	120	127	135
Difference	0	0	0	0	0

### 7.2.3.3. Five Consecutive Dry Years

Table 7-4 shows the projected supply and demands totals for multiple dry year period extending five consecutive years over the planning period. The GCSD assumes that the supply and demand totals will decrease below normal year demands by approximately 10 percent in the first year, 13 percent in the second year, 17 percent in the third year, 21 percent in the fourth year, and 24 percent in the fifth year.

<b>Table 7-4 Multiple Dry Years Supply and Demand Comparison (Submittal Table 7-4)</b>						
		<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045</b>
First year	Supply totals	128	132	137	144	154
	Demand totals	128	132	137	144	154
	Difference	0	0	0	0	0
Second year	Supply totals	123	126	131	138	147
	Demand totals	123	126	131	138	147
	Difference	0	0	0	0	0
Third year	Supply totals	118	121	125	132	141
	Demand totals	118	121	125	132	141
	Difference	0	0	0	0	0
Fourth year	Supply totals	113	116	120	126	135
	Demand totals	113	116	120	126	135
	Difference	0	0	0	0	0
Fifth year	Supply totals	108	111	115	121	129
	Demand totals	108	111	115	121	129
	Difference	0	0	0	0	0

As shown in Tables 7-2, 7-3, and 7-4, anticipated supplies surface water is sufficient to meet all demands through year 2045 even under drought conditions. To continue to utilize surface water, it is essential that GCSD continue its current efforts towards conservation.

#### **7.2.4. Description of Management Tools and Options**

*CWC Section 10620(f)*

*An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.*

The GCSD recognizes the importance of maintaining a high quality, reliable water supply. Although water is a renewable resource, there is a limit on the amount of water that can be sustainably drawn from a given supply source. But because of GCSD’s location and the lack of other available supply sources, the use of surface water as a primary water supply source is expected to continue through 2045.

Through the implementation of the Water System Improvement Plan, the SEFUC has guaranteed GCSD a reliable water supply, that will meet demand even during periods of drought. Due to the GCSD’s proximity to the Hetch Hetchy Aqueduct system, little or no improvements is needed to supply the GCSD under drought conditions. Because the GCSD has a contract service area agreement with the SFPUC until 2034 and GCSD is located on the uppermost portion of their transmission system, the GCSD and the SFPUC estimate that sufficient quantities of water will be available from the Hetch Hetchy system to meet projected demands over the next twenty years

### **7.3. Drought Risk Assessment**

*CWC Section 10635(b)*

*Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:*

- (1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.*
- (2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.*
- (3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.*
- (4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

New to the 2020 UWMP, CWC 10635 (b) now requires a Drought Risk Assessment (DRA). The DRA provides a quick snapshot of the anticipated supply surplus or deficit should a five-consecutive year drought occur in the next five years. The DRA can be modified or updated outside of the UWMP five-year plan cycle, so a description of the data, methodology, and basis for shortage conditions must be included in this 2020 UWMP. The DRA evaluates each water supply's reliability and compares available water supplies and projected demands during a five consecutive dry years scenario. This short-term analysis can help water suppliers foresee undesired risks, such as upcoming shortages, and provide time to evaluate and implement the necessary response actions needed to mitigate shortages in a less impactful manner to the community and environment. If demands cannot be met by the expected available supply, shortage response actions from the GCSD's Water Shortage Contingency Plan may be implemented. Details on the GCSD's WSCP are provided in Chapter 8 of this 2020 UWMP.

The following assumptions were considered during the preparation of the GCSD's DRA for the next five consecutive years:

- The five consecutive year drought period associated with this 2020 UWMP is based on five consecutive dry years from 2012 to 2016, which represents the most recent and historical five consecutive year drought. During this period, the average volume of water that was supplied was approximately 136 MG. Between 2012 and 2016, the volume of water supplied decreased at an average annual rate of approximately 4.2 percent.
- It has been assumed that the projected water supplies available during this five consecutive year period will decrease below normal year demands by approximately 10 percent in the first year, 13 percent in the second year, 17 percent in the third year, 21 percent in the fourth year, and 24 percent in the fifth year.

- The projected demands during this five consecutive year drought are based on the unconstrained projected water demands presented in Table 4-7, which is included in Section 4.3.7 of this 2020 UWMP.
- The projected demands were compared to the projected supplies to identify potential water supply deficits which will require implementation of the GCSD’s Water Shortage Contingency Plan (WSCP). To adequately meet water demands during this five consecutive drought year period, the GCSD will need to implement Stage 1 of the WSCP during the first and second years. During the third and fourth years, Stage 2 of the WSCP will need to be implemented. Stage 3 of the WSCP will need to be implemented in the final fifth year of the drought period. Conservation measures associated with each Stage are further discussed in Chapter 8 of this 2020 UWMP.

As shown in Table 7-5, during a five-year drought beginning in 2021, the GCSD can adequately meet projected demands through 2025 with the implementation of water conservation measures.

<b>Table 7-5 Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b) (Submittal Table 7-5)</b>	
<b>2021</b>	<b>Total</b>
Total Water Use	132
Total Supplies	128
Surplus/Shortfall w/o WSCP Action	(3)
<b>Planned WSCP Actions (use reduction and supply augmentation)</b>	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	2%
<b>2022</b>	<b>Total</b>
Total Water Use	133
Total Supplies	123
Surplus/Shortfall w/o WSCP Action	(10)
<b>Planned WSCP Actions (use reduction and supply augmentation)</b>	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	10
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	8%
<b>2023</b>	<b>Total</b>
Total Water Use	134
Total Supplies	118
Surplus/Shortfall w/o WSCP Action	(16)
<b>Planned WSCP Actions (use reduction and supply augmentation)</b>	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	16
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	12%

**Table 7-5 Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)  
 (Submittal Table 7-5)**

<b>2024</b>		<b>Total</b>
	Total Water Use	136
	Total Supplies	113
	Surplus/Shortfall w/o WSCP Action	(23)
<b>Planned WSCP Actions</b> (use reduction and supply augmentation)		
	WSCP - supply augmentation benefit	
	WSCP - use reduction savings benefit	23
	Revised Surplus/(shortfall)	0
	Resulting % Use Reduction from WSCP action	17%
<b>2025</b>		<b>Total</b>
	Total Water Use	138
	Total Supplies	108
	Surplus/Shortfall w/o WSCP Action	(30)
<b>Planned WSCP Actions</b> (use reduction and supply augmentation)		
	WSCP - supply augmentation benefit	
	WSCP - use reduction savings benefit	30
	Revised Surplus/(shortfall)	0
	Resulting % Use Reduction from WSCP action	22%

## CHAPTER 8 - WATER SHORTAGE CONTINGENCY PLAN

### 8.1. Introduction

*CWC Section 10632.3*

*It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.*

This chapter describes the Water Shortage Contingency Plan (WSCP) developed for the GCSO as required by Section 10632.3 of the CWC. Water shortage contingency planning is a strategic planning process to prepare for and respond to water shortages. The WSCP includes the stages of response to a water shortage, such as a drought, that occur over a period of time, as well as catastrophic supply interruptions which occur suddenly. The primary objective of the WSCP is to ensure that the GCSO has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. This locally developed plan will be the first point of reference and implementation during (1) an Agency declared water shortage, (2) a City or County proclamation of a local water supply emergency, or (3) a declared statewide drought emergency.

In response to the severe drought of 2012 to 2016, new legislation in 2018 created a WSCP mandate replacing the water shortage contingency analysis under former law. While overlapping aspects of the prior law, the new requirements have several prescriptive elements an urban water supplier's WSCP must now include, such as:

- Key attributes of its Water Supply Reliability Analysis conducted pursuant to Water Code Section 10635.
- Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage.
- Locally appropriate "shortage response actions" for each shortage level, with a corresponding estimate of the extent the action will address the gap between supplies and demands.
- Procedures for conducting an annual water supply and demand assessment with prescribed elements.
- Under Water Code Section 10632.1, urban water Suppliers are required to submit, by July 1 of each year, beginning in the year following adoption of the 2020 UWMP, an annual water shortage assessment report to the California Department of Water Resources (DWR).
- Communication protocols and procedures to inform customers, the public, and government entities of any current or predicted water shortages and associated response actions.
- Monitoring and reporting procedures to assure appropriate data is collected to monitor customer compliance and to respond to any state reporting requirements.
- A reevaluation and improvement process to assess the functionality of its WSCP and to make appropriate adjustments as may be warranted.

As part of the 2020 UWMP update, CWC Section 10632 requires urban water suppliers to prepare and adopt a WSCP that consist of the following elements:

- 8.1 Water Supply Reliability Analysis
- 8.2 Annual Water Supply and Demand Assessment Procedures
- 8.3 Six Standard Water Shortage Stages
- 8.4 Shortage Response Actions
- 8.5 Communication Protocols
- 8.6 Compliance and Enforcement
- 8.7 Legal Authorities
- 8.8 Financial Consequences of WSCP Activation
- 8.9 Monitoring and Reporting
- 8.10 WSCP Refinement Procedures
- 8.11 Special Water Feature Distinction
- 8.12 Plan Adoption, Submittal, and Availability

## **8.2. Water Supply Reliability Analysis**

*CWC Section 10632(a)(1)*

*The analysis of water supply reliability conducted pursuant to Section 10635.*

On March 8, 2010, the GCSD Board of Directors adopted Ordinance 2-10 “Water” (Ordinance 2-10), which established the rules and regulations regarding the provision of water service within the boundaries of the GCSD’s service area. As of March 13, 2017, the GCSD Board of Directors adopted Ordinance No. 2-17 to replace Ordinance 2-10 in full. The Ordinance serves to modify and expand upon the rules and regulation of the water system, including water conservation regulations and water shortage contingency measures. Article XVII, “Drought Restriction,” sets forth water shortage emergency conditions that exist with the GCSD’s boundary as declared by resolution of the Board of Directors. A copy of the full Ordinance No. 2-17 is provided in Appendix I. The GCSD updated Article XVII in order to meet the new requirements DWR has established for this 2020 UWMP.

Article XVII outlines the phases of a water shortage emergency that are established upon the declaration of the Board of Directors that an emergency condition exists. The intent of Article XVII is to implement water conservation measures and progressive restrictions on water use in order to provide certainty to water customers and enable the GCSD to control water use, provide water supplies, and plan and implement water management measures in a fair and orderly manner for the benefit of the community.

Article XVII describes measures to be implemented during times of a water shortage emergency or upon the Board of Directors declaration that an emergency condition exists. As required by DWR, it establishes six phases (as referred to as stages) of specific water conservation actions and use restrictions designed to reduce water use. Implementation of each phase is cumulative; meaning that implementation of a

higher phase shall also include implementation of all previous phases. Shortage conditions for each phase are based on a percent reduction of water supply.

As previously states, the GCSD's sole water sources is supplied from the pristine Tuolumne River Watershed, which provides a high-quality surface water supply. Drought conditions can result in declines in surface water flows which can be detrimental to an areas water supply. However, the SFPUC plans water deliveries under the premise that a drought more severe than the worst drought on record may occur. Based on the supply and demand assessment conducted in Chapter 7 of this UWMP, the GCSD believes that its water supply source will continue to adequately meet the current and the foreseeable demand through 2045.

### **8.3. Annual Water Supply and Demand Assessment Procedures**

*CWC Section 10632(a)(2)*

*The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:*

*(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.*

*(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:*

*(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.*

*(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.*

*(iii) Existing infrastructure capabilities and plausible constraints.*

*(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.*

*(v) A description and quantification of each source of water supply.*

*CWC Section 10632.1.*

*An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.*

If the surface water supply provided by the SFPUC continues to meet the water demand of the GCSD's customers without supply shortages, there is no further action required. However, if in any given year, the typical customer demand appears to be great than available supply, the GCSD Board of Directors may enact any phase of the water shortage emergency as set forth in Article XVII of the Water Ordinance No.



2-17, by adopting a resolution in response to local or regional water supply conditions. Several data sources will be consulted, including but not limited to internal and external hydrologic data, as well as all customer consumption records. A water shortage emergency may be declared based on a number of conditions, including:

- An actual or potential local water supply restriction or emergency affecting the GCSD water system.
- A formal water supply shortage notification by the Governor.

A water conservation phase will normally be implemented in a progressive manner; however, it may be necessary for the GCSD to skip states in the use reduction plan in response to catastrophic supply reductions. In general, conservation/use reduction levels will be set according to the anticipated reduction in available water supplies. The GCSD may use one or more of the following measures to determine actual reductions in water consumption:

- Establish an average water use baseline.
- Review customer meter records on a more frequent basis.
- Perform leak detections and repair on more frequent basis.
- Perform meter checking and repair on more frequent basis.
- Perform periodic water system audit.

### **8.3.1. Decision Making Process**

In accordance with CWC 10632 the GCSD will conduct an annual water supply and demand assessment, or annual assessment by July 1st of each year. The Annual Assessment team will consist of the General Manger, District Engineer, and Water Operations Manager. This team will draft and prepare a written report that discusses the results of the Annual Water Supply and Demand Assessment (Annual Assessment). This Annual Assessment will be presented to the Board of Directions annually during a regular Board of Directors meeting that is held during the May each year. This report will outline comprehensive hydrologic conditions for the historical period of record, as well as the current water year conditions based on the last snow surveys conducted by DWR staff. Consumption use will also be summarized in of this Annual Assessment for the Board of Directors to be fully informed as to whether any specific shortage response actions are necessary.

### **8.3.2. Data and Methodologies**

The GCSD will enact water shortage response actions if the available water supply is less than the estimated demands. To determine the available water supply and demand, the following information will be evaluated in the Annual Assessment:

- Hydrologic conditions for the historical period of record and current year.
- Hydrologic data for the Hetch-Hetchy Reservoir.
- Annual volume of water purchased from the SFPUC.
- Annual customer water demand, by customer use type.
- Previous water year and to date water year supply availability.
- Condition of the conveyance, treatment, and distribution systems.
- Any other locally applicable factors.

The GCSD will begin to collect and evaluate the water supply availability in January of each year and will submit the Annual Assessment report to the DWR by July 1<sup>st</sup> of each year.

#### **8.4. Six Standard Water Shortage Stages**

*CWC Section 10632(a)(3)*

*(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.*

*(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.*

In accordance with CWC Section 10632(a)(3) and the 2020 UWMP Guidebook, all urban water supplier's WSCP must include at least six standard water shortage stages and cover a possible reduction in supply of more than 50 percent. The purpose of this new requirement of the CWC is to provide a consistent regional and statewide approach to measure water supply shortage conditions in the state.

The 2020 WSCP presented in this Chapter updates the GCSD's previous 2015 WSCP and Article XVII of Ordinance No. 2-17, which included only 4 stages of voluntary and mandatory water conservation measures. For the 2020 WSCP, each of the six water shortage stages represent an increasing gap between the GCSD's estimated water supplies and the unconstrained demand as determined in the Annual Assessment or the gap between supply and demand at any time due to an unforeseen event that interrupts water supplies. The six shortage stages correspond to 10, 20, 30, 40, 50 percent, and greater than 50 percent shortage compared to the normal reliability conditions.

As stated in CWC Section 10632(a)(3) and the 2020 UWMP Guidebook, an urban water supplier's existing WSCP that uses different water shortage levels may comply with these six levels by developing a cross-reference relating the existing categories to the six standard water shortage levels. Table 8-1 displays the GCSD existing water conservation phases and their relationship to the six standard water shortage states prescribed by the CWC and the 2020 UWMP Guidebook.

Mandated State Standard Levels		Cross Walk	GCSD Corresponding Shortage Levels		
Shortage Level	Percent Shortage Range		GCSD Shortage Level	Percent Supply Reduction	Shortage Response Actions
1	Up to 10%		1	Up to 10%	Ongoing Conservation Measures
2	Up to 20%		2	Up to 10%	Voluntary Conservation Measures
3	Up to 30%		3	10% to 20%	Mandatory Conservation Measures
4	Up to 40%		4	20% to 50%	Mandatory Conservation Measures for Extreme Emergency
5	Up to 50%				
6	>50%				

## 8.5. Shortage Response Actions

*CWC Section 10632 (a)(4)*

*Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:*

- (A) Locally appropriate supply augmentation actions.*
- (B) Locally appropriate demand reduction actions to adequately respond to shortages.*
- (C) Locally appropriate operational changes.*
- (D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.*
- (E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action*

In accordance with CWC Section 10632(a)(4), this section describes the response action that may be implemented or considered for each water shortage level to minimize social and economic impacts to the community. The GCSD expects to mitigate supply shortages through a variety of response actions including demand reduction actions, conservation, operational changes, outreach, and mandatory prohibitions.

For this 2020 UWMP, this WSCP identifies various actions to be considered by the GCSD during water shortage conditions. In the event of a water shortage, the GCSD will evaluate the cause of the shortage to help inform which response actions should be implemented. Depending on the nature of the water shortage, the GCSD elect to implement a combination of response actions to mitigate the shortage and reduce gaps between supply and demand. It should be noted that implementation of each level is cumulative; meaning that implementation of a higher level shall also include implementation of all previous levels. If necessary, the GCSD may enact additional actions that are not listed in this WSCP. he stages determined by the percent water supply shortage are summarized in Table 8-2.

<b>Table 8-2 Water Shortage Contingency Plan Levels (Submittal Table 8-1)</b>			
<b>Shortage Level</b>	<b>Percent Shortage Range</b>	<b>Severity</b>	<b>Shortage Response Actions</b>
1	Up to 10%	Potential Shortage	Up to a 10% reduction in the GCSD's surface water supply due to any combinations of conditions.
2	Up to 20%	Minor Shortage	Between a 10% and 20% reduction in the GCSD's surface water supply due to any combinations of conditions.
3	Up to 30%	Moderate Shortage	Between a 20% and 30% reduction in the GCSD's surface water supply due to any combinations of conditions.
4	Up to 40%	Severe Shortage	Between a 30% and 40% reduction in the GCSD's surface water supply due to any combinations of conditions.
5	Up to 50%	Critical Shortage	Between a 40% and 50% reduction in the GCSD's surface water supply due to any combinations of conditions.
6	> 50%	Extreme Emergency Shortage	More than 50% reduction in the GCSD's surface water supply due to any combinations of conditions.

Depending on the stage of the water shortage, the GCSD may implement some combination of demand reduction, operational changes, and mandatory restrictions. Supply reductions required for each stage are included in Table 8-3 below.

<b>Table 8-3 Water Usage Reduction by State</b>		
<b>Shortage Level</b>	<b>Mandatory or Voluntary Percent Demand Reduction</b>	<b>Severity</b>
1	5%	Potential Shortage
2	10%	Minor Shortage
3	20%	Moderate Shortage
4	30%	Severe Shortage
5	50%	Critical Shortage
6	60%	Extreme Emergency Shortage

### **8.5.2. Demand Reductions**

The narrative below describes the specific rationing measures associated with each WSCP stage reported in this 2020 UWMP. The specific rationing measures for the six stages are summarized in Table 8-4.

The GCSD’s water customers will be required to comply with the applicable water conservation measures of the stage in effect. Voluntary and mandatory conservation reported in Article XVII of existing Ordinance No. 2-17 was used as a reference; however, the six states described below have been modified and updated to meet the requirements of the CWC.

#### **State 1 – Potential Shortage**

Stage 1 will always be in place as a water waste prohibition to provide a conservation program framework for reducing GCSD demands by up to 10 percent. During Stage 1, there is up to a 10 percent water supply shortage and a 5 percent or greater voluntary reduction in demand is suggested. The following conservation measures will be implemented during this stage:

- Education programs
- Promotion of water-saving landscaping.
- Requirement of low-flow fixtures in new developments.
- Meter and/or flow control for all customer accounts and plant production activities.
- Maintain tiered water rates for treated water.
- Prohibit wasteful use of water.
- Review water measuring and/or metering devices for accuracy.

#### **State 2 – Minor Shortage**

During Stage 2 of a water supply shortage, there is between a 10 to 20 percent water supply shortage and a 10 percent or greater mandatory reduction in water usage is required for the GCSD to meet the immediate needs of its customers. Water alert conditions are declared, the water shortage situation is explained to the public, and consumers are asked for a 10 percent or greater mandatory water use reduction. In addition to Stage 1 conservation measures, the GCSD will implement the following conservation measures during State 2:

- Prohibit fire hydrant flow testing.
- Restaurants shall serve water only upon customer request.
- Hotels, motels, and lodges must offer guests the option of not having towels and linens laundered daily by displaying notices prominently in each guestroom.
- The GCSD will contact the highest water users to encourage use of water conservation methods.
- Watering of lawns, gardens, and other outdoor vegetation by use of irrigation systems, hoses, faucets or other outlets connected to the public water supply is limited to three days a week. Landscape watering may be restricted to outside of peak demand hours.
- The GCSD will evaluate its water use for main flushing to see if reductions are possible.

#### **State 3 – Moderate Shortage**

During Stage 3, the water supply shortage is between 20 and 30 percent. The GCSD aggressively continues its public information and education programs. Consumers are asked for a 20 percent or greater

mandatory water use reduction. All requirements of Stages 1 and 2 remain in effect. Additional requirements include the following:

- Watering of lawns, gardens, and other outdoor vegetation by use of irrigation systems, hoses, faucets, or other outlets connected to the public water supply is limited to two days per week and based on the following schedule:
  1. Properties with addresses ending in an even number may irrigate only on Tuesday and Thursday.
  2. Properties with addresses ending in an odd number may irrigate only on Wednesday and Friday.
  3. Irrigation may occur only between 7:00 p.m. and 9:00 a.m.
- Washing of sidewalks, walkways, driveways, patios, parking lots, graveled areas, tennis courts or other hard-surfaced areas, including residential and commercial establishments, by hose or by use of water from faucets or other outlets connected to the public water supply is prohibited.
- Irrigation which results in water running onto driveways, gutters, streets, adjoining property, and/or any other water runoff is prohibited.
- Main flushing is only done on a sand, odor, or taste complaint basis or due to contamination and public health reasons.
- Excessive water use, without reasonable cause as determined by the GCSO, is prohibited. Excessive water use is defined as monthly water use that exceeds a certain percentage of the prior year's usage for the same month. The percentage varies based on the reduction goal and is determined by the following chart:

Reduction Goal	Excessive Use Percentage
20%	90%
30%	80%
40%	70%
50%	50%
>50%	40%

#### **State 4 – Severe Shortage**

During Stage 4 of a water supply shortage, the shortage is between 30 and 40 percent and a 30 percent or greater reduction in water usage is required for the GCSO to meet the immediate needs of its customers. The GCSO aggressively continues its public information and education programs, and consumers are asked for a 30 percent or greater mandatory water use reduction. All requirements of Stages 1 through 3 remain in effect. Additional requirements include the following:

- Watering of lawns, gardens, and other outdoor vegetation by use of irrigation systems, hoses, faucets, or other outlets connected to the public water supply is limited to one day per week and based on the following schedule:
  1. Properties with addresses ending in an even number may irrigate only on Tuesday.
  2. Properties with addresses ending in an odd number may irrigate only on Friday.
  3. Irrigation may occur only between 7:00 p.m. and 9:00 a.m.

- New construction service applications shall be granted upon condition that water shall be used only for interior purposes and landscaping that does not require watering. Any landscaping requiring the use of water shall be delayed until repeal of Stage 4 restrictions.
- Use of water in decorative fountains, pools, recreational ponds, and the like shall be limited to the minimum necessary to preserve aquatic life if present.
- Filling of new or existing swimming pools, spas and recreation ponds is prohibited.
- Allowing any plumbing system leak to remain un-repaired, without reasonable cause as determined by the GCSD, for seven calendar days following written notification by the District is prohibited.

#### **State 5 – Critical Shortage**

During Stage 5, there is between a 40 to 50 percent water supply shortage and a 50 percent or greater reduction in water usage is required for the GCSD to meet the immediate needs of its customers. The GCSD aggressively continues its public information and education programs, and consumers are asked for a 50 percent or greater mandatory water use reduction. All requirements of Stages 1 through 4 remain in effect. Additional requirements include the following:

- Immediately notify appropriate media outlets, and post local road signage notifying the public of the current water use restrictions.
- Watering of lawns, gardens, and other outdoor vegetation by use of irrigation systems, hoses, faucets, or other outlets connected to the public water supply is strictly prohibited.
- Washing of cars, boats, trailers, equipment, or other vehicles by hose or by use of water directly from faucets or outlets connected to the public water supply is prohibited. Washing such vehicles may occur at a commercial washing facility approved by the GCSD that utilize water recycling capabilities.
- Use of water for dust control, earth compaction, and other outdoor construction activities is prohibited.
- Fire hydrants shall be used only for emergency purposes.

#### **State 6 – Extreme Emergency Shortage**

During Stage 6, the water supply shortage is over 50 percent and a 60 percent or greater reduction in water usage is required for the GCSD to meet the immediate needs of its customers. The GCSD continues its public information and education programs and asks customers for a 60 percent or greater mandatory water use reduction. All requirements of Stages 1 through 5 remain in effect. Additional requirements include the following:

- Increased mandatory water use reduction.
- Commercial kitchens are required to use pre-rinse spray valves.

**Table 8-4 Demand Reduction Actions (Submittal Table 8-2)**

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Expand Public Information Campaign	5%	Education programs, promotion of water-saving landscaping.	Yes
1	Reduce System Water Loss	5%	Meter and/or flow control for all customer accounts and plant production activities. Review water measuring and/or metering devices for accuracy.	Yes
1	Other	5%	Requirement of low-flow fixtures in new developments.	Yes
1	Improve Customer Billing	5%	Maintain tiered water rates for treated water.	Yes
1	Other	5%	Prohibit wasteful use of water.	Yes
2	Other	10%	Prohibit fire hydrant flow testing.	No
2	CII - Restaurants may only serve water upon request	10%	Restaurants shall serve water only upon customer request.	Yes
2	CII - Lodging establishment must offer opt out of linen service	10%	Hotels, motels, and lodges must offer guests the option of not having towels and linens laundered daily by displaying notices prominently in each guestroom.	Yes
2	Increase Water Waste Patrols	10%	The GCSD will contact the highest water users to encourage use of water conservation methods.	Yes
2	Landscape - Limit landscape irrigation to specific days	10%	Watering of lawns, gardens, and other outdoor vegetation by use of irrigation systems, hoses, faucets or other outlets connected to the public water supply is limited to three days a week.	Yes
2	Decrease Line Flushing	10%	The GCSD will evaluate its water use for main flushing to see if reductions are possible.	No
3	Landscape - Limit landscape irrigation to specific days	20%	Properties with addresses ending in an even number may irrigate only on Tuesday and Thursday, while properties with addresses ending in	Yes



**Table 8-4 Demand Reduction Actions (Submittal Table 8-2)**

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
			an odd number may irrigate only on Wednesday and Friday.	
3	Landscape - Limit landscape irrigation to specific times	20%	Irrigation may occur only between 7:00 p.m. and 9:00 a.m.	Yes
3	Other - Prohibit use of potable water for washing hard surfaces	20%	Washing of sidewalks, walkways, driveways, patios, parking lots, graveled areas, tennis courts or other hard-surfaced areas, including residential and commercial establishments, by hose or by use of water from faucets or other outlets connected to the public water supply is prohibited.	Yes
3	Landscape - Restrict or prohibit runoff from landscape irrigation	20%	Irrigation which results in water running onto driveways, gutters, streets, adjoining property, and/or any other water runoff is prohibited.	Yes
3	Decrease Line Flushing	20%	Main flushing is only done on a sand, odor, or taste complaint basis or due to contamination and public health reasons.	Yes
3	Other	20%	Excessive water use, without reasonable cause as determined by the GCSO, is prohibited.	Yes
4	Landscape - Limit landscape irrigation to specific days	30%	Properties with addresses ending in an even number may irrigate only on Tuesday, while properties with addresses ending in an odd number may irrigate only on Friday..	Yes

**Table 8-4 Demand Reduction Actions (Submittal Table 8-2)**

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
4	Other	30%	New construction service applications shall be granted upon condition that water shall be used only for interior purposes and landscaping that does not require watering.	Yes
4	Water Features - Restrict water use for decorative water features, such as fountains	30%	Use of water in decorative fountains, pools, recreational ponds, and the like shall be limited to the minimum necessary to preserve aquatic life if present.	Yes
4	Other water feature or swimming pool restriction	30%	Filling of new or existing swimming pools, spas and recreation ponds is prohibited.	Yes
4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	30%	Allowing any plumbing system leak to remain un-repaired, without reasonable cause as determined by the GCS D, for seven calendar days following written notification by the District is prohibited.	Yes
5	Expand Public Information Campaign	50%	Immediately notify appropriate media outlets, and post local road signage notifying the public of the current water use restrictions.	Yes
5	Landscape - Prohibit all landscape irrigation	50%	Watering of lawns, gardens, and other outdoor vegetation by use of irrigation systems, hoses, faucets, or other outlets connected to the public water supply is strictly prohibited.	Yes
5	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	50%	Washing of cars, boats, trailers, equipment, or other vehicles by hose or by use of water directly from faucets or outlets connected to the public water supply is prohibited. Washing such vehicles may occur at a commercial washing facility approved by the GCS D that utilize water recycling capabilities.	Yes

**Table 8-4 Demand Reduction Actions (Submittal Table 8-2)**

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
5	Other - Prohibit use of potable water for construction and dust control	50%	Use of water for dust control, earth compaction, and other outdoor construction activities is prohibited.	Yes
5	Other	50%	Fire hydrants shall be used only for emergency purposes.	Yes
6	CII - Commercial kitchens required to use pre-rinse spray valves	60%	Commercial kitchens are required to use pre-rinse spray valves.	Yes

### 8.5.3. Supply Augmentation

Given that the SFPUC provides a sufficient surface water supply, the GCSD no immediate plan to augment supply in response to shortages.

### 8.5.4. Operational Changes

During shortage conditions, operations may be affected by demand reduction responses. Operational changes to address a short-term water shortage may be implemented based on the severity of the reduction goal. The GCSD will maximize its supply by implementing operational strategies and demand reduction measures.

As part of the Annual Assessment process, the GCSD will consider their operational procedures at the time of a shortage to identify changes that can be implemented to address water shortage on a short-term basis, including but not limited to:

- Expansion of public information campaign to educate and inform customers of the water shortage emergency and required water savings
- Decrease water main flushing to only on a compliant basis.
- Hydrant flushing will be suspending when Stage 2 or any subsequent state is declared.
- Review water metering devices for accuracy.
- Implement water waste patrols by recruiting staff from other departments, if necessary
- Implement or modify drought rate structure or surcharge or water emergency tiered pricing, pursuant to the requirements of Proposition 218 and in accordance with California Law
- Contact the highest water users to encourage use of water conservation methods.
- Monitor construction meters and fire hydrant meters for efficient water use in the event that a meter identified wastes water.

### 8.5.5. Emergency Response Plan

Water Code Section 10632(c) requires development of an Emergency Response Plan (ERP) documenting

actions to be undertaken by a water supplier to prepare for and implement during a catastrophic interruption of water supplies. A catastrophic event that constitutes a proclamation of a water shortage would be any event, either natural or manmade, that causes a severe shortage of water. Water shortages may result from variations in weather, natural disasters, or unanticipated situations (i.e. systems failures, acts of terror).

The GCSD has included emergency conditions as a triggering action for advancement to a subsequent shortage level. A catastrophic interruption could be considered an emergency condition. The GCSD has also prepared an ERP, which was last updated in April 2019. The ERP provides the GCSD with a standardized response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of man-made or natural origin. The ERP also describes how the GCSD will respond to potential threats or actual terrorist scenarios identified in the vulnerability assessment, as well as additional emergency response situations. Specific action plans are included in Appendix A of the ERP, which detail how the GCSD will respond to emergency events and incidents.

#### **8.5.6. Seismic Risk Assessment and Mitigation Plan**

*Section 10632.5.(a)*

*In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.*

*(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.*

*(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.*

The GCSD's water system infrastructure, including treatment plants, pump stations, storage tanks, and pipelines, could be damaged during a strong earthquake. GCSD is located in USGS Earthquake Zone 3 = 0.30g. Although the GCSD is not located within a highly active seismic zone, some facilities could be damaged as the result of an earthquake up to a magnitude of 6.0 on the Richter scale. The GCSD has planned for this potential by constructing redundancy into its water system. GCSD has two existing permanent water treatment plants, a mobile Alternative Water Supply (AWS) microfiltration plant, multiple storage tanks, looped distribution pipelines, and isolation valves, to allow potentially damaged portions of GCSD's system to be isolated and repaired. Action Plan 8C included in Appendix A of the GCSD's ERP details how the GCSD will respond during an earthquake.

#### **8.5.7. Shortage Response Action Effectiveness**

The GCSD's water system currently has water meters on all water intake sources and customer connections. These meters record the amount of water consumed at each location. Customer consumption totals are tallied on a monthly basis for billing purposes. The GCSD's billing staff will inform the General Manager of any increase in water consumed or decrease in water supplies. The General Manager will then make recommendations to the Board of Directors on whether to change water shortage levels and will provide supporting reports of consumption or supply as required.

Under normal water supply conditions, water supply and consumption figures are reported, at minimum, on a monthly basis. From this information, month-to-month and year-to-year statistics can be calculated to track water use and subsequent increases or reductions in consumption levels. This data allows the GCSD to determine the effectiveness of the implemented shortage response actions. If reduction goals are not being met, the Board of Directors make the necessary decisions for corrective action to be taken.

During water shortages, savings are measured in comparison to what is considered to be normal year demand or in reference to a specific base year as may be dictated by Statewide requirements. Estimates of the effectiveness for actions has been included in Table 8-4. It is assumed that a given required shortage to be addressed in each stage can be met by quantifiable measures and the remainder of shortage can be addressed by unquantifiable measures or operational changes. It is expected that response action effectiveness is also a result of successful communication and outreach efforts made by the GCSD.

## **8.6. Communication Protocols**

### *Section 10632 (a)(5)*

*Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:*

*(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.*

*(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.*

*(C) Any other relevant communications*

Communications regarding water shortage and conservation efforts will be sent to individual customers and will be available through media and GCSD's website. When conservation measures are needed, the GCSD will create a bill insert with conservation information, post additional conservation information on its website and host informational sessions to inform the public of water shortage and conservation efforts. The insert, online campaign, and informational sessions will focus on providing examples of ways consumers can reduce their water usage and optional programs they can take part in such as home reuse of greywater, maintenance of leaks, and high efficiency fixture installation. Additional information will be provided on water usage reduction and the water shortage surcharge that will be implemented.

When a shortage level is enacted or changed, a notice will be mailed to customers and posted on the GCSD's website. Based on the severity of the shortage, the GCSD may also advertise on the local radio, publish in special publications, hang door tags, or send additional mail notifications to all its customers.

## **8.7. Compliance and Enforcement**

### *CWC Section 10632 (a)(6)*

*For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

The GCSD existing Ordinance No. 217 establishes the following penalties for excessive water use violations:

1. First Violation: Customer will receive a written warning from GCSD that a further violation will result in water restrictions and penalties.
2. Second Violation: Payment of \$50 penalty.
3. Third Violation: Payment of a \$100 penalty and customer's service will be restricted by a flow restriction device for 30 days.
4. Fourth Violation: Payment of a \$500 penalty and customer's water service will be restricted (at the customer's cost) by a flow restriction device until GCSD repeals the state of emergency, threat of emergency or shortage.
5. Continued Violation: Payment of a \$500 penalty and continued water service restriction. GCSD may, in its discretion, pursue misdemeanor charges pursuant to Water Code Section 71644 which may result in imprisonment in the county jail for not more than 30 days, or by fine not exceeding \$600, or by both.

## 8.8. Legal Authorities

*CWC Section 10632 (a)(7)*

*(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.*

*(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1. [see below]*

*(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.*

*Water Code Section Division 1, Section 350*

*Declaration of water shortage emergency condition. The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.*

Implementation of the WSCP and the articles set forth in Ordinance No. 2-17 shall be determined by the Board of Directors through the adoption of a Resolution. A water shortage emergency declaration shall be in effect upon proper findings made by the Board of Directors after a public hearing and shall remain in effect until the Board of Directors finds and declares by resolution that the water shortage emergency condition has abated, has changed in degree, or no longer exists.

Per Ordinance No. 2-17, the Board of Directors shall conduct duly noticed public hearings for the purpose of determining whether a water shortage emergency condition exists and, if so, the degree of the emergency and what regulations and restrictions should be enforced in response to the shortage. The Board of Directors shall adopt a resolution which declares that a water shortage emergency condition exists, the facts and conclusions which support such a declaration and that the ordinary water demands and requirements of water consumers within the District cannot be satisfied.

## 8.9. Financial Consequences of WSCP Activation

*CWC Section 10632(a)(8)*

*A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:*

*(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).*

*(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).*

*(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1. [retail urban suppliers only]*

All of the GCS D's service connections are metered; therefore, the GCS D's water fund operating revenue will be closely tied to water use and significantly impacted by the water conservation measures in the WSCP. With the implementation of the WSCP, expenditures may increase due to an increase in the water conservation reduction methods described in this Chapter and revenue from water bills may decrease due to the reduction in water use encouraged in the WSCP's stages. To counteract the financial impact of conservation, the GCS D institute an increase in the rate structure so that lower projected water consumption would generate added revenue needed by the GCS D's water fund. Another option would be the use of reserve funds to minimize the need for additional rate increases. A full analysis of the water rates based on the financial conditions at the time water reduction would occur would be presented to the Board of Directors for their approval. Additionally, the GCS D' may consider temporarily increasing water rates or delaying capital improvements until the shortage has ended.

## 8.10. Monitoring and Reporting

*CWC Section 10632(a)(9)*

*For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.*

In accordance with CWC Section 10632(a)(9), this section describes the reporting requirements and monitoring procedures to implement the WSCP and track and evaluate the response actions effectiveness. As previously stated in Section 8.2, the GCS D intends to track its water supply purchased from the SFPUC and customers' demands on an annual basis, and if a supply shortage is projected, the GCS D will implement the appropriate stage of their WSCP, as declared by the Board of Directors. Monitoring customer water demands will be essential to ensure that the WSCP's response actions are adequately meeting reductions and decreasing the supply/demand gap. This will help to analyze the effectiveness of the WSCP or identify the need to activate additional response actions or implement a subsequent stage.

Water savings associated with the implementation of the WSCP will be determined based on customer's monthly water metered records which will be compared to meter records from prior months or the same period of the prior year. At first, the cumulative consumption of residential and commercial customers will be evaluated for reaching target demand reduction levels. If needed, individual customer accounts will be monitored. Weather and other possible influences may be accounted for in the evaluation.

The GCSD will report the impact of demand reductions actions to the Board of Directors and to the State, if required. The GCSD will also update its customers as to the impact of the actions taken as part of their customer outreach program.

### **8.11. WSCP Refinement Procedures**

*CWC Section 10632 (a)(10)*

*Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

This WSCP is best prepared and implemented as an adaptive management plan. The GCSD will use results obtained from their Annual Assessment and monitoring and reporting program described above to evaluate any needs for revisions. The WSCP is used to provide guidance to the GCSD staff, Board of Directors, and the public by identifying response actions to allow for efficient management of any water shortage with predictability and accountability.

To maintain a useful and efficient standard of practice in water shortage conditions, the requirements, criteria, and response actions need to be continually evaluated and improved upon to ensure that its shortage risk tolerance is adequate, and the shortage response actions are effective and up-to-date based on lessons learned from implementing the WSCP's stages. Potential changes to the WSCP that would warrant an update include, but are not limited to, any changes to shortage level triggers, changes to the shortage level structure, and/or changes to the response actions. Any prospective changes to the WSCP would need to be presented at a public Board meeting, GCSD staff would obtain any comments from the public and the Board of Directors, and Board of Directors would formally approve the updated WSCP through the adoption of a Resolution.

### **8.12. Special Water Feature Distinction**

*CWC Section 10632 (b)*

*For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.*

CWC 10623 (b) now requires that suppliers analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code. Non-pool or non-spa water features may use or be able to use recycled water, whereas pools and spas must use potable water for health and safety considerations, so limitations to pools and spas may require different considerations compared to non-pool or non-spa water features.

For the purposes of the WSCP, water features are not categorized under defined terminology. Pools, spas, recreational ponds, decorative fountains, and the like will all be called out specifically during each stage that requires their decrease or fully terminated use.



### **8.13. Plan Adoption, Submittal, and Availability**

*CWC Section 10632 (c)*

*The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

The WSCP followed the same development process as the GCSD's 2020 UWMP. The WSCP shall be adopted, submitted, implemented, and amended alongside the GCSD's UWMP. The GCSD had a public review period of the 2020 UWMP, which included the WSCP, from September 3, 2021 to November 9, 2021. The Final UWMP and WSCP were presented to the Board of Directors for approval on \_\_\_\_\_, 2021 and were adopted. The Final 2020 UWMP and WSCP were submitted to the California Department of Water Resources on \_\_\_\_\_, 2021. The GCSD will make the Final 2020 UWMP and WSCP publicly available through the GCSD's website no later than 30 days after it is adopted. The public will also be notified of any amendments to the WSCP which will be made public available once adopted.

## CHAPTER 9 - DEMAND MANAGEMENT MEASURES

### 9.1. Introduction

Demand management measures (DMMs) are specific actions a water supplier takes to support its water conservation efforts. The goal of this Chapter is to provide a comprehensive description of the water conservation programs that the GCSO has implemented, is currently implementing, and plans to implement in order to meet its urban water use reduction targets.

The section of the CWC addressing DMMs was significantly modified in 2014, based on recommendations from the Independent Technical Panel (ITP) to the legislature. The ITP was formed by DWR to provide information and recommendations to DWR and the Legislature on new demand management measures, technologies and approaches to water use efficiency. In its report to the Legislature, the ITP recommended that the UWMP Act should be amended to simplify, clarify, and update the DMM reporting requirements. The ITP recommended, and the legislature enacted, streamlining the retail agency requirements from 14 specific measures to six more general requirements plus an “other” category.

The GCSO realizes the importance of DMMs to ensure a reliable future water supply. The GCSO is committed to implementing water conservation programs to maximize sustainability in meeting future water needs for its customers. The following sections provide a description of the GCSO’s DMMs.

### 9.2. Demand Management Measures for Retail Agencies

*CWC Section 10631*

*(e) Provide a description of the supplier’s water demand management measures. This description shall include all of the following:*

*(1)(A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measure that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

*(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*

*(i) Water waste prevention ordinances.*

*(ii) Metering.*

*(iii) Conservation pricing.*

*(iv) Public education and outreach.*

*(v) Programs to assess and manage distribution system real loss.*

*(vi) Water conservation program coordination and staffing support.*

*(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

The UWMP Act requires a discussion of DMMs, including a description of each of the DMMs currently being implemented/scheduled for implementation, the schedule of implementation for all DMMs, and the methods, if any, the City will use to evaluate the effectiveness of DMMs.

### **9.2.1. Water Waste Prevention Ordinance**

This DMM consists of adopting and enforcing a water waste ordinance that explicitly states that the waste of water is to be prohibited. The ordinance must prohibit specific actions that waste water, such as excessive runoff from landscape irrigation, or use of a hose outdoors without a shut off nozzle.

On March 8, 2010, the GCSD Board of Directors adopted Ordinance 2-10 “Water” (Ordinance 2-10), which established the rules and regulations regarding the provision of water service within the boundaries of the GCSD’s service area. As of March 13, 2017, the GCSD Board of Directors adopted Ordinance No. 2-17 to replace Ordinance 2-10 in full. Article XVII, “Drought Restriction,” sets forth water shortage emergency conditions that exist with the GCSD’s boundary as declared by resolution of the Board of Directors.

The GCSD updated Article XVII in order to meet the new requirements DWR has established for this 2020 UWMP. As reported in Chapter 8, the wasteful use of water is prohibited under Stage 1, which is in effect all times, regardless of the existence of a water shortage emergency. Since the 2015 UWMP, the GCSD has expanded its public outreach and education on water conservation and has increased enforcement of water waste prohibitions within their service area.

### **9.2.2. Metering**

*CWC Section 526*

*(a) Notwithstanding any other provisions of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract... shall do both of the following:*

*(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings... located within its service area.*

*Water Code Section 527*

*(a) An urban water supplier that is not subject to Section 526 shall do both the following:*

*(1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.*

This DMM requires that water meters be installed for all new connections to allow billing by volume of use. This program also applies to retrofitting any existing unmetered connections. Per Article VI, Section 6.1 of Ordinance No. 2-17, all water service shall be metered. Currently, all of the GCSD’s service connections are metered. Additionally, the GCSD evaluates customer records and conducts water audits prioritized by high consumption to initiate action to reduce water usage by these customers.

### **9.2.3. Conservation Pricing**

A conservation pricing structure is already in place and is not dependent upon a water shortage. GCSD’s rate structure is designed to promote conservation by providing a 3,300-gallon monthly consumption-rate per Equivalent Dwelling Unit (EDU) at \$0.00765 per gallon. Water usage above 3,300 gallons is billed at the Peak Demand Rate of 0.01514 per gallon.

#### **9.2.4. Public Education and Outreach**

The GCSO distributes public information regarding water issues in mass mailings to all water service customers, through the GCSO's website, and directly to walk-in customers at the administration building. Also, when warranted, time-critical public information is dispersed through the local print media, radio station announcements, and public events.

Water use regulations and the annual Drinking Water Consumer Confidence Report (water quality report) are mailed each year to all customers. The GCSO takes advantage of these mailings when necessary to provide its customers additional information on water conservation and other demand management measures. Display cases and bulletin boards at the GCSO's facilities augment the mailings by providing a permanent posting of the most current mailings.

Additionally, the GCSO monthly water bill that is distributed to all water service customers is another vehicle used for public education purposes, including relevant water consumption bar graphs comparing amount use to baseline period. The bill mailing also contains public service announcements that are used to remind citizens of conservation and demand management measures.

#### **9.2.5. Programs to Assess and Manage Distribution System Real Loss**

The GCSO recognizes distribution system leakage can be a primary type of loss. While it is essential to control losses, the initial step is to assemble a water audit to identify the nature and volumes of losses and financial impacts that these losses exert.

#### **9.2.6. Water Conservation Program Coordination and Staffing Support**

The GCSO's General Manager is the designated Water Conservation Coordinator. In addition, staff supports the coordinator and the water conservation activities of the GCSO and its customers. The Water Conservation Coordinator's responsibilities include:

- Coordination with internal departments and the community at large to promote the principles of responsible water resource stewardship.
- Monitoring the practice and application of DMMs.
- Supervising the activities of the Water Patrol (only if in place).
- Planning and participating in community water conservation education projects.

The Water Conservation Committee has authorized use of the GCSO's funds to support water conservation efforts.

#### **9.2.7. Other Demand Management Measures**

##### **9.2.7.1. Low-Flow Toilet Rebate Program**

This program benefits existing customers by reducing their water consumption while minimizing the impact of their lifestyle. State legislation requires the installation of efficient plumbing in new construction, and effective 1994 requires that only Ultra Low Flush Toilets be sold in California.

Several studies suggest that savings resulting from miscellaneous interior retrofit fixtures can range between 25 and 65 gallons per day per housing unit. The studies also suggest that installation of retrofit

fixtures in older single-family homes tend to produce more savings, while newer multi-family homes tend to produce less savings per housing unit.

This program provides a financial incentive (rebate offer) of \$100 to qualifying GCSD's customers who install a Low-Flow Toilet rated 1.6 gallons per Flush (or less) in their home. To qualify, customers must provide proof of purchase of a Low-Flow Toilet after July 1, 2014 and provide a copy of their water bill. This program is available to all GCSD customers on a first come first serve basis.

#### **9.2.7.2. Low-Flow Shower Head Rebate Program**

This program generally provides a financial incentive (rebate offer) of \$20 to GCSD's qualifying customers who install low-flow shower head, 1.5 gallons per minute (or less) in their home. This program is also offered to all GCSD customers on a first come first serve basis, maximum two shower head rebates per customer.

#### **9.2.7.3. Low Water Use Discount on Water and Sewer Bill**

GCSD has both Sewer and Water Rate Studies in progress that include options to implement rate structures that reduces the fixed monthly portion of water bills for customers who use less water, hence putting less demand on the infrastructure. This reward is an incentive for customers already using low volumes of water to possible conserve even more.

#### **9.2.7.4. Leak Adjustment Policy**

The GCSD maintains a Leak Adjustment Policy, which authorizes the General Manager or their designee to adjust a customer's water service account when their bill reflects usage that is significantly greater than normal, due to accidental loss of water through broken pipes or other failures in the property's indoor plumbing system. The Policy is subject to the following conditions:

1. The account shows no record of being delinquent for more than 60 days during the past 24 months.
2. One adjustment will be granted within a 24 month period.
3. The customer certifies in writing that the problem causing the usage has been repaired and/or resolved within 14 calendar days of being notified or when the leak was discovered.
4. Leak adjustments must be applied for in writing within 30 days of receipt of billing.
5. No leak adjustments will be granted for loss of water due to irrigation failures.
6. No leak adjustments will be granted for properties operated or used as vacation rentals.
7. No leak adjustments will be granted during District declared drought status.
8. Upon approval, the GCSD will take water that is in excess of the prior year's same billing period for normal consumption and bill each gallon at the GCSD's Base Usage Rate.

### **9.3. Reporting Implementation**

#### **9.3.1. Implementation over the Past Five Years**

*CWC Section 10631*

*(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1)(A) For an urban retail water supplier, ... a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.*

The following is a description of the water conservation efforts that GCSD has implemented over the last five years:

I. Ordinance

In 2017, GCSD updated its Water Ordinance No. 2-17. The updated Ordinance served to modify and expand upon the rules and regulation of the water system, including water conservation regulations and water shortage contingency measures.

II. Metering

All of the GCSD service connections are currently metered. The GCSD utilize manual water meters to monitor and record the water usage within each active connection. The GCSD is currently seeking grant funding to replace the existing system with an Automatic Metering Reading (AMR) system that will transfer meter readings through the implementation of a fixed network.

III. Conservation Pricing

Currently, the GCSD's rate structure includes a monthly service charge based upon the size of the customer's meter, in addition to a volumetric or commodity charge based upon the total volume of water consumed by the customer during the billing period.

IV. Public Education and Outreach

The programs described above were either expanded or started in the last five years.

V. Water Distribution System Losses

A Leak Adjustment Policy was implemented to adjust a customer's water service account when their bill reflects usage that is significantly greater than normal, due to accidental loss of water through broken pipes or other failures in the property's indoor plumbing system. The GCSD uses the AWWA method to annually evaluate its distribution system losses each calendar year. Since 2016, the GCSD has submitted a validated annual water audit report to the DWR for review and approval.

VI. Water Conservation Program Coordination and Staffing Support

The GCSD has enlisted the assistance of all staff in any GCSD department that is in the field for purposes of reporting running water or potential waste. These outside working staff are to report such observations to water department staff. The GCSD has begun working closely with school districts and other agencies within the service area to secure their cooperation with regard to conservation.

### **9.3.2. Implementation to Achieve Water Use Targets**

*CWC Section 10631*

*(e)(1)(A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the*

*past five years. The narrative shall describe the water demand management measure that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

The DMMs implemented by the GCSD are discussed in Section 9.2, while details regarding the nature and extent of these DMMs implemented by the GCSD over the past five years are presented in Section 9.3. The GCSD will continue to implement these DMMs and other water conservation programs and work to provide water conservation programs or additional water rebate programs to its residents.

#### **9.4. Water Use Objectives (Future Requirements)**

Within the next year, the GCSD plans to begin working with the DWR to develop Water Use Objectives pursuant to AB 1668 and SB 606. Beginning in 2024, water agencies, including the GCSD, are required to begin reporting compliance of their Water Use Objectives consisting of indoor residential water use, outdoor residential water use, commercial, industrial and institutional, irrigation with dedicated meters, water loss, and other unique local uses. The GCSD plans to meet its Water Use Objectives through continued implementation of the water conservation measure DMMs discussed in this 2020 UWMP.

## **CHAPTER 10 - PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION**

### **10.1. Inclusion of all 2020 Data**

This 2020 UWMP includes the water use and planning data for the entire calendar year 2020.

### **10.2. Notice of Public Hearing**

Water suppliers must hold a public hearing prior to adopting the 2020 UWMP. The public hearing provides an opportunity for the public to provide input on the Plan before it is adopted. The GCSD Board of Directors shall consider all public input before the 2020 UWMP is adopted.

#### **10.2.1. Notice to Cities and Counties**

*CWC Section 10621*

*(b) Every urban water supplier required to prepare a plan shall...at least 60 days prior to the public hearing on the plan...notify any city or county within which the supplier provides waters supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.*

*CWC Section 10642*

*...The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area...*

The GCSD is the sole water supplier and water management agency for the area. For this reason, GCSD did not participate in an area, regional, watershed, or basin wide UWMP. While preparing the 2020 UWMP, however, GCSD coordinated its efforts with relevant agencies to ensure that the data and issues discussed in the UWMP are presented accurately.

The GCSD provided formal written notification to the City of Sonora, San Francisco Public Utilities Commission, and Tuolumne County that GCSD's 2020 UWMP was being prepared. Copies of the Notification letters are included in Appendix B. Copies of the final UWMP will be provided to City of Sonora, San Francisco Public Utilities Commission, and Tuolumne County no later than 30 days after its submission to DWR.

#### **10.2.1.1.60-Day Notification**

As discussed in Section 2.5, the GCSD coordinated the preparation of this 2020 UWMP with the San Francisco Public Utilities Commission, City of Sonora, Tuolumne County and the Turlock Irrigation District. The GCSD notified these agencies, at least sixty (60) days prior to the public hearing, invited them to provide comments on the draft 2020 UWMP and WSCP. A copy of the notification letters sent to these agencies is provided in Appendix J.



### 10.2.1.2. Notice of Public Hearing

*Government Code Section 7291*

*...every local public agency... serving a substantial number of non-English-Speaking people, shall employ a sufficient number of qualified bilingual persons in public contact positions or as interpreters to assist those in such positions, to ensure provision of information and services in the language of the non-English-speaking person.”*

The GCS D published a notice of the public hearing in the \_\_\_\_\_ on \_\_\_\_\_, 2021, and \_\_\_\_\_, 2021. A copy of the publication is provided in Appendix J.

### 10.2.1.3. Submittal Tables

Table 10-1 summarizes the cities and counties which were provided notifications by the GCS D.

<b>Table 10-1 Notification to Cities and Counties (Submittal Table 10-1)</b>		
City Name	60 Day Notice	Notice of Public Hearing
City of Sonora	Yes	Yes
San Francisco Public Utilities Commission	Yes	Yes
County Name	60 Day Notice	Notice of Public Hearing
Tuolumne County	Yes	Yes

### 10.2.2. Notice to Public

*CWC Section 10642*

*...Prior to adopting either [the plan or water shortage contingency plan], the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code [see below]. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies.*

*Government Code section 6066*

*Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.*

The GCS D encouraged the active involvement of the population within its service area prior to and during the preparation of the UWMP. Pursuant to Section 6066 of the Government Code, the GCS D published a notice of public hearing in the newspaper on September 2, 2021 and September 9, 2021. A notice of public hearing was also posted on the GCS D’s website. A copy of the published notice is provided in Appendix K.

### 10.3. Public Hearing and Adoption

*CWC Section 10642*

*...Prior to adopting either, the [plan or water shortage contingency plan], the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon.*

*Water Code Section 10608.26*

*(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:*

*(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.*

*(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.*

*(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20 for determining its urban water use target.*

Pursuant to the requirements of the UWMPA, this section summarizes the adoption, submittal, and implementation of GCSD's 2020 UWMP.

#### 10.3.1. Public Hearing

Prior to adopting the draft 2020 UMWP and the WSCP, the GCSD held a public hearing on November 9, 2021, which included input from the community regarding the GCSD's draft 2020 UWMP and WSCP.

#### 10.3.2. Adoption

*CWC Section 10642*

*...After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.*

Following the public hearing, the GCSD adopted both the draft 2020 UWMP and draft WSCP (included in Chapter 8 of the UWMP). A copy of the resolution adopting the 2020 UWMP and the WSCP is provided in Appendix L.

### 10.4. Plan Submittal

*CWC Section 10621*

*(e) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021 ...*

*Water Code Section 10644*

*(a)(1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption.*

*Water Code Section 10635*

*(c) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.*

The GCSD’s submittal process for its 2020 UWMP is discussed below.

#### **10.4.1. Submitting a UWMP and Water Shortage Contingency Plan to DWR**

The GCSD Board of Directors adopted the 2020 UWMP and WSCP on November 9, 2021,, and within 30 days of adoption, the GCSD submitted the adopted 2020 UWMP (including the WSCP) to DWR. The 2020 UWMP was submitted through DWR’s “Water Use Efficiency (WUE) Data Portal” website.

The DWR developed a checklist which was used by the GCSD to assist DWR with its determination that the GCSD’s 2020 UWMP has addressed the requirements of the CWC. The GCSD has completed the DWR checklist by indicating where the required CWC elements can be found within the GCSD’s 2020 UWMP, and it is included in Appendix M.

#### **10.4.2. Electronic Data Submittal**

*Section 10644 (a)(2)*

*The plan, or amendments to the plan, submitted to the department ... shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.*

Within 30 days of adoption of the 2020 Plan, the GCSD submitted all data tables associated with the 2020 UWMP through DWR’s “Water Use Efficiency Data Portal” website.

#### **10.4.3. Submitting UWMP, including WSCP, to the Cities and Counties**

Within 30 days of adoption of the 2020 UWMP by the Board of Directors, a copy (CD or hardcopy) of the 2020 UWMP was submitted to the State of California Library. A copy of the letter to the State Library will be maintained in the GCSD’s file. The 2020 UWMP will be mailed to the following address if sent by regular mail:

California State Library  
Government Publications Section  
Attention: Coordinator, Urban Water Management Plans  
P.O. Box 942837  
Sacramento, CA 94237-0001

#### **10.4.4. Submitting UWMP to the Cities and Counties**

Within 30 days of adoption of the 2020 UWMP by the Board of Directors, a copy of the 2020 was submitted to the San Francisco Public Utilities Commission, Tuolumne County, and the City of Sonora.

### **10.5. Public Availability**

*CWC Section 10645*

*(a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

*(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

Within 30 days after submittal of the 2020 UWMP to the DWR, the GCSD made the final 2020 UWMP (including the WSCP) available for public review at the GCSD’s Administration Building during normal business hours. In addition, a copy of the final 2020 UWMP will also be posted on the GCSD’s website.

## **10.6. Notification to Public Utilities Commission**

*CWC Section 10621 (c)*

*An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier’s general rate case filings.*

The GCSD is not regulated by the California Public Utilities Commission

## **10.7. Amending an Adopted Plan**

*Section 10621*

*(d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).*

*Water Code Section 10644*

*(a)(1) Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.*

The GCSD’s amendment process for the 2020 UWMP and WSCP is discussed below.

### **10.7.1. Amending a UWMP**

If major changes are made to this 2020 UWMP, the amended UWMP will undergo adoption by the GCSD’s Board of Directors. Within 30 days of adoption, the amended Plan will then be submitted to DWR, the State of California Library, and Tuolumne County.

### **10.7.2. Amending a Water Shortage Contingency Plan**

*Section 10644 (b)*

*If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared...no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.*

If the GCSD amends the adopted 2020 UWMP (including the WSCP), the amended UWMP (and WSCP) will undergo adoption by the GCSD’s Board of Directors. Within 30 days of adoption, the amended Plan will then be submitted to DWR, the State of California Library, and Tuolumne County.

**APPENDIX A**  
**LEGISLATIVE REQUIREMENTS**

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## WATER CODE - WAT

### DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999] (Heading of Division 6 amended by Stats. 1957, Ch. 1932. )

#### PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 - 10609.42] ( Part 2.55 added by Stats.2009, 7th Ex. Sess., Ch. 4, Sec. 1. )

#### CHAPTER 1. General Declarations and Policy [10608 - 10608.8] ( Chapter 1 added by Stats. 2009, 7th Ex. Sess., Ch. 4, Sec. 1. )

### 10608.

The Legislature finds and declares all of the following:

- (a) Water is a public resource that the California Constitution protects against waste and unreasonable use.
- (b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.
- (c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.
- (d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve stream flows, and reduce greenhouse gas emissions.
- (e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.
- (f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.
- (g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.
- (h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.
- (i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

(Added by Stats. 2009, 7th Ex. Sess., Ch. 4, Sec. 1. (SB 7 7x) Effective February 3, 2010.)

### 10608.4

It is the intent of the Legislature, by the enactment of this part, to do all of the following:

- (a) Require all water suppliers to increase the efficiency of use of this essential resource.
- (b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.
- (c) Measure increased efficiency of urban water use on a per capita basis.
- (d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.
- (e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.
- (f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.
- (g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.
- (h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.
- (i) Require implementation of specified efficient water management practices for agricultural water suppliers.
- (j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.
- (k) Advance regional water resources management.

(Added by Stats. 2009, 7th Ex. Sess., Ch. 4, Sec. 1. (SB 7 7x) Effective February 3, 2010.)



## **10608.8**

(a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision

(a) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021.

Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

*(Added by Stats. 2009, 7th Ex. Sess., Ch. 4, Sec. 1. (SB 7 7x) Effective February 3, 2010.)*



## WATER CODE - WAT

**DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999]** (*Heading of Division 6 amended by Stats. 1957, Ch. 1932.*)

**PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 - 10609.42]** (*Part 2.55 added by Stats. 2009, 7th Ex. Sess., Ch. 4, Sec. 1.*)

**CHAPTER 9. Urban Water Use Objectives and Water Use Reporting [10609 - 10609.38]** (*Chapter 9 added by Stats. 2018, Ch. 15, Sec. 7.*)

**10609.** (a) The Legislature finds and declares that this chapter establishes a method to estimate the aggregate amount of water that would have been delivered the previous year by an urban retail water supplier if all that water had been used efficiently. This estimated aggregate water use is the urban retail water supplier's urban water use objective. The method is based on water use efficiency standards and local service area characteristics for that year. By comparing the amount of water actually used in the previous year with the urban water use objective, local urban water suppliers will be in a better position to help eliminate unnecessary use of water; that is, water used in excess of that needed to accomplish the intended beneficial use.

(b) The Legislature further finds and declares all of the following:

(1) This chapter establishes standards and practices for the following water uses:

(A) Indoor residential use.

(B) Outdoor residential use.

(C) CII water use.

(D) Water losses.

(E) Other unique local uses and situations that can have a material effect on an urban water supplier's total water use.

(2) This chapter further does all of the following:

(A) Establishes a method to calculate each urban water use objective.

(B) Considers recycled water quality in establishing efficient irrigation standards.

(C) Requires the department to provide or otherwise identify data regarding the unique local conditions to support the calculation of an urban water use objective.

(D) Provides for the use of alternative sources of data if alternative sources are shown to be as accurate as, or more accurate than, the data provided by the department.

(E) Requires annual reporting of the previous year's water use with the urban water use objective.

(F) Provides a bonus incentive for the amount of potable recycled water used the previous year when comparing the previous year's water use with the urban water use objective, of up to 10 percent of the urban water use objective.

(3) This chapter requires the department and the board to solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter.

(4) This chapter preserves the Legislature's authority over long-term water use efficiency target setting and ensures appropriate legislative oversight of the implementation of this chapter by doing all of the following:

(A) Requiring the Legislative Analyst to conduct a review of the implementation of this chapter, including compliance with the adopted standards and regulations, accuracy of the data, use of alternate data, and other



issues the Legislative Analyst deems appropriate.

(B) Stating legislative intent that the director of the department and the chairperson of the board appear before the appropriate Senate and Assembly policy committees to report on progress in implementing this chapter.

(C) Providing one-time-only authority to the department and board to adopt water use efficiency standards, except as explicitly provided in this chapter. Authorization to update the standards shall require separate legislation.

(c) It is the intent of the Legislature that the following principles apply to the development and implementation of long-term standards and urban water use objectives:

(1) Local urban retail water suppliers should have primary responsibility for meeting standards-based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.

(2) Long-term standards and urban water use objectives should advance the state's goals to mitigate and adapt to climate change.

(3) Long-term standards and urban water use objectives should acknowledge the shade, air quality, and heat-island reduction benefits provided to communities by trees through the support of water-efficient irrigation practices that keep trees healthy.

(4) The state should identify opportunities for streamlined reporting, eliminate redundant data submissions, and incentivize open access to data collected by urban and agricultural water suppliers.

*(Amended by Stats. 2019, Ch. 497, Sec. 287. (AB 991) Effective January 1, 2020.)*

**10609.2.** (a) The board, in coordination with the department, shall adopt long-term standards for the efficient use of water pursuant to this chapter on or before June 30, 2022.

(b) Standards shall be adopted for all of the following:

(1) Outdoor residential water use.

(2) Outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.

(3) A volume for water loss.

(c) When adopting the standards under this section, the board shall consider the policies of this chapter and the proposed efficiency standards' effects on local wastewater management, developed and natural parklands, and urban tree health. The standards and potential effects shall be identified by May 30, 2022. The board shall allow for public comment on potential effects identified by the board under this subdivision.

(d) The long-term standards shall be set at a level designed so that the water use objectives, together with other demands excluded from the long-term standards such as CII indoor water use and CII outdoor water use not connected to a dedicated landscape meter, would exceed the statewide conservation targets required pursuant to Chapter 3 (commencing with Section 10608.16).

(e) The board, in coordination with the department, shall adopt by regulation variances recommended by the department pursuant to Section 10609.14 and guidelines and methodologies pertaining to the calculation of an urban retail water supplier's urban water use objective recommended by the department pursuant to Section 10609.16.

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.4.** (a) (1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily.

(2) Beginning January 1, 2025, and until January 1, 2030, the standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(b) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and may jointly recommend to the Legislature a standard for indoor residential water use that more appropriately reflects best practices for indoor residential water use than the standard described in subdivision (a). A report on the results of the studies and investigations shall be made to the chairpersons of the relevant policy committees of each house of the Legislature by January 1, 2021, and shall include information necessary to support the recommended standard, if there is one. The studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater

management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.

(2) The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.6.** (a) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor residential use for adoption by the board in accordance with this chapter.

(2) (A) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(B) The standards shall apply to irrigable lands.

(C) The standards shall include provisions for swimming pools, spas, and other water features. Ornamental water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, shall be analyzed separately from swimming pools and spas.

(b) The department shall, by January 1, 2021, provide each urban retail water supplier with data regarding the area of residential irrigable lands in a manner that can reasonably be applied to the standards adopted pursuant to this section.

(c) The department shall not recommend standards pursuant to this section until it has conducted pilot projects or studies, or some combination of the two, to ensure that the data provided to local agencies are reasonably accurate for the data's intended uses, taking into consideration California's diverse landscapes and community characteristics.

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.8.** (a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor irrigation of landscape areas with dedicated irrigation meters or other means of calculating outdoor irrigation use in connection with CII water use for adoption by the board in accordance with this chapter.

(b) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(c) The standards shall include an exclusion for water for commercial agricultural use meeting the definition of subdivision (b) of Section 51201 of the Government Code.

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.9.** For purposes of Sections 10609.6 and 10609.8, "principles of the model water efficient landscape ordinance" means those provisions of the model water efficient landscape ordinance applicable to the establishment or determination of the amount of water necessary to efficiently irrigate both new and existing landscapes. These provisions include, but are not limited to, all of the following:

(a) Evapotranspiration adjustment factors, as applicable.

(b) Landscape area.

(c) Maximum applied water allowance.

(d) Reference evapotranspiration.

(e) Special landscape areas, including provisions governing evapotranspiration adjustment factors for different types of water used for irrigating the landscape.

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.10.** (a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, performance measures for CII water use for adoption by the board in accordance with this chapter.

(b) Prior to recommending performance measures for CII water use, the department shall solicit broad public participation from stakeholders and other interested persons relating to all of the following:

- (1) Recommendations for a CII water use classification system for California that address significant uses of water.
- (2) Recommendations for setting minimum size thresholds for converting mixed CII meters to dedicated irrigation meters, and evaluation of, and recommendations for, technologies that could be used in lieu of requiring dedicated irrigation meters.
- (3) Recommendations for CII water use best management practices, which may include, but are not limited to, water audits and water management plans for those CII customers that exceed a recommended size, volume of water use, or other threshold.

(c) Recommendations of appropriate performance measures for CII water use shall be consistent with the October 21, 2013, report to the Legislature by the Commercial, Industrial, and Institutional Task Force entitled "Water Use Best Management Practices," including the technical and financial feasibility recommendations provided in that report, and shall support the economic productivity of California's commercial, industrial, and institutional sectors.

(d) (1) The board, in coordination with the department, shall adopt performance measures for CII water use on or before June 30, 2022.

(2) Each urban retail water supplier shall implement the performance measures adopted by the board pursuant to paragraph (1).

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.12.** The standards for water loss for urban retail water suppliers shall be the standards adopted by the board pursuant to subdivision (i) of Section 10608.34.

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.14.** (a) The department, in coordination with the board, shall conduct necessary studies and investigations and, no later than October 1, 2021, recommend for adoption by the board in accordance with this chapter appropriate variances for unique uses that can have a material effect on an urban retail water supplier's urban water use objective.

(b) Appropriate variances may include, but are not limited to, allowances for the following:

- (1) Significant use of evaporative coolers.
- (2) Significant populations of horses and other livestock.
- (3) Significant fluctuations in seasonal populations.
- (4) Significant landscaped areas irrigated with recycled water having high levels of total dissolved solids.
- (5) Significant use of water for soil compaction and dust control.
- (6) Significant use of water to supplement ponds and lakes to sustain wildlife.
- (7) Significant use of water to irrigate vegetation for fire protection.
- (8) Significant use of water for commercial or noncommercial agricultural use.

(c) The department, in recommending variances for adoption by the board, shall also recommend a threshold of significance for each recommended variance.

(d) Before including any specific variance in calculating an urban retail water supplier's water use objective, the urban retail water supplier shall request and receive approval by the board for the inclusion of that variance.

(e) The board shall post on its Internet Web site all of the following:

- (1) A list of all urban retail water suppliers with approved variances.
- (2) The specific variance or variances approved for each urban retail water supplier.
- (3) The data supporting approval of each variance.

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.15.** To help streamline water data reporting, the department and the board shall do all of the following:

(a) Identify urban water reporting requirements shared by both agencies, and post on each agency's Internet Web site how the data is used for planning, regulatory, or other purposes.

(b) Analyze opportunities for more efficient publication of urban water reporting requirements within each agency, and analyze how each agency can integrate various data sets in a publicly accessible location, identify priority actions, and implement priority actions identified in the analysis.

(c) Make appropriate data pertaining to the urban water reporting requirements that are collected by either agency available to the public according to the principles and requirements of the Open and Transparent Water Data Act (Part 4.9 (commencing with Section 12400)).

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.16.** The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, guidelines and methodologies for the board to adopt that identify how an urban retail water supplier calculates its urban water use objective. The guidelines and methodologies shall address, as necessary, all of the following:

(a) Determining the irrigable lands within the urban retail water supplier's service area.

(b) Updating and revising methodologies described pursuant to subparagraph (A) of paragraph (1) of subdivision (h) of Section 10608.20, as appropriate, including methodologies for calculating the population in an urban retail water supplier's service area.

(c) Using landscape area data provided by the department or alternative data.

(d) Incorporating precipitation data and climate data into estimates of a urban retail water supplier's outdoor irrigation budget for its urban water use objective.

(e) Estimating changes in outdoor landscape area and population, and calculating the urban water use objective, for years when updated landscape imagery is not available from the department.

(f) Determining acceptable levels of accuracy for the supporting data, the urban water use objective, and compliance with the urban water use objective.

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.18.** The department and the board shall solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter. The board shall hold at least one public meeting before taking any action on any standard or variance recommended by the department.

*(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)*

**10609.20.** (a) Each urban retail water supplier shall calculate its urban water use objective no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use conditions for the previous calendar or fiscal year.

(c) Each urban water supplier's urban water use objective shall be composed of the sum of the following:

(1) Aggregate estimated efficient indoor residential water use.

(2) Aggregate estimated efficient outdoor residential water use.

(3) Aggregate estimated efficient outdoor irrigation of landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use.

(4) Aggregate estimated efficient water losses.

(5) Aggregate estimated water use in accordance with variances, as appropriate.

(d) (1) An urban retail water supplier that delivers water from a groundwater basin, reservoir, or other source that is augmented by potable reuse water may adjust its urban water use objective by a bonus incentive calculated pursuant to this subdivision.

(2) The water use objective bonus incentive shall be the volume of its potable reuse delivered to residential water users and to landscape areas with dedicated irrigation meters in connection with CII water use, on an acre-foot basis.

(3) The bonus incentive pursuant to paragraph (1) shall be limited in accordance with one of the following:

(A) The bonus incentive shall not exceed 15 percent of the urban water supplier's water use objective for any potable reuse water produced at an existing facility.

(B) The bonus incentive shall not exceed 10 percent of the urban water supplier's water use objective for any potable reuse water produced at any facility that is not an existing facility.

(4) For purposes of this subdivision, "existing facility" means a facility that meets all of the following:

(A) The facility has a certified environmental impact report, mitigated negative declaration, or negative declaration on or before January 1, 2019.

(B) The facility begins producing and delivering potable reuse water on or before January 1, 2022.

(C) The facility uses microfiltration and reverse osmosis technologies to produce the potable reuse water.

(e) (1) The calculation of the urban water use objective shall be made using landscape area and other data provided by the department and pursuant to the standards, guidelines, and methodologies adopted by the board. The department shall provide data to the urban water supplier at a level of detail sufficient to allow the urban water supplier to verify its accuracy at the parcel level.

(2) Notwithstanding paragraph (1), an urban retail water supplier may use alternative data in calculating the urban water use objective if the supplier demonstrates to the department that the alternative data are equivalent, or superior, in quality and accuracy to the data provided by the department. The department may provide technical assistance to an urban retail water supplier in evaluating whether the alternative data are appropriate for use in calculating the supplier's urban water use objective.

*(Amended by Stats. 2019, Ch. 239, Sec. 2. (AB 1414) Effective January 1, 2020.)*

**10609.21.** (a) For purposes of Section 10609.20, and notwithstanding paragraph (4) of subdivision (d) of Section 10609.20, "existing facility" also includes the North City Project, phase one of the Pure Water San Diego Program, for which an environmental impact report was certified on April 10, 2018.

(b) This section shall become operative on January 1, 2019.

*(Added by Stats. 2018, Ch. 453, Sec. 4. (SB 875) Effective September 17, 2018. Section operative January 1, 2019, by its own provisions.)*

**10609.22.** (a) An urban retail water supplier shall calculate its actual urban water use no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use for the previous calendar or fiscal year.

(c) Each urban water supplier's urban water use shall be composed of the sum of the following:

(1) Aggregate residential water use.

(2) Aggregate outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.

(3) Aggregate water losses.

*(Amended by Stats. 2019, Ch. 239, Sec. 3. (AB 1414) Effective January 1, 2020.)*

**10609.24.** (a) An urban retail water supplier shall submit a report to the department no later than January 1, 2024, and by January 1 every year thereafter. The report shall include all of the following:

(1) The urban water use objective calculated pursuant to Section 10609.20 along with relevant supporting data.

(2) The actual urban water use calculated pursuant to Section 10609.22 along with relevant supporting data.

(3) Documentation of the implementation of the performance measures for CII water use.

(4) A description of the progress made towards meeting the urban water use objective.

(5) The validated water loss audit report conducted pursuant to Section 10608.34.

(b) The department shall post the reports and information on its internet website.

(c) The board may issue an information order or conservation order to, or impose civil liability on, an entity or individual for failure to submit a report required by this section.

*(Amended by Stats. 2019, Ch. 239, Sec. 4. (AB 1414) Effective January 1, 2020.)*

**10609.25.** As part of the first report submitted to the department by an urban retail water supplier no later than January 1, 2024, pursuant to subdivision (a) of Section 10609.24, each urban retail water supplier shall provide a

narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027.

*(Added by Stats. 2019, Ch. 239, Sec. 5. (AB 1414) Effective January 1, 2020.)*

**10609.26.** (a) (1) On and after January 1, 2024, the board may issue informational orders pertaining to water production, water use, and water conservation to an urban retail water supplier that does not meet its urban water use objective required by this chapter. Informational orders are intended to obtain information on supplier activities, water production, and conservation efforts in order to identify technical assistance needs and assist urban water suppliers in meeting their urban water use objectives.

(2) In determining whether to issue an informational order, the board shall consider the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet the urban water use objective.

(3) The board shall share information received pursuant to this subdivision with the department.

(4) An urban water supplier may request technical assistance from the department. The technical assistance may, to the extent available, include guidance documents, tools, and data.

(b) On and after January 1, 2025, the board may issue a written notice to an urban retail water supplier that does not meet its urban water use objective required by this chapter. The written notice may warn the urban retail water supplier that it is not meeting its urban water use objective described in Section 10609.20 and is not making adequate progress in meeting the urban water use objective, and may request that the urban retail water supplier address areas of concern in its next annual report required by Section 10609.24. In deciding whether to issue a written notice, the board may consider whether the urban retail water supplier has received an informational order, the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet its urban water use objective.

(c) (1) On and after January 1, 2026, the board may issue a conservation order to an urban retail water supplier that does not meet its urban water use objective. A conservation order may consist of, but is not limited to, referral to the department for technical assistance, requirements for education and outreach, requirements for local enforcement, and other efforts to assist urban retail water suppliers in meeting their urban water use objective.

(2) In issuing a conservation order, the board shall identify specific deficiencies in an urban retail water supplier's progress towards meeting its urban water use objective, and identify specific actions to address the deficiencies.

(3) The board may request that the department provide an urban retail water supplier with technical assistance to support the urban retail water supplier's actions to remedy the deficiencies.

(d) A conservation order issued in accordance with this chapter may include requiring actions intended to increase water-use efficiency, but shall not curtail or otherwise limit the exercise of a water right, nor shall it require the imposition of civil liability pursuant to Section 377.

*(Amended by Stats. 2019, Ch. 239, Sec. 6. (AB 1414) Effective January 1, 2020.)*

**10609.27.** Notwithstanding Section 10609.26, the board shall not issue an information order, written notice, or conservation order pursuant to Section 10609.26 if both of the following conditions are met:

(a) The board determines that the urban retail water supplier is not meeting its urban water use objective solely because the volume of water loss exceeds the urban retail water supplier's standard for water loss.

(b) Pursuant to Section 10608.34, the board is taking enforcement action against the urban retail water supplier for not meeting the performance standards for the volume of water losses.

*(Added by Stats. 2019, Ch. 203, Sec. 1. (SB 134) Effective January 1, 2020.)*

**10609.28.** The board may issue a regulation or informational order requiring a wholesale water supplier, an urban retail water supplier, or a distributor of a public water supply, as that term is used in Section 350, to provide a monthly report relating to water production, water use, or water conservation.

*(Added by Stats. 2018, Ch. 14, Sec. 12. (SB 606) Effective January 1, 2019.)*

**10609.30.** On or before January 10, 2024, the Legislative Analyst shall provide to the appropriate policy committees of both houses of the Legislature and the public a report evaluating the implementation of the water use efficiency

standards and water use reporting pursuant to this chapter. The board and the department shall provide the Legislative Analyst with the available data to complete this report.

(a) The report shall describe all of the following:

(1) The rate at which urban retail water users are complying with the standards, and factors that might facilitate or impede their compliance.

(2) The accuracy of the data and estimates being used to calculate urban water use objectives.

(3) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.

(4) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.

(5) The early indications of how implementing this chapter might impact the efficiency of statewide urban water use.

(6) Recommendations, if any, for improving statewide urban water use efficiency and the standards and practices described in this chapter.

(7) Any other issues the Legislative Analyst deems appropriate.

*(Added by Stats. 2018, Ch. 14, Sec. 13. (SB 606) Effective January 1, 2019.)*

**10609.32.** It is the intent of the Legislature that the chairperson of the board and the director of the department appear before the appropriate policy committees of both houses of the Legislature on or around January 1, 2026, and report on the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. It is the intent of the Legislature that the topics to be covered include all of the following:

(a) The rate at which urban retail water suppliers are complying with the standards, and factors that might facilitate or impede their compliance.

(b) What enforcement actions have been taken, if any.

(c) The accuracy of the data and estimates being used to calculate urban water use objectives.

(d) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.

(e) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.

(f) An assessment of how implementing this chapter is affecting the efficiency of statewide urban water use.

*(Added by Stats. 2018, Ch. 14, Sec. 14. (SB 606) Effective January 1, 2019.)*

**10609.34.** Notwithstanding Section 15300.2 of Title 14 of the California Code of Regulations, an action of the board taken under this chapter shall be deemed to be a Class 8 action, within the meaning of Section 15308 of Title 14 of the California Code of Regulations, provided that the action does not involve relaxation of existing water conservation or water use standards.

*(Added by Stats. 2018, Ch. 14, Sec. 15. (SB 606) Effective January 1, 2019.)*

**10609.36.** (a) Nothing in this chapter shall be construed to determine or alter water rights. Sections 1010 and 1011 apply to water conserved through implementation of this chapter.

(b) Nothing in this chapter shall be construed to authorize the board to update or revise water use efficiency standards authorized by this chapter except as explicitly provided in this chapter. Authorization to update the standards beyond that explicitly provided in this chapter shall require separate legislation.

(c) Nothing in this chapter shall be construed to limit or otherwise affect the use of recycled water as seawater barriers for groundwater salinity management.

*(Added by Stats. 2018, Ch. 14, Sec. 16. (SB 606) Effective January 1, 2019.)*

**10609.38.** The board may waive the requirements of this chapter for a period of up to five years for any urban retail water supplier whose water deliveries are significantly affected by changes in water use as a result of damage from a disaster such as an earthquake or fire. In establishing the period of a waiver, the board shall take into

consideration the breadth of the damage and the time necessary for the damaged areas to recover from the disaster.

*(Added by Stats. 2018, Ch. 14, Sec. 17. (SB 606) Effective January 1, 2019.)*





DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999]  
(Heading of Division 6 amended by Stats. 1957, Ch. 1932. )

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 - 10657] ( Part 2.6 added by Stats. 1983, Ch. 1009, Sec.. )

**CHAPTER 1. General Declaration and Policy [10610 - 10610.4] ( Chapter 1 added by Stats. 1983, Ch. 1009, Alec. 1. )**

[10610](#) This part shall be known and may be cited as the “Urban Water Management Planning Act.”

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

[10610.2.](#) (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

(Amended by Stats. 201B, Ch. 14, Sec. 18. (SB 606) Effective January 1, 201 9.)

[10610.4](#) The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.



**CHAPTER 2. Definitions [10611 - 1 0618] ( Chapter 2 added by Stats. 1983, Ch. 1009, iec. 1. )**

[10611.](#) Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

*(Added by Stats. 1983, Ch. 1009, Sec. 1.)*

[10611.3](#) “Customer” means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

*Added by renumbering Section 10612 by Stats. 2018, Ch. 14, Sec. 20. (SB 606) Effective January 1, 2019.)*

[10611.5](#) “Demand management” means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

*(Amended by Stats. 1995, Ch. 854, Sec. 3. Effective January 1, 1996.)*

[10612](#) “Drought risk assessment” means a method that examines water shortage risks based on the driest five- year historic sequence for the agency’s water supply, as described in subdivision (b) of Section 10635.

*(Added by Stats. 2018, Ch. 14, Sec. 21. (SB 606) Effective January 1, 2019.)*

[10613.](#) “Efficient use” means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

*(Added by Stats. 1983, Ch. 1009, Exec. 1.)*

[10614.](#) “Person” means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

*(Added by Stats. 1983, Ch. 1009, Sec. 1.)*

[10615.](#) “Plan” means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area’s characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

*(Amended by Stats. 1995, Ch. 854, Sec. 4. Effective January 1, 1996.)*

[10616.](#) “Public agency” means any board, commission, county, city and county, city, regional agency, district, or other public entity.

*(Added by Stats. 1983, Ch. 1009, Sec. 1.)*

[10616.5](#) “Recycled water” means the reclamation and reuse of wastewater for beneficial use.

*(Added by Stats. 1995, Ch. 854, Sec. 5. Effective January 1, 1996)*

[10617.](#) “Urban water supplier” means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water



supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

*(Amended by Stats. 1996, Ch. 1023, Sec. 428. Effective January 29, 1996.)*

[10617.5](#) “Water shortage contingency plan” means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.

*(Added by Stats. 2018, Ch. 14, Sec. 22. (SB 606) Effective January 1, 2019)*

[10618](#) “Water supply and demand assessment” means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.

*(Added by Stats. 2018, Ch. 14, Sec. 23 (SB 606). Effective January 1, 2019)*



**CHAPTER 3. Urban Water Management Plans [10620 - 10645] ( Chapter 3 added by Stabs. 1983, Ch. 1009, Sec. 1. )**

**ARTICLE 1. General Provisions [10620 - 10621] ( Article 1 added by Stats. 1983, Ch. 1009, Sec. 1. )**

- [10620.](#) (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).
- (b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.
- (c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.
- (d) (l) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation, efficient water use, and improved local drought resilience.
- (2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.
- (3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.
- (e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.
- (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.
- (Amended by Stats. 2018, Ch. 14, Sec. 24. (SB 606) Effective January 1, 2019.)*

- [10621](#) (a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.
- (b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.
- (c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.
- (d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640)
- (e) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016



(f) Each urban water supplier shall update and submit its 2020 plan to the department by July 1,2021

*(Amended by Stats. 2019, Ch. 239, Sec. 7. (AB 1414) Effective January 1, 2020.)*



**CHAPTER 3. Urban Water Management Plans [10620 - 10645] ( Chapter 3 added by Stats. 1983, Ch. 1009, Sec. 1. )**

**ARTICLE 2. Contents of Plans [10630 - 10634] ( Article 2 added by Stats. 1983, Ch. 1009, Sec. 1. )**

**10630** It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.

*(Amended by Stats. 2018, Ch. 14, Sec. 26. (SB 606) Effective January 1, 2019.)*

**10630.5** Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

*(Added by Stats. 2018, Ch. 14, Sec. 27. (SB 606) Effective January 1, 2019.)*

**10631** A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

(3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.



(A) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(B) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(C) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(d) (I) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) (A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

(4) (A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use



plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) For the supplement required of urban retail water suppliers by paragraph (2) of subdivision (f) of Section 10621, a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027, pursuant to Chapter 9 (commencing with Section 10609) of Part 2.55.

(C) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (C) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.





(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

*(Amended by Stats. 2018, Ch. 14, Sec. 28. (SB 606) Effective January 1, 2019.)*

[10631.1](#) (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

*(Added by Stats. 2005, Ch. 727, Sec. 2. Effective January 1, 2006.)*

[10631.2](#). (a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:

- (1) An estimate of the amount of energy used to extract or divert water supplies.
- (2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
- (3) An estimate of the amount of energy used to treat water supplies.
- (4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
- (5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
- (6) An estimate of the amount of energy used to place water into or withdraw from storage.
- (7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

*(Amended by Stats. 2018, Ch. 14, Sec. 29. (SB 606a) Effective January 1, 2019.)*

[10632](#) (a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:

- (1) The analysis of water supply reliability conducted pursuant to Section 10635.
- (2) The procedures used in conducting an annual water supply and demand assessment



that include, at a minimum, both of the following:

(A) The written decision making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

(3) (A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions. Locally appropriate demand reduction actions to adequately respond to shortages.

(B) Locally appropriate operational changes.

(C) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(D) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption



procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

(7) (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

*(Repealed and added by Stats. 2018, Ch. 14, Sec. 32. (SB 606) Effective January 1, 2019.)*

[10632.1](#) An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before June 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by June 1 of each year, whichever is later.

*(Added by Stats. 2018, Ch. 14, Sec. 33. (SB 606) Effective January 1, 2019.)*

[10632.2](#) An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision

(a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section



10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

*(Added by Stats. 2018, Ch. 14, Sec. 34. (SB 606) Effective January 1, 2019.)*

[10632.3](#) It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

*(Added by Stats. 2018, Ch. 14, Sec. 35. (SB 606) Effective January 1, 2019.)*

[10632.5](#) (a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

*(Added by Stats. 2015, Ch. 681, Sec. 1. (SB 664a Effective January 1, 2016.)*

[10633](#) The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.



*(Amended by Stats. 2009, Ch. 534, Sec. 2. (AB 1465) Effective January 1, 2010.)*

[10634](#) The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

*(Added by Stats. 2001, Ch. 644, Sec. 3. Effective January 1, 2002.)*



**CHAPTER 3. Urban Water Management Plans [10620 - 10645] ( Chapter 3 added by Stabs. 1983, Ch. 1009, Sec. 1. )**

**ARTICLE 2.5. Water Service Reliability [10635- 10635.] ( Article 2.5 added by Stats. 1995, Ch. 854, Sec. 11. )**

[10635.](#) (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

- (1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.
- (2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.
- (3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.
- (4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

(c) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(d) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(e) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers

*(Amended by Stats. 2018, Ch. 14, Sec. 36. (SB 606) Effective January 1, 2019.)*



**CHAPTER 3. Urban Water Management Plans [10620 - 10645] ( Chapter 3 added by Stabs. 1983, Ch. 1009, Sec. 1. )**

**ARTICLE 3. Adoption and Implementation of Plans [1 0640 - 10645] Article 3 added by Stats. 1983, Ch. 1009, Sec. 1.)**

[10640.](#) (a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

*(Amended by Stats. 2018, Ch. 14, Sec. 37. (SB 606a Effective January 1, 20J 9.g*

[10641](#) An urban water supplier required to prepare a plan or a water shortage contingency plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

*(Amended by Stats. 2018, Ch. 14, Sec. 38. (SB 606a Effective January 1, 20J 9.g*

[10642.](#) Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

*(Amended by Stats. 2018, Ch. 14, Sec. 39. (SB 606\$ Effective January 1, 70J 9.g*

[10643](#) An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

*(Added by Stats. 1983, Ch. 1009, Sec. 1.)*

[10644](#) (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1)



shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

(c) (1) (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before July 1, in the years ending in seven and two, a report summarizing the status of the plans and water shortage contingency plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans and water shortage contingency plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan and water shortage contingency plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans and water shortage contingency plans submitted pursuant to this part.

(B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.

(C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.

(2) A report to be submitted pursuant to subparagraph (A) of paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(d) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

*(Amended by Stats. 2018, Ch. 14, Sec. 40. (SB 606) Effective January 1, 2019.)*

[10645.](#) (a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

*(Amended by Stats. 2018, Ch. 14, Sec. 41. (SB 606) Effective January 1, 2019.)*





**CHAPTER 4. Miscellaneous Provisions [1 0650 - 10657] ( Chapter 4 added by :itats. 1 983, Ch. 1009, iec. 1. )**

[10650](#) Any actions or proceedings, other than actions by the board, to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan or a water shortage contingency plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan or water shortage contingency plan, or action taken pursuant to either, does not comply with this part shall be commenced within 90 days after filing of the plan or water shortage contingency plan or an amendment to either pursuant to Section 10644 or the taking of that action.

*(Amended by Stats. 2018, Ch. 14, Sec. 42. (SB 606) Effective January 1, 2019.)*

[10651](#) In any action or proceeding to attack, review, set aside, void, or annul a plan or a water shortage contingency plan, or an action taken pursuant to either by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

*(Amended by Stats. 2018, Ch. 14, Sec. 43. (SB 606) Effective January 1, 2019)*

[10652](#) The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

*(Amended by Stats. 1995, Ch. 854, Sec. 6. Effective January 1, 1996.)*

[10653](#) The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the board and the Public Utilities Commission, for the preparation of water management plans, water shortage contingency plans, or conservation plans; provided, that if the board or the Public Utilities Commission requires additional information concerning water conservation, drought response measures, or financial conditions to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan that complies with analogous federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

*(Amended by Stats. 2018, Ch. 14, Sec. 45. (SB 606) Effective January 1, 2019)*

[10654](#) An urban water supplier may recover in its rates the costs incurred in preparing its urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency plan and implementing the reasonable water conservation measures included in either of the plans.

*(Amended by Stats. 2018, Ch. 14, Sec. 44. (SB 606) Effective January 1, 2019)*

[10655](#) If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.



*(Amended by Stats. 1983, Ch. 1009, Sec. 1)*

[10656](#) An urban water supplier is not eligible for a water grant or loan awarded or administered by the state unless the urban water supplier complies with this part.

*(Amended by Stats. 2018, Ch. 14, Sec. 46. (SB 606) Effective January 1, 2019)*

[10657](#) The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement this part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.

*(Amended by Stats. 2018, Ch. 14, Sec. 47. (SB 606) Effective January 1, 2019)*

**APPENDIX B**  
**NOTICE OF PLAN PREPARATION**

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Fire Department - 209 / 962-7891  
www.gcsd.org

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August 5, 2021

Pine Mountain Lake Association  
Joe Powell  
General Manager  
19228 Pine Mountain Drive  
Groveland, CA 95321

**Subject: 2020 Urban Water Management Plan Update**

Dear Mr. Powell,

Existing State law requires each urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) at least once every 5 years. The Groveland Community Services District (GCSGD) is currently preparing an update to its 2015 UWMP in compliance with the 2020 UWMP Guidebook. The UWMP documents the GCSGD's plans to ensure adequate water supplies to meet existing and future demands for water under a range of water supply conditions.

In conformance with California Water Code Section 10621(b), the GCSGD is notifying the County within which the GCSGD provides water supplies that UWMP is being renewed and updated. We invite your participation in this process. A draft plan will be made available for public review within the next month. Public hearings will be scheduled sixty (60) days before adoption of the 2020 UWMP by the Board of Directors.

Please contact me if you have any questions or would like more information regarding the GCSGD's 2020 UWMP update.

Sincerely,

A handwritten signature in blue ink, appearing to read "L. Melchor", with a long horizontal flourish extending to the right.

Luis Melchor  
Operations Manager  
Groveland Community Services District  
18966 Ferretti Road  
Groveland, CA 95321  
Office: (209) 962-7161, ext. 1018  
E-mail: lmelchor@gcsd.org



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August 5, 2021

Turlock Irrigation District  
Michelle Reimers  
General Manager  
333 East Canal Drive  
P.O. Box 949  
Turlock, CA 95381

**Subject: 2020 Urban Water Management Plan Update**

Dear Ms. Reimers,

Existing State law requires each urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) at least once every 5 years. The Groveland Community Services District (GCSD) is currently preparing an update to its 2015 UWMP in compliance with the 2020 UWMP Guidebook. The UWMP documents the GCSD's plans to ensure adequate water supplies to meet existing and future demands for water under a range of water supply conditions.

In conformance with California Water Code Section 10621(b), the GCSD is notifying agencies in the area that the GCSD's UWMP is being renewed and updated. We invite your participation in this process. A draft plan will be made available for public review within the next month. Public hearings will be scheduled sixty (60) days before adoption of the 2020 UWMP by the Board of Directors.

Please contact me if you have any questions or would like more information regarding the GCSD's 2020 UWMP update.

Sincerely,

A handwritten signature in blue ink, appearing to read 'L Melchor', with a long horizontal flourish extending to the right.

Luis Melchor  
Operations Manager  
Groveland Community Services District  
18966 Ferretti Road  
Groveland, CA 95321  
Office: (209) 962-7161, ext. 1018  
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August 5, 2021

County of Tuolumne  
Quincy Yaley  
Community Development Department Director  
2 S. Green Street  
Sonora, CA 95370

**Subject: 2020 Urban Water Management Plan Update**

Dear Ms. Yaley,

Existing State law requires each urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) at least once every 5 years. The Groveland Community Services District (GCSGD) is currently preparing an update to its 2015 UWMP in compliance with the 2020 UWMP Guidebook. The UWMP documents the GCSGD's plans to ensure adequate water supplies to meet existing and future demands for water under a range of water supply conditions.

In conformance with California Water Code Section 10621(b), the GCSGD is notifying the County within which the GCSGD provides water supplies that UWMP is being renewed and updated. We invite your participation in this process. A draft plan will be made available for public review within the next month. Public hearings will be scheduled sixty (60) days before adoption of the 2020 UWMP by the Board of Directors.

Please contact me if you have any questions or would like more information regarding the GCSGD's 2020 UWMP update.

Sincerely,

A handwritten signature in blue ink, appearing to read "Luis Melchor", with a long horizontal flourish extending to the right.

Luis Melchor  
Operations Manager  
Groveland Community Services District  
18966 Ferretti Road  
Groveland, CA 95321  
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August 5, 2021

San Francisco Public Utilities Commission  
Michael Carlin  
General Manager  
525 Golden Gate Ave  
San Francisco, CA 94102

**Subject: 2020 Urban Water Management Plan Update**

Dear Mr. Carlin,

Existing State law requires each urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) at least once every 5 years. The Groveland Community Services District (GCSGD) is currently preparing an update to its 2015 UWMP in compliance with the 2020 UWMP Guidebook. The UWMP documents the GCSGD's plans to ensure adequate water supplies to meet existing and future demands for water under a range of water supply conditions.

In conformance with California Water Code Section 10621(b), the GCSGD is notifying agencies and cities in the area that the GCSGD's UWMP is being renewed and updated. We invite your participation in this process. A draft plan will be made available for public review within the next month. Public hearings will be scheduled sixty (60) days before adoption of the 2020 UWMP by the Board of Directors.

Please contact me if you have any questions or would like more information regarding the GCSGD's 2020 UWMP update.

Sincerely,

A handwritten signature in blue ink, appearing to read "L. Melchor", with a long horizontal flourish extending to the right.

Luis Melchor  
Operations Manager  
Groveland Community Services District  
18966 Ferretti Road  
Groveland, CA 95321  
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August 5, 2021

City of Sonora  
Rachel Kellogg  
Community Development Director  
94 N. Washington Street  
Sonora, CA 95370

**Subject: 2020 Urban Water Management Plan Update**

Dear Ms. Kellogg,

Existing State law requires each urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) at least once every 5 years. The Groveland Community Services District (GCSD) is currently preparing an update to its 2015 UWMP in compliance with the 2020 UWMP Guidebook. The UWMP documents the GCSD's plans to ensure adequate water supplies to meet existing and future demands for water under a range of water supply conditions.

In conformance with California Water Code Section 10621(b), the GCSD is notifying agencies and cities in the area that the GCSD's UWMP is being renewed and updated. We invite your participation in this process. A draft plan will be made available for public review within the next month. Public hearings will be scheduled sixty (60) days before adoption of the 2020 UWMP by the Board of Directors.

Please contact me if you have any questions or would like more information regarding the GCSD's 2020 UWMP update.

Sincerely,

A handwritten signature in blue ink, appearing to read "L. Melchor", with a long horizontal flourish extending to the right.

Luis Melchor  
Operations Manager  
Groveland Community Services District  
18966 Ferretti Road  
Groveland, CA 95321  
Office: (209) 962-7161, ext. 1018  
E-mail: [lmelchor@gcsd.org](mailto:lmelchor@gcsd.org)



**APPENDIX C**  
**SERVICE AREA MAP**

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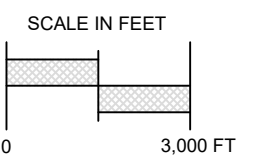
# GROVELAND COMMUNITY SERVICE DISTRICT

2020 URBAN WATER MANAGEMENT PLAN



## LEGEND

 GCSD SERVICE AREA BOUNDARY



GCSD SERVICE AREA BOUNDARY

**APPENDIX D**  
**ANNUAL WATER AUDIT REPORTS**

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## CA-NV AWWA Water Loss Technical Assistance Program Wave 4 Water Audit Level 1 Validation Document

### Audit Information:

**Utility:** Groveland Community Services District      **PWS ID:** 5510009  
**System Type:** Potable      **Audit Period:** Calendar 2016  
**Utility Representation:** Angela Costanzo  
**Validation Date:** 8/3/2017      **Call Time:** 9am      **Sufficient Supporting Documents Provided:** Yes

### Validation Findings & Confirmation Statement:

#### Key Audit Metrics:

**Data Validity Score:** 51    **Data Validity Band (Level):** Band III (51-70)  
**ILI:** 0.82      **Real Loss:** 22 (gal/conn/day)      **Apparent Loss:** 1.3 (gal/conn/day)  
**Non-revenue water as percent of cost of operating system:** 3.7%

#### Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit.

### Validator Information:

**Water Audit Validator:** Will Jernigan / Isabel Szendrey (support)    **Validator Qualifications:** Contractor for CA-NV AWWA Water Loss TAP

Validator Provided



## CA-NV AWWA Water Loss Technical Assistance Program Wave 4 Water Audit Level 1 Validation Document

Water System Name: Groveland Community Services District    Water System ID Number: 5510009    Water Audit Period: Calendar 2016

### Water Audit & Water Loss Improvement Steps:

Steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

Confirmed testing and calibration frequency of imported water. Confirmed frequency of meter reads and how frequent data is reviewed by GCSD staff.

### Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Utility Provided

Executive Name Jon Sterling

Executive Position General Manager

Signature

9/21/17

Date

# AWWA Free Water Audit Software v5.0

American Water Works Association Copyright © 2014, All Rights Reserved.

This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

## Please begin by providing the following information

Name of Contact Person:

Email Address:

Telephone | Ext.:

Name of City / Utility:

City/Town/Municipality:

State / Province:

Country:

Year:

Audit Preparation Date:

Volume Reporting Units:

PWSID / Other ID:

## The following guidance will help you complete the Audit

All audit data are entered on the [Reporting Worksheet](#)

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt:   Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

<p><b><u>Instructions</u></b></p> <p>The current sheet. Enter contact information and basic audit details (year, units etc)</p>	<p><b><u>Reporting Worksheet</u></b></p> <p>Enter the required data on this worksheet to calculate the water balance and data grading</p>	<p><b><u>Comments</u></b></p> <p>Enter comments to explain how values were calculated or to document data sources</p>	<p><b><u>Performance Indicators</u></b></p> <p>Review the performance indicators to evaluate the results of the audit</p>	<p><b><u>Water Balance</u></b></p> <p>The values entered in the Reporting Worksheet are used to populate the Water Balance</p>	<p><b><u>Dashboard</u></b></p> <p>A graphical summary of the water balance and Non-Revenue Water components</p>
<p><b><u>Grading Matrix</u></b></p> <p>Presents the possible grading options for each input component of the audit</p>	<p><b><u>Service Connection Diagram</u></b></p> <p>Diagrams depicting possible customer service connection line configurations</p>	<p><b><u>Definitions</u></b></p> <p>Use this sheet to understand the terms used in the audit process</p>	<p><b><u>Loss Control Planning</u></b></p> <p>Use this sheet to interpret the results of the audit validity score and performance indicators</p>	<p><b><u>Example Audits</u></b></p> <p>Reporting Worksheet and Performance Indicators examples are shown for two validated audits</p>	<p><b><u>Acknowledgements</u></b></p> <p>Acknowledgements for the AWWA Free Water Audit Software v5.0</p>

If you have questions or comments regarding the software please contact us via email at: [wlc@awwa.org](mailto:wlc@awwa.org)



# AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

American Water Works Association

? Click to access definition  
+ Click to add a comment

**Water Audit Report for:** Groveland Community Services District (CA5510009)  
**Reporting Year:** 2016    1/2016 - 12/2016

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

**All volumes to be entered as: MILLION GALLONS (US) PER YEAR**

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

**WATER SUPPLIED**

<----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+	?	n/a	0.000	MG/Yr
Water imported:	+	?	3	125.450	MG/Yr
Water exported:	+	?	n/a	0.000	MG/Yr

**Master Meter and Supply Error Adjustments**

Pcmt:	Value:	MG/Yr
+	?	1
+	?	1
+	?	1

**WATER SUPPLIED:** 125.450 MG/Yr

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

**AUTHORIZED CONSUMPTION**

Billed metered:	+	?	5	94.834	MG/Yr
Billed unmetered:	+	?	n/a	0.000	MG/Yr
Unbilled metered:	+	?	n/a	0.000	MG/Yr
Unbilled unmetered:	+	?	7	3.000	MG/Yr

Unbilled Unmetered volume entered is greater than the recommended default value

**AUTHORIZED CONSUMPTION:** 97.834 MG/Yr

Click here: ? for help using option buttons below

Pcmt: Value: MG/Yr

Use buttons to select percentage of water supplied OR value

**WATER LOSSES (Water Supplied - Authorized Consumption)**

27.616 MG/Yr

**Apparent Losses**

Unauthorized consumption: 0.314 MG/Yr  
 Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+	?	3	0.958	MG/Yr
Systematic data handling errors:	+	?		0.237	MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

**Apparent Losses:** 1.509 MG/Yr

Pcmt: Value: MG/Yr

0.25% 1.00% 0.25%

**Real Losses (Current Annual Real Losses or CARL)**

Real Losses = Water Losses - Apparent Losses: 26.107 MG/Yr

**WATER LOSSES:** 27.616 MG/Yr

**NON-REVENUE WATER**

**NON-REVENUE WATER:** 30.616 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

**SYSTEM DATA**

Length of mains:	+	?	3	71.0	miles
Number of active AND inactive service connections:	+	?	8	3,258	
Service connection density:	?			46	conn./mile main

Are customer meters typically located at the curbside or property line? Yes (length of service line, beyond the property boundary, that is the responsibility of the utility)

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

Average operating pressure: 100.0 psi

**COST DATA**

Total annual cost of operating water system:	+	?	10	\$2,530,704	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	10	\$10.00	\$/1000 gallons (US)
Variable production cost (applied to Real Losses):	+	?	5	\$2,689.96	\$/Million gallons <input type="checkbox"/> Use Customer Retail Unit Cost to value real losses

**WATER AUDIT DATA VALIDITY SCORE:**

\*\*\* YOUR SCORE IS: 51 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: Water imported
- 2: Customer metering inaccuracies
- 3: Billed metered



## AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.

Water Audit Report for: Groveland Community Services District (CA5510009)  
 Reporting Year: 2016 1/2016 - 12/2016

\*\*\* YOUR WATER AUDIT DATA VALIDITY SCORE IS: 51 out of 100 \*\*\*

### System Attributes:

	Apparent Losses:	1.509	MG/Yr
+	Real Losses:	26.107	MG/Yr
=	<b>Water Losses:</b>	<b>27.616</b>	MG/Yr

? Unavoidable Annual Real Losses (UARL): 31.85 MG/Yr

Annual cost of Apparent Losses: \$15,089

Annual cost of Real Losses: \$70,228 Valued at **Variable Production Cost**

Return to Reporting Worksheet to change this assumption

### Performance Indicators:

Financial:	{	Non-revenue water as percent by volume of Water Supplied:	24.4%	
		Non-revenue water as percent by cost of operating system:	3.7%	Real Losses valued at Variable Production Cost

Operational Efficiency:	{	Apparent Losses per service connection per day:	1.27	gallons/connection/day
		Real Losses per service connection per day:	21.95	gallons/connection/day
		Real Losses per length of main per day*:	N/A	
		Real Losses per service connection per day per psi pressure:	0.22	gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL): 26.11 million gallons/year

? Infrastructure Leakage Index (ILI) [CARL/UARL]: 0.82

\* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline





## AWWA Free Water Audit Software: User Comments

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Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

<b>General Comment:</b>	
<b>Audit Item</b>	<b>Comment</b>
<a href="#">Volume from own sources:</a>	GCSD purchases water from the San Francisco Public Utilities Commission (SFPUC).
<a href="#">Vol. from own sources: Master meter error adjustment:</a>	Not Applicable
<a href="#">Water imported:</a>	Two raw water connections associated with the Mountain Tunnel (Hetch Hetchy). An alternative emergency water supply with SFPUC also exists but did not occur during the water audit. Each connection splits into two and each have separate meters (a total of 4 production meters). All connections enter the treatment plant that is owned and operated by Groveland.
<a href="#">Water imported: master meter error adjustment:</a>	The District does not have any documentation on SFPUC calibrating the supply meters and the District does not have detailed calibration practices with SFPUC. The District does conduct annual calibrations on their influent flow meters and manually reads/logs meter readings on a daily basis.
<a href="#">Water exported:</a>	No emergency connection exists; therefore it is not possible to export water to another utility.
<a href="#">Water exported: master meter error adjustment:</a>	Not Applicable
<a href="#">Billed metered:</a>	All water billed includes all rate classes (residential, commercial and governmental). The District only performs meter testing when a problem is encountered. When a meter reads 6 consecutive zeros, the meter is manually checked by the District's operators. The District replaces water meters only when a malfunction occurs.
<a href="#">Billed unmetered:</a>	None. All of the District's connections are metered.
<a href="#">Unbilled metered:</a>	No unbilled metered accounts exist.

Audit Item	Comment
<a href="#">Unbilled unmetered:</a>	Approximatly 3,000,000 gallons was used for flusing activities (directional flusing program, auto flushers and tank cleaning).
<a href="#">Unauthorized consumption:</a>	Default grade applied
<a href="#">Customer metering inaccuracies:</a>	Customer meter accuracy testing is only performed on problem meters (customer complaints,suspicipus billing reads, ect.)
<a href="#">Systematic data handling errors:</a>	Default grade applied
<a href="#">Length of mains:</a>	There are 70 miles of water mains within the District's service area.
<a href="#">Number of active AND inactive service connections:</a>	There are a total of 3,258 service connections within the District's service area, this includes both active and inactive connections
<a href="#">Average length of customer service line:</a>	Default input and grade applice, as customer meters are typically located at the property boundary.
<a href="#">Average operating pressure:</a>	100 psi. This value was calcaulted using the pressures recorded during fire flow.
<a href="#">Total annual cost of operating water system:</a>	From GCSD FY 16/17 adopted budget: Total Cost for Administration: \$727,963. Total Cost for Board: 422,832. Total Operations Cost: \$837,131. Total Mainteneance Cost: \$517,318. Total Debt: \$9,350. Total Cost for Capital Projects: \$416,110. Confirmed cost limited to potable water only, with water debt service included. Fequency of internal auditing: annual. Fequency of third-party CPA auditing: annual
<a href="#">Customer retail unit cost (applied to Apparent Losses):</a>	Provided by GCSD FY16/17 adopted budget. Total water revenue inclues total variable revenue (\$867,548), total operating revenue (\$70,319) and total non-operating revenue (\$10,661). Total fixed revenue (\$1,383,919) is not included. Rate sturcture: classes, tiered rates. Input derivation: this value was calcaulted from total water revenues (\$937,867) divided by total billed consumption (99.92MG).
<a href="#">Variable production cost (applied to Real Losses):</a>	Values provided by GCSD FY16/17 adopted budget. Variable production cost includes only primary and scndary cost, fixed cost are not included.



# AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	Groveland Community Services District (CA5510009)	
Reporting Year:	2016	1/2016 - 12/2016
Data Validity Score:	51	

		Water Exported <i>0.000</i>	Billed Water Exported			Revenue Water <b>0.000</b>
Own Sources (Adjusted for known errors)  <i>0.000</i>	System Input  <b>125.450</b>	Water Supplied  <b>125.450</b>	Authorized Consumption  <b>97.834</b>	Billed Authorized Consumption  <b>94.834</b>	Billed Metered Consumption (water exported is removed)  <b>94.834</b>	Revenue Water  <b>94.834</b>
					<b>0.000</b>	
			Unbilled Authorized Consumption  <b>3.000</b>	Unbilled Metered Consumption  <b>0.000</b>	<b>0.000</b>	Non-Revenue Water (NRW)
				<b>3.000</b>		
			Apparent Losses  <b>1.509</b>	Unauthorized Consumption  <b>0.314</b>		<b>30.616</b>
				<b>0.958</b>		
				<b>0.237</b>		
Water Imported  <b>125.450</b>			Water Losses  <b>27.616</b>	Real Losses  <b>26.107</b>	Leakage on Transmission and/or Distribution Mains <i>Not broken down</i>	
					Leakage and Overflows at Utility's Storage Tanks <i>Not broken down</i>	
					Leakage on Service Connections <i>Not broken down</i>	



# AWWA Free Water Audit Software: Dashboard

WAS v5.0

American Water Works Association.

The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

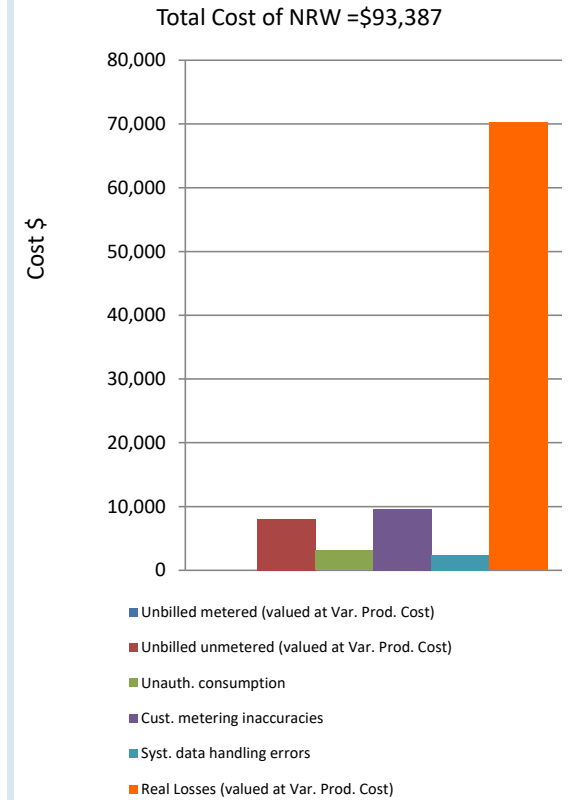
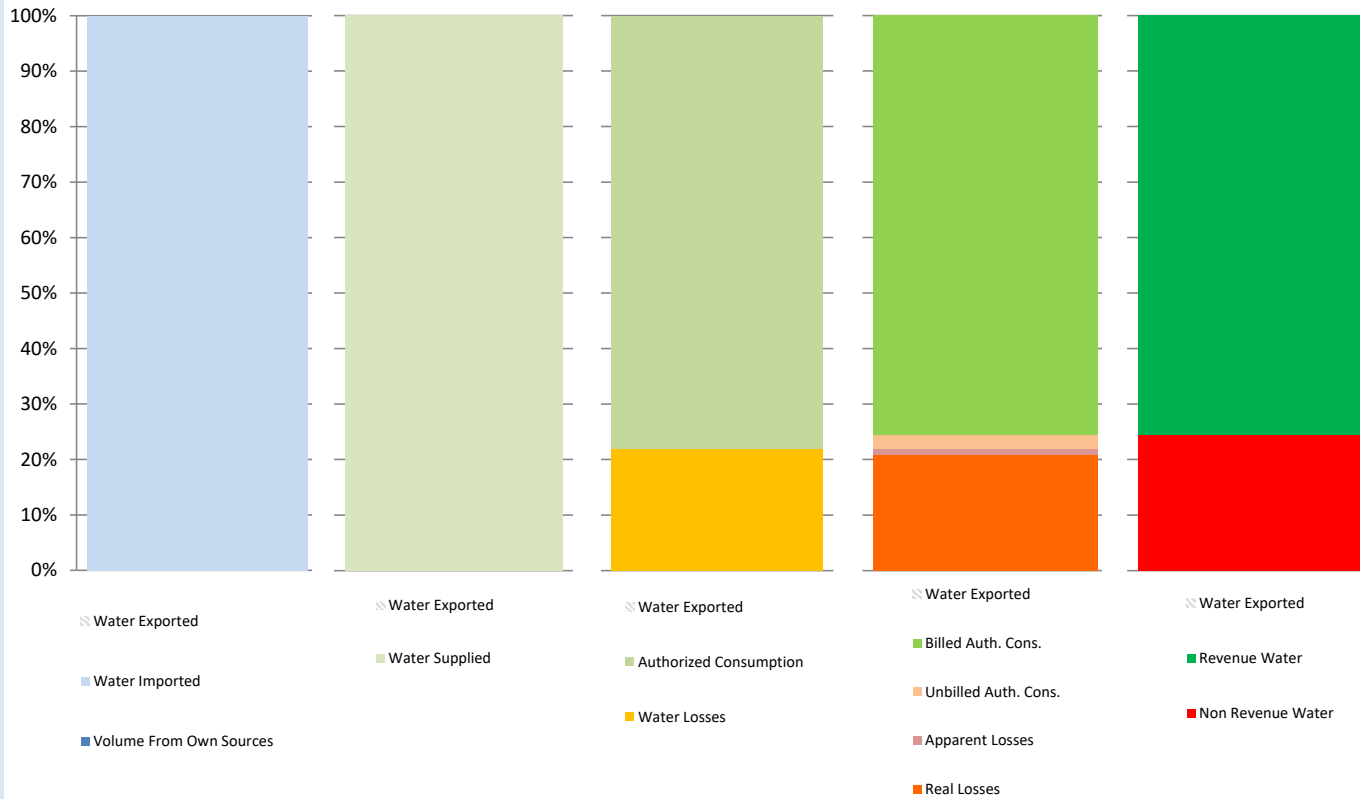
Water Audit Report for: **Groveland Community Services District (CA5510009)**

Reporting Year: **2016**      **1/2016 - 12/2016**

Data Validity Score: **51**

Show me the VOLUME of Non-Revenue Water

Show me the COST of Non-Revenue Water



AWWA Free Water Audit Software: **Grading Matrix**

The grading assigned to each audit component and the corresponding recommended improvements and actions are highlighted in yellow. Audit accuracy is likely to be improved by prioritizing those items shown in red

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
<b>WATER SUPPLIED</b>											
Volume from own sources:	Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.	25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.	Conditions between 2 and 4	50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.	Conditions between 4 and 6	At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Volume from own Sources" component:		<u>to qualify for 2:</u> Organize and launch efforts to collect data for determining volume from own sources	<u>to qualify for 4:</u> Locate all water production sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered water production sources and replace any obsolete/defective meters.		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all source meters; specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/defective meters.		<u>to qualify for 8:</u> Conduct annual meter accuracy testing and calibration of related instrumentation on all meter installations on a regular basis. Complete project to install new, or replace defective existing, meters so that entire production meter population is metered. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing and calibration of related instrumentation for all meter installations. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to further improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Volume from own sources master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its sources of supply	Inventory information on meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined	No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system; tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.	Conditions between 2 and 4	Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include estimate of daily changes in tanks/storage facilities. Meter data is adjusted when gross data errors occur, or occasional meter testing deems this necessary.	Conditions between 4 and 6	Hourly production meter data logged automatically & reviewed on at least a weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and/or error is confirmed by meter accuracy testing. Tank/storage facility elevation changes are automatically used in calculating a balanced "Volume from own sources" component, and data gaps in the archived data are corrected on at least a weekly basis.	Conditions between 6 and 8	Continuous production meter data is logged automatically & reviewed each business day. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Tank/storage facility elevation changes are automatically used in "Volume from own sources" tabulations and data gaps in the archived data are corrected on a daily basis.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically balances flows from all sources and storages; results are reviewed each business day. Tight accountability controls ensure that all data gaps that occur in the archived flow data are quickly detected and corrected. Regular calibrations between SCADA and sources meters ensures minimal data transfer error.
Improvements to attain higher data grading for "Master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature.	<u>to qualify for 4:</u> Install automatic datalogging equipment on production meters. Complete installation of level instrumentation at all tanks/storage facilities and include tank level data in automatic calculation routine in a computerized system. Construct a computerized listing or spreadsheet to archive input volumes, tank/storage volume changes and import/export flows in order to determine the composite "Water Supplied" volume for the distribution system. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps.		<u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly production meter data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Use daily net storage change to balance flows in calculating "Water Supplied" volume. Necessary corrections to data errors are implemented on a weekly basis.		<u>to qualify for 8:</u> Ensure that all flow data is collected and archived on at least an hourly basis. All data is reviewed and detected errors corrected each business day. Tank/storage levels variations are employed in calculating balanced "Water Supplied" component. Adjust production meter data for gross error and inaccuracy confirmed by testing.		<u>to qualify for 10:</u> Link all production and tank/storage facility elevation change data to a Supervisory Control & Data Acquisition (SCADA) System, or similar computerized monitoring/control system, and establish automatic flow balancing algorithm and regularly calibrate between SCADA and source meters. Data is reviewed and corrected each business day.		<u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters. Continue to replace or repair meters as they perform outside of desired accuracy limits. Stay abreast of new and more accurate water level instruments to better record tank/storage levels and archive the variations in storage volume. Keep current with SCADA and data management systems to ensure that archived data is well-managed and error free.
<b>Water Imported:</b>	Select n/a if the water utility's supply is exclusively from its own water resources (no bulk purchased/ imported water)	Less than 25% of imported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of imported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of imported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of imported water sources are metered, meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually for all meter installations. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Imported Volume" component:	<i>(Note: usually the water supplier selling the water - "the Exporter" - to the utility being audited is responsible to maintain the metering installation measuring the imported volume. The utility should coordinate carefully with the Exporter to ensure that adequate meter upkeep takes place and an accurate measure of the Water Imported volume is quantified.)</i>	<u>to qualify for 2:</u> Review bulk water purchase agreements with partner suppliers; confirm requirements for use and maintenance of accurate metering. Identify needs for new or replacement meters with goal to meter all imported water sources.	<u>To qualify for 4:</u> Locate all imported water sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered imported water interconnections and replace obsolete/defective meters.		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all imported water meters, planning for both regular meter accuracy testing and calibration of the related instrumentation. Continue installation of meters on unmetered imported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8:</u> Complete project to install new, or replace defective, meters on all imported water interconnections. Maintain annual meter accuracy testing for all imported water meters and conduct calibration of related instrumentation at least annually. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Continue to conduct calibration of related instrumentation on a semi-annual basis. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Water imported master meter and supply error adjustment:	Select n/a if the Imported water supply is unmeasured, with Imported water quantities estimated on the billing invoices sent by the Exporter to the purchasing Utility.	Inventory information on imported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with water Exporter(s) are missing or written in vague language concerning meter management and testing.	No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Imported supply metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis by the Exporter with necessary corrections implemented. Meter data is adjusted by the Exporter when gross data errors are detected. A coherent data trail exists for this process to protect both the selling and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly Imported supply metered data is logged automatically & reviewed on at least a weekly basis by the Exporter. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error confirmed by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling and the purchasing Utility.	Conditions between 6 and 8	Continuous Imported supply metered flow data is logged automatically & reviewed each business day by the Exporter. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the Exporter. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water imported master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the selling and purchasing Utility.	<u>to qualify for 4:</u> Install automatic datalogging equipment on Imported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the Exporters to jointly review terms of the written agreements regarding meter accuracy testing and data management, revise the terms as necessary.		<u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly Imported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		<u>to qualify for 8:</u> Ensure that all Imported supply metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		<u>to qualify for 10:</u> Conduct accountability checks to confirm that all Imported supply metered data is reviewed and corrected each business day by the Exporter. Results of all meter accuracy tests and data corrections should be available for sharing between the Exporter and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreement between the selling and the purchasing Utility; at least every five years.		<u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the Exporter to help identify meter replacement needs. Keep communication lines with Exporters open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
Water Exported:	Select n/a if the water utility sells no bulk water to neighboring water utilities (no exported water sales)	Less than 25% of exported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of exported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of exported water sources are metered, meter accuracy testing and/or electronic calibration conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Exported Volume" component:  <i>(Note: usually, if the water utility being audited sells (Exports) water to a neighboring purchasing Utility, it is the responsibility of the utility exporting the water to maintain the metering installation measuring the Exported volume. The utility exporting the water should ensure that adequate meter upkeep takes place and an accurate measure of the Water Exported volume is quantified.)</i>		<u>to qualify for 2:</u> Review bulk water sales agreements with purchasing utilities; confirm requirements for use & upkeep of accurate metering. Identify needs to install new, or replace defective meters as needed.	<u>To qualify for 4:</u> Locate all exported water sources on maps and in field, launch meter accuracy testing for existing meters, begin to install meters on unmeasured exported water interconnections and replace obsolete/defective meters		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all exported water meters. Continue installation of meters on unmeasured exported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8:</u> Complete project to install new, or replace defective, meters on all exported water interconnections. Maintain annual meter accuracy testing for all exported water meters. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing for all meters. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Water exported master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its exported supply interconnections.	Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.	No automatic datalogging of exported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Exported metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. Meter data is adjusted by the utility selling (exporting) the water when gross data errors are detected. A coherent data trail exists for this process to protect both the utility exporting the water and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly exported supply metered data is logged automatically & reviewed on at least a weekly basis by the utility selling the water. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error found by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling (exporting) utility and the purchasing Utility.	Conditions between 6 and 8	Continuous exported supply metered flow data is logged automatically & reviewed each business day by the utility selling (exporting) the water. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and any error confirmed by meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling (exporting) Utility and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the utility selling (exporting) the water. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling Utility and purchasing Utility at least once every five years.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Water exported master meter and supply error adjustment" component.		<p><b>to qualify for 2:</b> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the utility selling (exporting) the water and the purchasing Utility.</p>	<p><b>to qualify for 4:</b> Install automatic datalogging equipment on exported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the purchasing utilities to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.</p>		<p><b>to qualify for 6:</b> Refine computerized data collection and archive to include hourly exported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.</p>		<p><b>to qualify for 8:</b> Ensure that all exported metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.</p>		<p><b>to qualify for 10:</b> Conduct accountability checks to confirm that all exported metered flow data is reviewed and corrected each business day by the utility selling the water. Results of all meter accuracy tests and data corrections should be available for sharing between the utility and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreements with the purchasing utilities, at least every five years.</p>		<p><b>to maintain 10:</b> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the purchasing utilities to help identify meter replacement needs. Keep communication lines with the purchasing utilities open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.</p>
<b>AUTHORIZED CONSUMPTION</b>											
Billed metered:	n/a (not applicable). Select n/a only if the entire customer population is not metered and is billed for water service on a flat or fixed rate basis. In such a case the volume entered must be zero.	Less than 50% of customers with volume-based billings from meter readings; flat or fixed rate billing exists for the majority of the customer population	At least 50% of customers with volume-based billing from meter reads; flat rate billing for others. Manual meter reading is conducted with less than 50% meter read success rate, remaining accounts consumption is estimated. Limited meter records, no regular meter testing or replacement. Billing data maintained on paper records, with no auditing.	Conditions between 2 and 4	At least 75% of customers with volume-based, billing from meter reads; flat or fixed rate billing for remaining accounts. Manual meter reading is conducted with at least 50% meter read success rate; consumption for accounts with failed reads is estimated. Purchase records verify age of customer meters; only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Conditions between 4 and 6	At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter records exist, but only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducted by utility personnel.	Conditions between 6 and 8	At least 97% of customers exist with volume-based billing from meter reads. At least 90% customer meter reading success rate; or at least 80% read success rate with planning and budgeting for trials of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) in one or more pilot areas. Good customer meter records. Regular meter accuracy testing guides replacement of statistically significant number of meters each year. Routine auditing of computerized billing records for global and detailed statistics occurs annually by utility personnel, and is verified by third party at least once every five years.	Conditions between 8 and 10	At least 99% of customers exist with volume-based billing from meter reads. At least 95% customer meter reading success rate; or minimum 80% meter reading success rate, with Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) trials underway. Statistically significant customer meter testing and replacement program in place on a continuous basis. Computerized billing with routine, detailed auditing, including field investigation of representative sample of accounts undertaken annually by utility personnel. Audit is conducted by third party auditors at least once every three years.
Improvements to attain higher data grading for "Billed Metered Consumption" component.	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	<p><b>to qualify for 2:</b> Conduct investigations or trials of customer meters to select appropriate meter models. Budget funding for meter installations. Investigate volume based water rate structures.</p>	<p><b>to qualify for 4:</b> Purchase and install meters on unmetered accounts. Implement policies to improve meter reading success. Catalog meter information during meter read visits to identify age/model of existing meters. Test a minimal number of meters for accuracy. Install computerized billing system.</p>		<p><b>to qualify for 6:</b> Purchase and install meters on unmetered accounts. Eliminate flat fee billing and establish appropriate water rate structure based upon measured consumption. Continue to achieve verifiable success in removing manual meter reading barriers. Expand meter accuracy testing. Launch regular meter replacement program. Launch a program of annual auditing of global billing statistics by utility personnel.</p>		<p><b>to qualify for 8:</b> Purchase and install meters on unmetered accounts. If customer meter reading success rate is less than 97%, assess cost-effectiveness of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system for portion or entire system; or otherwise achieve ongoing improvements in manual meter reading success rate to 97% or higher. Refine meter accuracy testing program. Set meter replacement goals based upon accuracy test results. Implement annual auditing of detailed billing records by utility personnel and implement third party auditing at least once every five years.</p>		<p><b>to qualify for 10:</b> Purchase and install meters on unmetered accounts. Launch Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system trials if manual meter reading success rate of at least 99% is not achieved within a five-year program. Continue meter accuracy testing program. Conduct planning and budgeting for large scale meter replacement based upon meter life cycle analysis using cumulative flow target. Continue annual detailed billing data auditing by utility personnel and conduct third party auditing at least once every three years.</p>		<p><b>to maintain 10:</b> Continue annual internal billing data auditing, and third party auditing at least every three years. Continue customer meter accuracy testing to ensure that accurate customer meter readings are obtained and entered as the basis for volume based billing. Stay abreast of improvements in Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) and information management. Plan and budget for justified upgrades in metering, meter reading and billing data management to maintain very high accuracy in customer metering and billing.</p>
Billed unmetered:	Select n/a if it is the policy of the water utility to meter all customer connections and it has been confirmed by detailed auditing that all customers do indeed have a water meter, i.e. no intentionally unmetered accounts exist	Water utility policy does not require customer metering; flat or fixed fee billing is employed. No data is collected on customer consumption. The only estimates of customer population consumption available are derived from data estimation methods using average fixture count multiplied by number of connections, or similar approach.	Water utility policy does not require customer metering; flat or fixed fee billing is employed. Some metered accounts exist in parts of the system (pilot areas or District Metered Areas) with consumption read periodically or recorded on portable dataloggers over one, three, or seven day periods. Data from these sample meters are used to infer consumption for the total customer population. Site specific estimation methods are used for unusual buildings/water uses.	Conditions between 2 and 4	Water utility policy does require metering and volume based billing in general. However, a liberal amount of exemptions and a lack of clearly written and communicated procedures result in up to 20% of billed accounts believed to be unmetered by exemption; or the water utility is in transition to becoming fully metered, and a large number of customers remain unmetered. A rough estimate of the annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 4 and 6	Water utility policy does require metering and volume based billing but established exemptions exist for a portion of accounts such as municipal buildings. As many as 15% of billed accounts are unmetered due to this exemption or meter installation difficulties. Only a group estimate of annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 6 and 8	Water utility policy does require metering and volume based billing for all customer accounts. However, less than 5% of billed accounts remain unmetered because meter installation is hindered by unusual circumstances. The goal is to minimize the number of unmetered accounts. Reliable estimates of consumption are obtained for these unmetered accounts via site specific estimation methods.	Conditions between 8 and 10	Water utility policy does require metering and volume based billing for all customer accounts. Less than 2% of billed accounts are unmetered and exist because meter installation is hindered by unusual circumstances. The goal exists to minimize the number of unmetered accounts to the extent that is economical. Reliable estimates of consumption are obtained at these accounts via site specific estimation methods.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Billed Unmetered Consumption" component:		<p><u>to qualify for 2:</u> Conduct research and evaluate cost/benefit of a new water utility policy to require metering of the customer population; thereby greatly reducing or eliminating unmetered accounts. Conduct pilot metering project by installing water meters in small sample of customer accounts and periodically reading the meters or datalogging the water consumption over one, three, or seven day periods.</p>	<p><u>to qualify for 4:</u> Implement a new water utility policy requiring customer metering. Launch or expand pilot metering study to include several different meter types, which will provide data for economic assessment of full scale metering options. Assess sites with access difficulties to devise means to obtain water consumption volumes. Begin customer meter installation.</p>		<p><u>to qualify for 6:</u> Refine policy and procedures to improve customer metering participation for all but solidly exempt accounts. Assign staff resources to review billing records to identify errant unmetered properties. Specify metering needs and funding requirements to install sufficient meters to significantly reduce the number of unmetered accounts</p>		<p><u>to qualify for 8:</u> Push to install customer meters on a full scale basis. Refine metering policy and procedures to ensure that all accounts, including municipal properties, are designated for meters. Plan special efforts to address "hard-to-access" accounts. Implement procedures to obtain a reliable consumption estimate for the remaining few unmetered accounts awaiting meter installation.</p>		<p><u>to qualify for 10:</u> Continue customer meter installation throughout the service area, with a goal to minimize unmetered accounts. Sustain the effort to investigate accounts with access difficulties, and devise means to install water meters or otherwise measure water consumption.</p>		<p><u>to maintain 10:</u> Continue to refine estimation methods for unmetered consumption and explore means to establish metering, for as many billed remaining unmetered accounts as is economically feasible.</p>
Unbilled metered:	select n/a if all billing-exempt consumption is unmetered.	<p>Billing practices exempt certain accounts, such as municipal buildings, but written policies do not exist, and a reliable count of unbilled metered accounts is unavailable. Meter upkeep and meter reading on these accounts is rare and not considered a priority. Due to poor recordkeeping and lack of auditing, water consumption for all such accounts is purely guesstimated.</p>	<p>Billing practices exempt certain accounts, such as municipal buildings, but only scattered, dated written directives exist to justify this practice. A reliable count of unbilled metered accounts is unavailable. Sporadic meter replacement and meter reading occurs on an as-needed basis. The total annual water consumption for all unbilled, metered accounts is estimated based upon approximating the number of accounts and assigning consumption from actively billed accounts of same meter size.</p>	Conditions between 2 and 4	<p>Dated written procedures permit billing exemption for specific accounts, such as municipal properties, but are unclear regarding certain other types of accounts. Meter reading is given low priority and is sporadic. Consumption is quantified from meter readings where available. The total number of unbilled, unmetered accounts must be estimated along with consumption volumes.</p>	Conditions between 4 and 6	<p>Written policies regarding billing exemptions exist but adherence in practice is questionable. Metering and meter reading for municipal buildings is reliable but sporadic for other unbilled metered accounts. Periodic auditing of such accounts is conducted. Water consumption is quantified directly from meter readings where available, but the majority of the consumption is estimated.</p>	Conditions between 6 and 8	<p>Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.</p>	Conditions between 8 and 10	<p>Clearly written policy identifies the types of accounts given a billing exemption, with emphasis on keeping such accounts to a minimum. Customer meter management and meter reading for these accounts is given proper priority and is reliably conducted. Regular auditing confirms this. Total water consumption for these accounts is taken from reliable readings from accurate meters.</p>
Improvements to attain higher data grading for "Unbilled Metered Consumption" component:		<p><u>to qualify for 2:</u> Reassess the water utility's policy allowing certain accounts to be granted a billing exemption. Draft an outline of a new written policy for billing exemptions, with clear justification as to why any accounts should be exempt from billing, and with the intention to keep the number of such accounts to a minimum.</p>	<p><u>to qualify for 4:</u> Review historic written directives and policy documents allowing certain accounts to be billing-exempt. Draft an outline of a written policy for billing exemptions, identify criteria that grants an exemption, with a goal of keeping this number of accounts to a minimum. Consider increasing the priority of reading meters on unbilled accounts at least annually.</p>		<p><u>to qualify for 6:</u> Draft a new written policy regarding billing exemptions based upon consensus criteria allowing this occurrence. Assign resources to audit meter records and billing records to obtain census of unbilled metered accounts. Gradually include a greater number of these metered accounts to the routes for regular meter reading.</p>		<p><u>to qualify for 8:</u> Communicate the billing exemption policy throughout the organization and implement procedures that ensure proper account management. Conduct inspections of accounts confirmed in unbilled metered status and verify that accurate meters exist and are scheduled for routine meter readings. Gradually increase the number of unbilled metered accounts that are included in regular meter reading routes.</p>		<p><u>to qualify for 10:</u> Ensure that meter management (meter accuracy testing, meter replacement) and meter reading activities for unbilled accounts are accorded the same priority as billed accounts. Establish ongoing annual auditing process to ensure that water consumption is reliably collected and provided to the annual water audit process.</p>		<p><u>to maintain 10:</u> Reassess the utility's philosophy in allowing any water uses to go "unbilled". It is possible to meter and bill all accounts, even if the fee charged for water consumption is discounted or waived. Metering and billing all accounts ensures that water consumption is tracked and water waste from plumbing leaks is detected and minimized.</p>
Unbilled unmetered:		<p>Extent of unbilled, unmetered consumption is unknown due to unclear policies and poor recordkeeping. Total consumption is quantified based upon a purely subjective estimate.</p>	<p>Clear extent of unbilled, unmetered consumption is unknown, but a number of events are randomly documented each year, confirming existence of such consumption, but without sufficient documentation to quantify an accurate estimate of the annual volume consumed.</p>	Conditions between 2 and 4	<p>Extent of unbilled, unmetered consumption is partially known, and procedures exist to document certain events such as miscellaneous fire hydrant uses. Formulae is used to quantify the consumption from such events (time running multiplied by typical flowrate, multiplied by number of events).</p>	Default value of 1.25% of system input volume is employed	<p>Coherent policies exist for some forms of unbilled, unmetered consumption but others await closer evaluation. Reasonable recordkeeping for the managed uses exists and allows for annual volumes to be quantified by inference, but unsupervised uses are guesstimated.</p>	Conditions between 6 and 8	<p>Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events) or temporary meters, and relatively subjective estimates of less regulated use.</p>	Conditions between 8 and 10	<p>Clear policies exist to identify permitted use of water in unbilled, unmetered fashion, with the intention of minimizing this type of consumption. Good records document each occurrence and consumption is quantified via formulae (time running multiplied by typical flow, multiplied by number of events) or use of temporary meters.</p>
Improvements to attain higher data grading for "Unbilled Unmetered Consumption" component:		<p><u>to qualify for 5:</u> Utilize the accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use.</p> <p><u>to qualify for 2:</u> Establish a policy regarding what water uses should be allowed to remain as unbilled and unmetered. Consider tracking a small sample of one such use (ex: fire hydrant flushings).</p>	<p><u>to qualify for 5:</u> Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use.</p> <p><u>to qualify for 4:</u> Evaluate the documentation of events that have been observed. Meet with user groups (ex: for fire hydrants - fire departments, contractors to ascertain their need and/or volume requirements for water from fire hydrants).</p>		<p><u>to qualify for 5:</u> Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process, and should focus on other components since the volume of unbilled, unmetered consumption is usually a relatively small quantity component, and other larger-quantity components should take priority.</p>	<p><u>to qualify for 6 or greater:</u> Finalize policy and begin to conduct field checks to better establish and quantify such usage. Proceed if top-down audit exists and/or a great volume of such use is suspected.</p>	<p><u>to qualify for 8:</u> Assess water utility policy and procedures for various unmetered usages. For example, ensure that a policy exists and permits are issued for use of fire hydrants by persons outside of the utility. Create written procedures for use and documentation of fire hydrants by water utility personnel. Use same approach for other types of unbilled, unmetered water usage.</p>		<p><u>to qualify for 10:</u> Refine written procedures to ensure that all uses of unbilled, unmetered water are overseen by a structured permitting process managed by water utility personnel. Reassess policy to determine if some of these uses have value in being converted to billed and/or metered status.</p>		<p><u>to maintain 10:</u> Continue to refine policy and procedures with intention of reducing the number of allowable uses of water in unbilled and unmetered fashion. Any uses that can feasibly become billed and metered should be converted eventually.</p>

APPARENT LOSSES



Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Unauthorized consumption:		Extent of unauthorized consumption is unknown due to unclear policies and poor recordkeeping. Total unauthorized consumption is guesstimated.	Unauthorized consumption is a known occurrence, but its extent is a mystery. There are no requirements to document observed events, but periodic field reports capture some of these occurrences. Total unauthorized consumption is approximated from this limited data.	conditions between 2 and 4	Procedures exist to document some unauthorized consumption such as observed unauthorized fire hydrant openings. Use formulae to quantify this consumption (time running multiplied typical flowrate, multiplied by number of events).	Default value of 0.25% of volume of water supplied is employed	Coherent policies exist for some forms of unauthorized consumption (more than simply fire hydrant misuse) but others await closer evaluation. Reasonable surveillance and recordkeeping exist for occurrences that fall under the policy. Volumes quantified by inference from these records.	Conditions between 6 and 8	Clear policies and good auditable recordkeeping exist for certain events (ex: tampering with water meters, illegal bypasses of customer meters); but other occurrences have limited oversight. Total consumption is a combination of volumes from formulae (time x typical flow) and subjective estimates of unconfirmed consumption.	Conditions between 8 and 10	Clear policies exist to identify all known unauthorized uses of water. Staff and procedures exist to provide enforcement of policies and detect violations. Each occurrence is recorded and quantified via formulae (estimated time running multiplied by typical flow) or similar methods. All records and calculations should exist in a form that can be audited by a third party.
Improvements to attain higher data grading for "Unauthorized Consumption" component:		to qualify for 5: Use accepted default of 0.25% of volume of water supplied. to qualify for 2: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)	to qualify for 5: Use accepted default of 0.25% of system input volume to qualify for 4: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)		to qualify for 5: Utilize accepted default value of 0.25% of volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process.	to qualify for 6 or greater: Finalize policy updates to clearly identify the types of water consumption that are authorized from those usages that fall outside of this policy and are, therefore, unauthorized. Begin to conduct regular field checks. Proceed if the top-down audit already exists and/or a great volume of such use is suspected.	to qualify for 8: Assess water utility policies to ensure that all known occurrences of unauthorized consumption are outlawed, and that appropriate penalties are prescribed. Create written procedures for detection and documentation of various occurrences of unauthorized consumption as they are uncovered.		to qualify for 10: Refine written procedures and assign staff to seek out likely occurrences of unauthorized consumption. Explore new locking devices, monitors and other technologies designed to detect and thwart unauthorized consumption.		to maintain 10: Continue to refine policy and procedures to eliminate any loopholes that allow or tacitly encourage unauthorized consumption. Continue to be vigilant in detection, documentation and enforcement efforts.
Customer metering inaccuracies:	select n/a only if the entire customer population is unmetered. In such a case the volume entered must be zero.	Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is guesstimated.	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Conditions between 2 and 4	Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than just customer requests, but less than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.	Conditions between 4 and 6	A reliable electronic recordkeeping system for meters exists. The meter population includes a mix of new high performing meters and dated meters with suspect accuracy. Routine, but limited, meter accuracy testing and meter replacement occur. Inaccuracy volume is quantified using a mix of reliable and less certain data.	Conditions between 6 and 8	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for various types of meters.	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for these meters.	Good records of all active customer meters exist and include as a minimum: meter number, account number/location, type, size and manufacturer. Ongoing meter replacement occurs according to a targeted and justified basis. Regular meter accuracy testing gives a reliable measure of composite inaccuracy volume for the customer meter population. New metering technology is embraced to keep overall accuracy improving. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Customer meter inaccuracy volume" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.	to qualify for 4: Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.		to qualify for 6: Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.		to qualify for 8: Expand annual meter accuracy testing to evaluate a statistically significant number of meter makes/models. Expand meter replacement program to replace statistically significant number of poor performing meters each year.		to qualify for 9: Continue efforts to manage meter population with reliable recordkeeping. Test a statistically significant number of meters each year and analyze test results in an ongoing manner to serve as a basis for a target meter replacement strategy based upon accumulated volume throughput.	to qualify for 10: Continue efforts to manage meter population with reliable recordkeeping, meter testing and replacement. Evaluate new meter types and install one or more types in 5-10 customer accounts each year in order to pilot improving metering technology.	to maintain 10: Increase the number of meters tested and replaced as justified by meter accuracy test data. Continually monitor development of new metering technology and Advanced Metering Infrastructure (AMI) to grasp opportunities for greater accuracy in metering of water flow and management of customer consumption data.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Systematic Data Handling Errors:	Note: all water utilities incur some amount of this error. Even in water utilities with unmetered customer populations and fixed rate billing, errors occur in annual billing tabulations. Enter a positive value for the volume and select a grading.	Policies and procedures for activation of new customer water billing accounts are vague and lack accountability. Billing data is maintained on paper records which are not well organized. No auditing is conducted to confirm billing data handling efficiency. An unknown number of customers escape routine billing due to lack of billing process oversight.	Policy and procedures for activation of new customer accounts and oversight of billing records exist but need refinement. Billing data is maintained on paper records or insufficiently capable electronic database. Only periodic unstructured auditing work is conducted to confirm billing data handling efficiency. The volume of unbilled water due to billing lapses is a guess.	Conditions between 2 and 4	Policy and procedures for new account activation and oversight of billing operations exist but needs refinement. Computerized billing system exists, but is dated or lacks needed functionality. Periodic, limited internal audits conducted and confirm with approximate accuracy the consumption volumes lost to billing lapses.	Conditions between 4 and 6	Policy and procedures for new account activation and oversight of billing operations is adequate and reviewed periodically. Computerized billing system is in use with basic reporting available. Any effect of billing adjustments on measured consumption volumes is well understood. Internal checks of billing data error conducted annually. Reasonably accurate quantification of consumption volume lost to billing lapses is obtained.	Conditions between 6 and 8	New account activation and billing operations policy and procedures are reviewed at least biannually. Computerized billing system includes an array of reports to confirm billing data and system functionality. Checks are conducted routinely to flag and explain zero consumption accounts. Annual internal checks conducted with third party audit conducted at least once every five years. Accountability checks flag billing lapses. Consumption lost to billing lapses is well quantified and reducing year-by-year.	Conditions between 8 and 10	Sound written policy and procedures exist for new account activation and oversight of customer billing operations. Robust computerized billing system gives high functionality and reporting capabilities which are utilized, analyzed and the results reported each billing cycle. Assessment of policy and data handling errors are conducted internally and audited by third party at least once every three years, ensuring consumption lost to billing lapses is minimized and detected as it occurs.
Improvements to attain higher data grading for "Systematic Data Handling Error volume" component:		to qualify for 2: Draft written policy and procedures for activating new water billing accounts and oversight of billing operations. Investigate and budget for computerized customer billing system. Conduct initial audit of billing records by flow-charting the basic business processes of the customer account/billing function.	to qualify for 4: Finalize written policy and procedures for activation of new billing accounts and overall billing operations management. Implement a computerized customer billing system. Conduct initial audit of billing records as part of this process.		to qualify for 6: Refine new account activation and billing operations procedures and ensure consistency with the utility policy regarding billing, and minimize opportunity for missed billings. Upgrade or replace customer billing system for needed functionality - ensure that billing adjustments don't corrupt the value of consumption volumes. Procedurize internal annual audit process.		to qualify for 8: Formalize regular review of new account activation process and general billing practices. Enhance reporting capability of computerized billing system. Formalize regular auditing process to reveal scope of data handling error. Plan for periodic third party audit to occur at least once every five years.		to qualify for 10: Close policy/procedure loopholes that allow some customer accounts to go unbilled, or data handling errors to exist. Ensure that billing system reports are utilized, analyzed and reported every billing cycle. Ensure that internal and third party audits are conducted at least once every three years.		to maintain 10: Stay abreast of customer information management developments and innovations. Monitor developments of Advanced Metering Infrastructure (AMI) and integrate technology to ensure that customer endpoint information is well-monitored and errors/lapses are at an economic minimum.
<b>SYSTEM DATA</b>											
Length of mains:		Poorly assembled and maintained paper as-built records of existing water main installations makes accurate determination of system pipe length impossible. Length of mains is guesstimated.	Paper records in poor or uncertain condition (no annual tracking of installations & abandonments). Poor procedures to ensure that new water mains installed by developers are accurately documented.	Conditions between 2 and 4	Sound written policy and procedures exist for documenting new water main installations, but gaps in management result in an uncertain degree of error in tabulation of mains length.	Conditions between 4 and 6	Sound written policy and procedures exist for permitting and commissioning new water mains. Highly accurate paper records with regular field validation; or electronic records and asset management system in good condition. Includes system backup.	Conditions between 6 and 8	Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographic Information System (GIS) and asset management system are used to store and manage data.	Conditions between 8 and 10	Sound written policy exists for managing water mains extensions and replacements. Geographic Information System (GIS) data and asset management database agree and random field validation proves truth of databases. Records of annual field validation should be available for review.
Improvements to attain higher data grading for "Length of Water Mains" component:		to qualify for 2: Assign personnel to inventory current as-built records and compare with customer billing system records and highway plans in order to verify poorly documented pipelines. Assemble policy documents regarding permitting and documentation of water main installations by the utility and building developers; identify gaps in procedures that result in poor documentation of new water main installations.	to qualify for 4: Complete inventory of paper records of water main installations for several years prior to audit year. Review policy and procedures for commissioning and documenting new water main installation.		to qualify for 6: Finalize updates/improvements to written policy and procedures for permitting/commissioning new main installations. Confirm inventory of records for five years prior to audit year; correct any errors or omissions.		to qualify for 8: Launch random field checks of limited number of locations. Convert to electronic database such as a Geographic Information System (GIS) with backup as justified. Develop written policy and procedures.		to qualify for 10: Link Geographic Information System (GIS) and asset management databases, conduct field verification of data. Record field verification information at least annually.		to maintain 10: Continue with standardization and random field validation to improve the completeness and accuracy of the system.
Number of active AND inactive service connections:		Vague permitting (of new service connections) policy and poor paper recordkeeping of customer connections/billings result in suspect determination of the number of service connections, which may be 10-15% in error from actual count.	General permitting policy exists but paper records, procedural gaps, and weak oversight result in questionable total for number of connections, which may vary 5-10% of actual count.	Conditions between 2 and 4	Written account activation policy and procedures exist, but with some gaps in performance and oversight. Computerized information management system is being brought online to replace dated paper recordkeeping system. Reasonably accurate tracking of service connection installations & abandonments; but count can be up to 5% in error from actual total.	Conditions between 4 and 6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Conditions between 6 and 8	Policies and procedures for new account activation and overall billing operations are written, well-structured and reviewed at least biannually. Well-managed computerized information management system exists and routine, periodic field checks and internal system audits are conducted. Counts of connections are no more than 2% in error.	Conditions between 8 and 10	Sound written policy and well managed and audited procedures ensure reliable management of service connection population. Computerized information management system, Customer Billing System, and Geographic Information System (GIS) information agree; field validation proves truth of databases. Count of connections recorded as being in error is less than 1% of the entire population.
Improvements to attain higher data grading for "Number of Active and Inactive Service Connections" component:	Note: The number of Service Connections does not include fire hydrant leads/lines connecting the hydrant to the water main	to qualify for 2: Draft new policy and procedures for new account activation and overall billing operations. Research and collect paper records of installations & abandonments for several years prior to audit year.	to qualify for 4: Refine policy and procedures for new account activation and overall billing operations. Research computerized recordkeeping system (Customer Information System or Customer Billing System) to improve documentation format for service connections.		to qualify for 6: Refine procedures to ensure consistency with new account activation and overall billing policy to establish new service connections or decommission existing connections. Improve process to include all totals for at least five years prior to audit year.		to qualify for 8: Formalize regular review of new account activation and overall billing operations policies and procedures. Launch random field checks of limited number of locations. Develop reports and auditing mechanisms for computerized information management system.		to qualify for 10: Close any procedural loopholes that allow installations to go undocumented. Link computerized information management system with Geographic Information System (GIS) and formalize field inspection and information system auditing processes. Documentation of new or decommissioned service connections encounters several levels of checks and balances.		to maintain 10: Continue with standardization and random field validation to improve knowledge of system.
	Note: if customer water	Gratings 1-9 apply if customer properties are unmetered, if customer meters exist and are located inside the customer building premises, or if the water utility owns and is responsible for the entire service connection piping from the water main to the customer building. In any of these cases the average distance between the curb stop or boundary separating utility/customer responsibility for service connection piping, and the typical first point of use (ex: faucet) or the customer meter must be quantified. Gratings of 1-9 are used to grade the validity of the means to quantify this value. (See the "Service Connection Diagram" worksheet)									Either of two conditions can be met for a grading of 10:

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Average length of customer service line:	meters are located outside of the customer building next to the curb stop or boundary separating utility/customer responsibility, then the auditor should answer "Yes" to the question on the Reporting Worksheet asking about this. If the answer is Yes, the grading description listed under the Grading of 10(a) will be followed, with a value of zero automatically entered at a Grading of 10. See the Service Connection Diagram worksheet for a visual presentation of this distance.	Vague policy exists to define the delineation of water utility ownership and customer ownership of the service connection piping. Curb stops are perceived as the breakpoint but these have not been well-maintained or documented. Most are buried or obscured. Their location varies widely from site-to-site, and estimating this distance is arbitrary due to the unknown location of many curb stops.	Policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. The piping from the water main to the curb stop is the property of the water utility; and the piping from the curb stop to the customer building is owned by the customer. Curb stop locations are not well documented and the average distance is based upon a limited number of locations measured in the field.	Conditions between 2 and 4	Good policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. Curb stops are generally installed as needed and are reasonably documented. Their location varies widely from site-to-site, and an estimate of this distance is hindered by the availability of paper records of limited accuracy.	Conditions between 4 and 6	Clear written policy exists to define utility/customer responsibility for service connection piping. Accurate, well-maintained paper or basic electronic recordkeeping system exists. Periodic field checks confirm piping lengths for a sample of customer properties.	Conditions between 6 and 8	Clearly worded policy standardizes the location of curb stops and meters, which are inspected upon installation. Accurate and well maintained electronic records exist with periodic field checks to confirm locations of service lines, curb stops and customer meter pits. An accurate number of customer properties from the customer billing system allows for reliable averaging of this length.	Conditions between 8 and 10	a) Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer "Yes" to the question on the Reporting Working asking about this condition. A value of zero and a Grading of 10 are automatically entered in the Reporting Worksheet . b). Meters exist inside customer buildings, or properties are unmetered. In either case, answer "No" to the Reporting Worksheet question on meter location, and enter a distance determined by the auditor. For a Grading of 10 this value must be a very reliable number from a Geographic Information System (GIS) and confirmed by a statistically valid number of field checks.
Improvements to attain higher data grading for "Average Length of Customer Service Line" component:		<u>to qualify for 2:</u> Research and collect paper records of service line installations. Inspect several sites in the field using pipe locators to locate curb stops. Obtain the length of this small sample of connections in this manner.	<u>to qualify for 4:</u> Formalize and communicate policy delineating utility/customer responsibilities for service connection piping. Assess accuracy of paper records by field inspection of a small sample of service connections using pipe locators as needed. Research the potential migration to a computerized information management system to store service connection data.		<u>to qualify for 6:</u> Establish coherent procedures to ensure that policy for curb stop, meter installation and documentation is followed. Gain consensus within the water utility for the establishment of a computerized information management system.		<u>to qualify for 8:</u> Implement an electronic means of recordkeeping, typically via a customer information system, customer billing system, or Geographic Information System (GIS). Standardize the process to conduct field checks of a limited number of locations.		<u>to qualify for 10:</u> Link customer information management system and Geographic Information System (GIS), standardize process for field verification of data.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve knowledge of service connection configurations and customer meter locations.
Average operating pressure:		Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain, high system head loss and weak/erratic pressure controls further compromise the validity of the average pressure calculation.	Limited telemetry monitoring of scattered pumping station and water storage tank sites provides some static pressure data, which is recorded in handwritten logbooks. Pressure data is gathered at individual sites only when low pressure complaints arise. Average pressure is determined by averaging relatively crude data, and is affected by significant variation in ground elevations, system head loss and gaps in pressure controls in the distribution system.	Conditions between 2 and 4	Effective pressure controls separate different pressure zones; moderate pressure variation across the system; occasional open boundary valves are discovered that breach pressure zones. Basic telemetry monitoring of the distribution system logs pressure data electronically. Pressure data gathered by gauges or dataloggers at fire hydrants or buildings when low pressure complaints arise, and during fire flow tests and system flushing. Reliable topographical data exists. Average pressure is calculated using this mix of data.	Conditions between 4 and 6	Reliable pressure controls separate distinct pressure zones; only very occasional open boundary valves are encountered that breach pressure zones. Well-covered telemetry monitoring of the distribution system (not just pumping at source treatment plants or wells) logs extensive pressure data electronically. Pressure gathered by gauges/dataloggers at fire hydrants and buildings when low pressure complaints arise, and during fire flow tests and system flushing. Average pressure is determined by using this mix of reliable data.	Conditions between 6 and 8	Well-managed, discrete pressure zones exist with generally predictable pressure fluctuations. A current full-scale SCADA System or similar realtime monitoring system exists to monitor the water distribution system and collect data, including real time pressure readings at representative sites across the system. The average system pressure is determined from reliable monitoring system data.	Conditions between 8 and 10	Well-managed pressure districts/zones, SCADA System and hydraulic model exist to give very precise pressure data across the water distribution system. Average system pressure is reliably calculated from extensive, reliable, and cross-checked data. Calculations are reported on an annual basis as a minimum.
Improvements to attain higher data grading for "Average Operating Pressure" component:		<u>to qualify for 2:</u> Employ pressure gauging and/or datalogging equipment to obtain pressure measurements from fire hydrants. Locate accurate topographical maps of service area in order to confirm ground elevations. Research pump data sheets to find pump pressure/flow characteristics	<u>to qualify for 4:</u> Formalize a procedure to use pressure gauging/datalogging equipment to gather pressure data during various system events such as low pressure complaints, or operational testing. Gather pump pressure and flow data at different flow regimes. Identify faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) and plan to properly configure pressure zones. Make all pressure data from these efforts available to generate system-wide average pressure.		<u>to qualify for 6:</u> Expand the use of pressure gauging/datalogging equipment to gather scattered pressure data at a representative set of sites, based upon pressure zones or areas. Utilize pump pressure and flow data to determine supply head entering each pressure zone or district. Correct any faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) to ensure properly configured pressure zones. Use expanded pressure dataset from these activities to generate system-wide average pressure.		<u>to qualify for 8:</u> Install a Supervisory Control and Data Acquisition (SCADA) System, or similar realtime monitoring system, to monitor system parameters and control operations. Set regular calibration schedule for instrumentation to insure data accuracy. Obtain accurate topographical data and utilize pressure data gathered from field surveys to provide extensive, reliable data for pressure averaging.		<u>to qualify for 10:</u> Annually, obtain a system-wide average pressure value from the hydraulic model of the distribution system that has been calibrated via field measurements in the water distribution system and confirmed in comparisons with SCADA System data.		<u>to maintain 10:</u> Continue to refine the hydraulic model of the distribution system and consider linking it with SCADA System for real-time pressure data calibration, and averaging.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
<b>COST DATA</b>											
Total annual cost of operating water system:		Incomplete paper records and lack of financial accounting documentation on many operating functions makes calculation of water system operating costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to estimate the major portion of water system operating costs.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. However, gaps in data are known to exist, periodic internal reviews are conducted but not a structured financial audit.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited periodically by utility personnel, but not a Certified Public Accountant (CPA).	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited at least annually by utility personnel, and at least once every three years by third-party CPA.	Conditions between 8 and 10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.
Improvements to attain higher data grading for "Total Annual Cost of Operating the Water System" component:		<u>to qualify for 2:</u> Gather available records, institute new financial accounting procedures to regularly collect and audit basic cost data of most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Establish process for periodic internal audit of water system operating costs; identify cost data gaps and institute procedures for tracking these outstanding costs.		<u>to qualify for 8:</u> Standardize the process to conduct routine financial audit on an annual basis. Arrange for CPA audit of financial records at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and long-term cost trend, and budget/track costs proactively
Customer retail unit cost (applied to Apparent Losses):	Customer population unmetered, and/or only a fixed fee is charged for consumption.	Antiquated, cumbersome water rate structure is used, with periodic historic amendments that were poorly documented and implemented; resulting in classes of customers being billed inconsistent charges. The actual composite billing rate likely differs significantly from the published water rate structure, but a lack of auditing leaves the degree of error indeterminate.	Dated, cumbersome water rate structure, not always employed consistently in actual billing operations. The actual composite billing rate is known to differ from the published water rate structure, and a reasonably accurate estimate of the degree of error is determined, allowing a composite billing rate to be quantified.	Conditions between 2 and 4	Straight-forward water rate structure in use, but not updated in several years. Billing operations reliably employ the rate structure. The composite billing rate is derived from a single customer class such as residential customer accounts, neglecting the effect of different rates from varying customer classes.	Conditions between 4 and 6	Clearly written, up-to-date water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average residential rate using volumes of water in each rate block.	Conditions between 6 and 8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate, which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Conditions between 8 and 10	Current, effective water rate structure is in force and applied reliably in billing operations. The rate structure and calculations of composite rate - which includes residential, commercial, industrial, institutional (CII), and other distinct customer classes - are reviewed by a third party knowledgeable in the M36 methodology at least once every five years.
Improvements to attain higher data grading for "Customer Retail Unit Cost" component:		<u>to qualify for 2:</u> Formalize the process to implement water rates, including a secure documentation procedure. Create a current, formal water rate document and gain approval from all stakeholders.	<u>to qualify for 4:</u> Review the water rate structure and update/formalize as needed. Assess billing operations to ensure that actual billing operations incorporate the established water rate structure.		<u>to qualify for 6:</u> Evaluate volume of water used in each usage block by residential users. Multiply volumes by full rate structure.	<u>Launch effort to fully meter the customer population and charge rates based upon water volumes</u>	<u>to qualify for 8:</u> Evaluate volume of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to qualify for 10:</u> Conduct a periodic third-party audit of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to maintain 10:</u> Keep water rate structure current in addressing the water utility's revenue needs. Update the calculation of the customer unit rate as new rate components, customer classes, or other components are modified.
Variable production cost (applied to Real Losses):	Note: if the water utility purchases/imports its entire water supply, then enter the unit purchase cost of the bulk water supply in the Reporting Worksheet with a grading of 10	Incomplete paper records and lack of documentation on primary operating functions (electric power and treatment costs most importantly) makes calculation of variable production costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to roughly estimate the basic operations costs (pumping power costs and treatment costs) and calculate a unit variable production cost.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. Electric power and treatment costs are reliably tracked and allow accurate weighted calculation of unit variable production costs based on these two inputs and water imported purchase costs (if applicable). All costs are audited internally on a periodic basis.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent primary and secondary variable production and water imported purchase (if applicable) costs tracked. The data is audited at least annually by utility personnel, and at least once every three years by a third-party knowledgeable in the M36 methodology.	Conditions between 8 and 10	Either of two conditions can be met to obtain a grading of 10: 1) Third party CPA audit of all pertinent primary and secondary variable production and water imported purchase (if applicable) costs on an annual basis. or: 2) Water supply is entirely purchased as bulk water imported, and the unit purchase cost - including all applicable marginal supply costs - serves as the variable production cost. If all applicable marginal supply costs are not included in this figure, a grade of 10 should <u>not</u> be selected.
Improvements to attain higher data grading for "Variable Production Cost" component:		<u>to qualify for 2:</u> Gather available records, institute new procedures to regularly collect and audit basic cost data and most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Formalize process for regular internal audits of production costs. Assess whether additional costs (liability, residuals management, equipment wear, impending infrastructure expansion) should be included to calculate a more representative variable production cost.		<u>to qualify for 8:</u> Formalize the accounting process to include direct cost components (power, treatment) as well as indirect cost components (liability, residuals management, etc.) Arrange to conduct audits by a knowledgeable third-party at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and budget/track costs proactively



# AWWA Free Water Audit Software: Determining Water Loss Standing

WAS v5.0

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Water Audit Report for: Groveland Community Services District (CA5510009)  
 Reporting Year: 2016 1/2016 - 12/2016  
 Data Validity Score: 51

## Water Loss Control Planning Guide

Water Audit Data Validity Level / Score					
Functional Focus Area	Level I (0-25)	Level II (26-50)	Level III (51-70)	Level IV (71-90)	Level V (91-100)
Audit Data Collection	Launch auditing and loss control team; address production metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs. Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table)	Performance Benchmarking - ILI is meaningful in comparing real loss standing	Identify Best Practices/ Best in class - the ILI is very reliable as a real loss performance indicator for best in class service

*For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.*

Once data have been entered into the Reporting Worksheet, the performance indicators are automatically calculated. How does a water utility operator know how well his or her system is performing? The AWWA Water Loss Control Committee provided the following table to assist water utilities in gauging an approximate Infrastructure Leakage Index (ILI) that is appropriate for their water system and local conditions. The lower the amount of leakage and real losses that exist in the system, then the lower the ILI value will be.

**Note:** this table offers an approximate guideline for leakage reduction target-setting. The best means of setting such targets include performing an economic assessment of various loss control methods. However, this table is useful if such an assessment is not possible.

**General Guidelines for Setting a Target ILI  
(without doing a full economic analysis of leakage control options)**

Target ILI Range	Financial Considerations	Operational Considerations	Water Resources Considerations
<b>1.0 - 3.0</b>	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulation or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
<b>&gt;3.0 -5.0</b>	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions (leakage management, water conservation) are included in the long-term
<b>&gt;5.0 - 8.0</b>	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
<b>Greater than 8.0</b>	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective utilization of water as a resource. Setting a target level greater than 8.0 - other than as an incremental goal to a smaller long-term target - is discouraged.		
<b>Less than 1.0</b>	If the calculated Infrastructure Leakage Index (ILI) value for your system is 1.0 or less, two possibilities exist. a) you are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control. b) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI value but do not employ extensive leakage control practices in your operations. In such cases it is beneficial to validate the data by performing field measurements to confirm the accuracy of production and customer meters, or to identify any other potential sources of error in the data.		

**DEPARTMENT OF WATER RESOURCES**

1416 NINTH STREET, P.O. BOX 942836  
SACRAMENTO, CA 94236-0001  
(916) 653-5791



September 25, 2018

Jon Sterling  
General Manager/Operations and Maintenance  
Groveland Community Services District  
18966 Ferretti Road  
Groveland, CA 95321

Subject: The 2017 Validated Water Loss Audit Report

Dear Mr./Ms. Sterling:

The Department of Water Resources (DWR) has reviewed the Groveland Community Services District's 2017 Validated Water Loss Audit Report. California Water Code (CWC) Section 10608.34 directs DWR to review all submitted validated water loss audit reports. Our review finds that the report addresses the code requirements. The validated water loss audit reports are posted at our website:

<https://wuedata.water.ca.gov>.

If you have any questions regarding water loss audits and reports, please contact Todd Thompson at [todd.thompson@water.ca.gov](mailto:todd.thompson@water.ca.gov) or 916-651-9255

Sincerely

A handwritten signature in blue ink, appearing to read "Vicki Lake".

Vicki Lake  
Unit Chief  
Urban Water Use Efficiency  
(916) 651-0740

Electronic cc:  
Alfonso Manrique, AM Consulting Engineers

# AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

## Please begin by providing the following information

Name of Contact Person:

Email Address:

Telephone | Ext.:

Name of City / Utility:

City/Town/Municipality:

State / Province:

Country:

Year:  Calendar Year

Audit Preparation Date:

Volume Reporting Units:

PWSID / Other ID:

## The following guidance will help you complete the Audit

All audit data are entered on the [Reporting Worksheet](#)

- 
- Value can be entered by user
- 
- Value calculated based on input data
- 
- These cells contain recommended default values

Use of Option (Radio) Buttons:  Pcnt:   Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

<p><b><u>Instructions</u></b></p> <p>The current sheet. Enter contact information and basic audit details (year, units etc)</p>	<p><b><u>Reporting Worksheet</u></b></p> <p>Enter the required data on this worksheet to calculate the water balance and data grading</p>	<p><b><u>Comments</u></b></p> <p>Enter comments to explain how values were calculated or to document data sources</p>	<p><b><u>Performance Indicators</u></b></p> <p>Review the performance indicators to evaluate the results of the audit</p>	<p><b><u>Water Balance</u></b></p> <p>The values entered in the Reporting Worksheet are used to populate the Water Balance</p>	<p><b><u>Dashboard</u></b></p> <p>A graphical summary of the water balance and Non-Revenue Water components</p>
<p><b><u>Grading Matrix</u></b></p> <p>Presents the possible grading options for each input component of the audit</p>	<p><b><u>Service Connection Diagram</u></b></p> <p>Diagrams depicting possible customer service connection line configurations</p>	<p><b><u>Definitions</u></b></p> <p>Use this sheet to understand the terms used in the audit process</p>	<p><b><u>Loss Control Planning</u></b></p> <p>Use this sheet to interpret the results of the audit validity score and performance indicators</p>	<p><b><u>Example Audits</u></b></p> <p>Reporting Worksheet and Performance Indicators examples are shown for two validated audits</p>	<p><b><u>Acknowledgements</u></b></p> <p>Acknowledgements for the AWWA Free Water Audit Software v5.0</p>

If you have questions or comments regarding the software please contact us via email at: [wlc@awwa.org](mailto:wlc@awwa.org)





# AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

American Water Works Association

?	Click to access definition
+	Click to add a comment

**Water Audit Report for:** Groveland Community Services District (CA5510009)  
**Reporting Year:** 2017 / 1/2017 - 12/2017

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

**All volumes to be entered as: MILLION GALLONS (US) PER YEAR**

To select the correct data grading for each input, determine the highest grade where the

### WATER SUPPLIED

<----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+	?	7	118.470	MG/Yr
Water imported:	+	?	n/a		MG/Yr
Water exported:	+	?	n/a		MG/Yr

### Master Meter and Supply Error Adjustments

+	?	2	Pcnt:	Value:	
+	?		Pcnt:	Value:	MG/Yr
+	?		Pcnt:	Value:	MG/Yr
+	?		Pcnt:	Value:	MG/Yr

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

**WATER SUPPLIED: 118.470** MG/Yr

### AUTHORIZED CONSUMPTION

Billed metered:	+	?	6	96.810	MG/Yr
Billed unmetered:	+	?	n/a		MG/Yr
Unbilled metered:	+	?	7	3.000	MG/Yr
Unbilled unmetered:	+	?		1.481	MG/Yr

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

**AUTHORIZED CONSUMPTION: 101.291** MG/Yr

Click here: ?  
for help using option buttons below

Pcnt: 1.25% Value:  MG/Yr

Use buttons to select percentage of water supplied  
**OR**  
value

Pcnt: 0.25% Value:  MG/Yr

Pcnt: 1.00% Value:  MG/Yr

Pcnt: 0.25% Value:  MG/Yr

### WATER LOSSES (Water Supplied - Authorized Consumption)

**17.179** MG/Yr

#### Apparent Losses

Unauthorized consumption: + ?  0.296 MG/Yr

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

Customer metering inaccuracies:	+	?	4	1.008	MG/Yr
Systematic data handling errors:	+	?		0.242	MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

**Apparent Losses: 1.546** MG/Yr

#### Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 15.633 MG/Yr

**WATER LOSSES: 17.179** MG/Yr

### NON-REVENUE WATER

**NON-REVENUE WATER: 21.660** MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

### SYSTEM DATA

Length of mains:	+	?	3	71.0	miles
Number of <u>active AND inactive</u> service connections:	+	?	8	3,255	
Service connection density:	?			46	conn./mile main

Are customer meters typically located at the curbside or property line? Yes

Average length of customer service line: + ?  (length of service line, beyond the property boundary, that is the responsibility of the utility)

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

Average operating pressure: + ? 3 122.0 psi

### COST DATA

Total annual cost of operating water system:	+	?	10	\$2,727,476	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	6	\$9.43	\$/1000 gallons (US)
Variable production cost (applied to Real Losses):	+	?	7	\$2,553.00	\$/Million gallons <input type="checkbox"/> Use Customer Retail Unit Cost to value real losses

### WATER AUDIT DATA VALIDITY SCORE:

\*\*\* YOUR SCORE IS: 65 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: Customer metering inaccuracies
- 3: Billed metered



## AWWA Free Water Audit Software: System Attributes and Performance Indicators

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Water Audit Report for: Groveland Community Services District (CA5510009)  
 Reporting Year: 2017 1/2017 - 12/2017

\*\*\* YOUR WATER AUDIT DATA VALIDITY SCORE IS: 65 out of 100 \*\*\*

System Attributes:

	Apparent Losses:	1.546	MG/Yr
+	Real Losses:	15.633	MG/Yr
=	<b>Water Losses:</b>	<b>17.179</b>	MG/Yr

? Unavoidable Annual Real Losses (UARL): 38.85 MG/Yr

Annual cost of Apparent Losses: \$14,582

Annual cost of Real Losses: \$39,910 Valued at **Variable Production Cost**

Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial: { Non-revenue water as percent by volume of Water Supplied: 18.3%  
 Non-revenue water as percent by cost of operating system: 2.4% Real Losses valued at Variable Production Cost

Operational Efficiency: { Apparent Losses per service connection per day: 1.30 gallons/connection/day  
 Real Losses per service connection per day: 13.16 gallons/connection/day  
 Real Losses per length of main per day\*: N/A  
 Real Losses per service connection per day per psi pressure: 0.11 gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL): 15.63 million gallons/year

? Infrastructure Leakage Index (ILI) [CARL/UARL]: 0.40

\* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



## AWWA Free Water Audit Software: User Comments

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Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

<b>General Comment:</b>	
Audit Item	Comment
<a href="#">Volume from own sources:</a>	This volume was reported by GCSD to be Volume of Imported Water. Reclassified as VOS. Metered data is from raw water meters upstream of GCSD WTPs. Currently readings are not taken at meters directly downstream of existing WTPs. Assumption is that there are no losses in treatment process for this validation, which isn't likely the reality. GCSD should look at getting meter reads just downstream of WTP. Since GCSD treats surface water from SFPUD, the water is classified as VOS not imported water. DVG = 7. 100% of sources metered. Only calibration seems to be performed on the meters. GCSD would need to do both calibration and accuracy testing to get more than a 7.
<a href="#">Vol. from own sources: Master meter error adjustment:</a>	GCSD has 5 tanks across the system and no data was provided showing tracking of tank volume changes. GCSD confirmed that tank levels not records therefore no water balance across the system can take place. DVG is a 2. To get a 4 or more, at a minimum tank levels must be recorded.
<a href="#">Water imported:</a>	It appears that import water is misclassified and should be VOS. GCSD agrees with reclassification. Value is left blank
<a href="#">Water imported: master meter error adjustment:</a>	Not applicable, GCSD does not import finished potable water
<a href="#">Water exported:</a>	GCSD does not export finished potable water, cell is left blank
<a href="#">Water exported: master meter error adjustment:</a>	Not applicable, GCSD does not export finished potable water
<a href="#">Billed metered:</a>	GCSD reports only problematic meters get meter testing. Not proactive replacement/testing approach. Internal audits occur monthly. DVG=6. Need strategic proactive approach to meter testing and replacement to get more than DVG=6.
<a href="#">Billed unmetered:</a>	Not applicable 100% metered
<a href="#">Unbilled metered:</a>	3 MG/Yr that was originally classified as "Unbilled Unmetered" is reclassified to here. GCSD meters and tracks unbilled water use for directional flushing, auto flushers, tank cleaning activities, etc. DVG=7. To get DVG of 8 or more meter testing should occur to demonstrate meter accuracy.
<a href="#">Unbilled unmetered:</a>	GCSD originally reported 3 MG/Yr for "unbilled unmetered", but this was reclassified as "unbilled metered" since GCSD meters institutional type activities like directional flushing, auto flushers, tank cleaning activities, etc. Default value used after volume was reclassified.

Audit Item	Comment
<a href="#">Unauthorized consumption:</a>	Default used
<a href="#">Customer metering inaccuracies:</a>	Customer meter accuracy testing is only performed on problem meters (customer complaints, suspicious billing reads, ect.) 1% was used, GCSD could not substantiate the 1% value, but this value is within the AWWA recommended range for customer metering inaccuracies. Using 1% is understating apparent losses and overstating real losses. DVG = 4. Accelerated customer meter replacement due to testing would allow for higher DVG.
<a href="#">Systematic data handling errors:</a>	Default used.
<a href="#">Length of mains:</a>	Audit reporting worksheet provided by GCSD says 71 miles. Comments in GCSD audit say 70. GCSD confirmed length is about 71 miles. The additional mile to get total from 70 to 71 miles is the hydrant lateral length. DVG=3. To get DVG=4 or more GCSD to shore up inventory of water main records and process for documenting new main installations.
<a href="#">Number of active AND inactive service connections:</a>	3,255 total connections, includes active and inactive. Data from GCSD provided spreadsheet. DVG = 8. GCSD to close any procedural loopholes for new connections and establish a GIS database for connections.
<a href="#">Average length of customer service line:</a>	Default used since typically meter is installed at property boundary.
<a href="#">Average operating pressure:</a>	122 psi per fire flow testing reading as provided by GCSD. DVG=3. Need to incorporate more than one single pressure test read to get a high DVG.
<a href="#">Total annual cost of operating water system:</a>	State of the art accountin system used and CPA performs financial audit annually. DVG=10
<a href="#">Customer retail unit cost (applied to Apparent Losses):</a>	GCSD has a rate structure. The unit cost shown in this audit is the average of the total of the metered deliveries to customer divided by the total revenue generated for the 2017 year. A weighted average approach was not used for the retail cost but more of a straight line approach. Effects of tiered rate structures is not included in this calc. DVG=6. Calculating the retail cost while accounting for the tiered rate structure would yield a higher DVG.
<a href="#">Variable production cost (applied to Real Losses):</a>	water costs, chemicals, and UV bulbs are tracked and figured into variable costs. GCSD confirmed that these are the only variable costs for their system. DVG =7. GCSD should formalize audit process with a CPA to earn higher DVG.



# AWWA Free Water Audit Software: Water Balance

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Water Audit Report for:	Groveland Community Services District (CA5510009)	
Reporting Year:	2017	1/2017 - 12/2017
Data Validity Score:	65	

		Water Exported	Billed Water Exported				Revenue Water
		0.000		Billed Authorized Consumption	Billed Metered Consumption (water exported is removed)	Billed Unmetered Consumption	0.000
Own Sources (Adjusted for known errors)	System Input	Water Supplied	Authorized Consumption	96.810	96.810	0.000	Revenue Water
				101.291	Unbilled Authorized Consumption	Unbilled Metered Consumption	Unbilled Unmetered Consumption
			Water Losses	Apparent Losses	Unbilled Metered Consumption	Unbilled Unmetered Consumption	Non-Revenue Water (NRW)
				17.179	1.546	3.000	
Water Imported		Real Losses	Unauthorized Consumption	Customer Metering Inaccuracies	Systematic Data Handling Errors	21.660	
0.000			15.633	0.296	1.008	0.242	
				Leakage on Transmission and/or Distribution Mains <i>Not broken down</i>	Leakage and Overflows at Utility's Storage Tanks <i>Not broken down</i>	Leakage on Service Connections <i>Not broken down</i>	



# AWWA Free Water Audit Software: Dashboard

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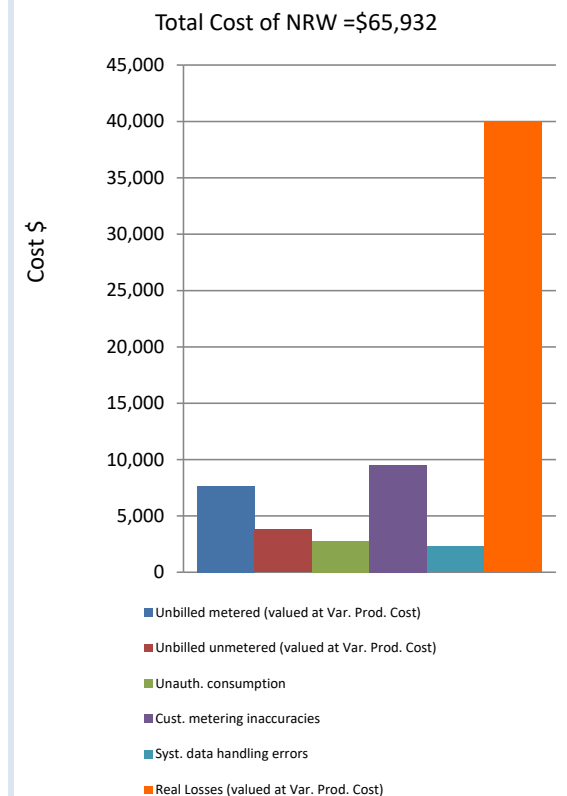
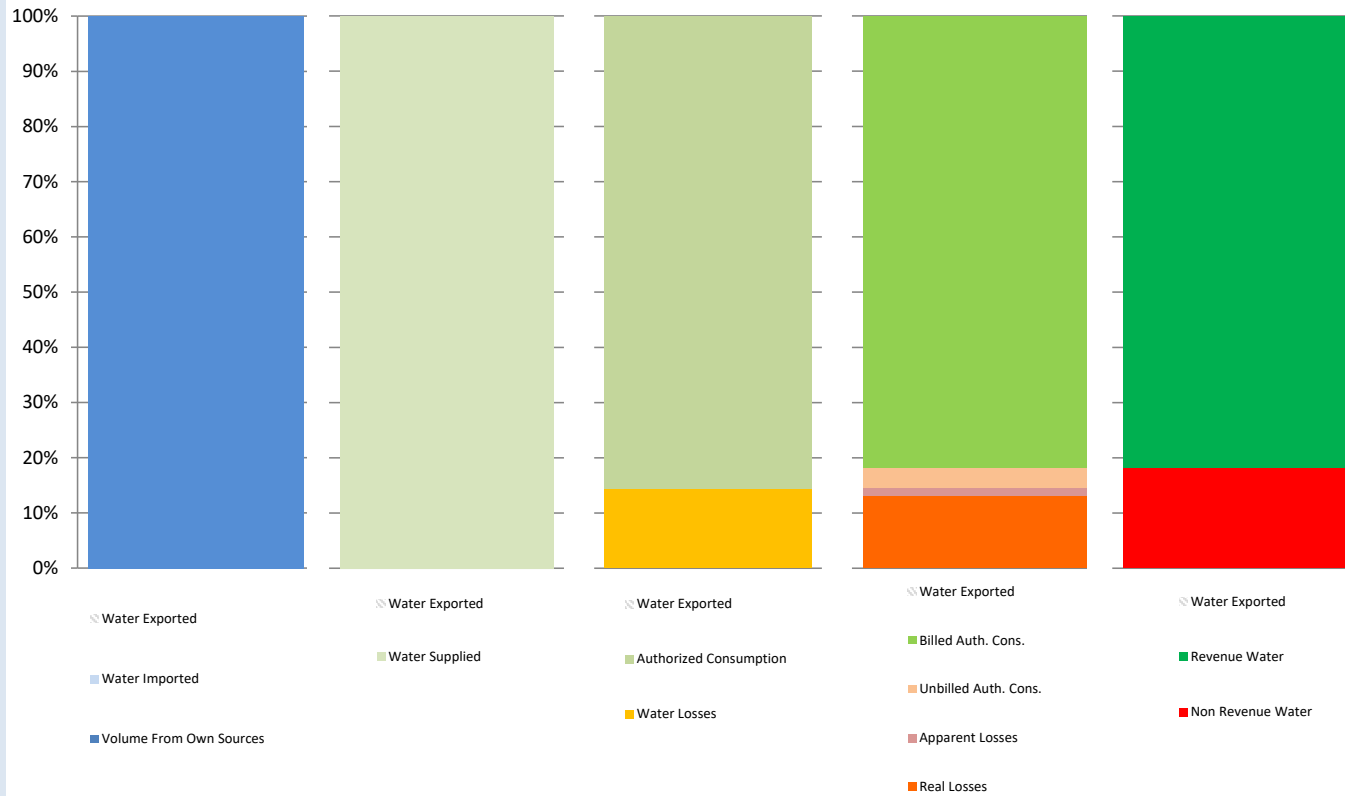
The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

Water Audit Report for: **Groveland Community Services District (CA5510009)**

Reporting Year: **2017**    **1/2017 - 12/2017**

Data Validity Score: **65**

- Show me the VOLUME of Non-Revenue Water
- Show me the COST of Non-Revenue Water





# AWWA Free Water Audit Software: Grading Matrix

WAS 5.0

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The grading assigned to each audit component and the corresponding recommended improvements and actions are highlighted in yellow. Audit accuracy is likely to be improved by prioritizing those items shown in red

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
<b>WATER SUPPLIED</b>											
<b>Volume from own sources:</b>	Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.	25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.	Conditions between 2 and 4	50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.	Conditions between 4 and 6	At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Volume from own Sources" component:		<u>to qualify for 2:</u> Organize and launch efforts to collect data for determining volume from own sources	<u>to qualify for 4:</u> Locate all water production sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered water production sources and replace any obsolete/defective meters.		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all source meters; specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/defective meters.		<u>to qualify for 8:</u> Conduct annual meter accuracy testing and calibration of related instrumentation on all meter installations on a regular basis. Complete project to install new, or replace defective existing, meters so that entire production meter population is metered. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing and calibration of related instrumentation for all meter installations. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to further improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Volume from own sources master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its sources of supply	Inventory information on meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined	No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system; tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.	Conditions between 2 and 4	Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include estimate of daily changes in tanks/storage facilities. Meter data is adjusted when gross data errors occur, or occasional meter testing deems this necessary.	Conditions between 4 and 6	Hourly production meter data logged automatically & reviewed on at least a weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and/or error is confirmed by meter accuracy testing. Tank/storage facility elevation changes are automatically used in calculating a balanced "Volume from own sources" component, and data gaps in the archived data are corrected on at least a weekly basis.	Conditions between 6 and 8	Continuous production meter data is logged automatically & reviewed each business day. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Tank/storage facility elevation changes are automatically used in "Volume from own sources" tabulations and data gaps in the archived data are corrected on a daily basis.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically balances flows from all sources and storages; results are reviewed each business day. Tight accountability controls ensure that all data gaps that occur in the archived flow data are quickly detected and corrected. Regular calibrations between SCADA and sources meters ensures minimal data transfer error.
Improvements to attain higher data grading for "Master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature.	<u>to qualify for 4:</u> Install automatic datalogging equipment on production meters. Complete installation of level instrumentation at all tanks/storage facilities and include tank level data in automatic calculation routine in a computerized system. Construct a computerized listing or spreadsheet to archive input volumes, tank/storage volume changes and import/export flows in order to determine the composite "Water Supplied" volume for the distribution system. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps.		<u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly production meter data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Use daily net storage change to balance flows in calculating "Water Supplied" volume. Necessary corrections to data errors are implemented on a weekly basis.		<u>to qualify for 8:</u> Ensure that all flow data is collected and archived on at least an hourly basis. All data is reviewed and detected errors corrected each business day. Tank/storage levels variations are employed in calculating balanced "Water Supplied" component. Adjust production meter data for gross error and inaccuracy confirmed by testing.		<u>to qualify for 10:</u> Link all production and tank/storage facility elevation change data to a Supervisory Control & Data Acquisition (SCADA) System, or similar computerized monitoring/control system, and establish automatic flow balancing algorithm and regularly calibrate between SCADA and source meters. Data is reviewed and corrected each business day.		<u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters. Continue to replace or repair meters as they perform outside of desired accuracy limits. Stay abreast of new and more accurate water level instruments to better record tank/storage levels and archive the variations in storage volume. Keep current with SCADA and data management systems to ensure that archived data is well-managed and error free.
Water Imported:	Select n/a if the water utility's supply is exclusively from its own water resources (no bulk purchased/ imported water)	Less than 25% of imported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of imported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of imported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of imported water sources are metered, meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually for all meter installations. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Imported Volume" component:  <i>(Note: usually the water supplier selling the water - "the Exporter" - to the utility being audited is responsible to maintain the metering installation measuring the imported volume. The utility should coordinate carefully with the Exporter to ensure that adequate meter upkeep takes place and an accurate measure of the Water Imported volume is quantified.)</i>		<u>to qualify for 2:</u> Review bulk water purchase agreements with partner suppliers; confirm requirements for use and maintenance of accurate metering. Identify needs for new or replacement meters with goal to meter all imported water sources.	<u>To qualify for 4:</u> Locate all imported water sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered imported water interconnections and replace obsolete/defective meters.		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all imported water meters, planning for both regular meter accuracy testing and calibration of the related instrumentation. Continue installation of meters on unmetered imported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8:</u> Complete project to install new, or replace defective, meters on all imported water interconnections. Maintain annual meter accuracy testing for all imported water meters and conduct calibration of related instrumentation at least annually. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Continue to conduct calibration of related instrumentation on a semi-annual basis. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Water imported master meter and supply error adjustment:	Select n/a if the Imported water supply is unmetred, with Imported water quantities estimated on the billing invoices sent by the Exporter to the purchasing Utility.	Inventory information on imported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with water Exporter(s) are missing or written in vague language concerning meter management and testing.	No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Imported supply metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis by the Exporter with necessary corrections implemented. Meter data is adjusted by the Exporter when gross data errors are detected. A coherent data trail exists for this process to protect both the selling and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly Imported supply metered data is logged automatically & reviewed on at least a weekly basis by the Exporter. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error confirmed by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling and the purchasing Utility.	Conditions between 6 and 8	Continuous Imported supply metered flow data is logged automatically & reviewed each business day by the Exporter. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the Exporter. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water imported master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the selling and purchasing Utility.	<u>to qualify for 4:</u> Install automatic datalogging equipment on Imported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the Exporters to jointly review terms of the written agreements regarding meter accuracy testing and data management, revise the terms as necessary.		<u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly Imported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		<u>to qualify for 8:</u> Ensure that all Imported supply metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		<u>to qualify for 10:</u> Conduct accountability checks to confirm that all Imported supply metered data is reviewed and corrected each business day by the Exporter. Results of all meter accuracy tests and data corrections should be available for sharing between the Exporter and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreement between the selling and the purchasing Utility; at least every five years.		<u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the Exporter to help identify meter replacement needs. Keep communication lines with Exporters open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
Water Exported:	Select n/a if the water utility sells no bulk water to neighboring water utilities (no exported water sales)	Less than 25% of exported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of exported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of exported water sources are metered, meter accuracy testing and/or electronic calibration conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy.	Conditions between 8 and 10	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Exported Volume" component:  <i>(Note: usually, if the water utility being audited sells (Exports) water to a neighboring purchasing Utility, it is the responsibility of the utility exporting the water to maintain the metering installation measuring the Exported volume. The utility exporting the water should ensure that adequate meter upkeep takes place and an accurate measure of the Water Exported volume is quantified.)</i>		<u>to qualify for 2:</u> Review bulk water sales agreements with purchasing utilities; confirm requirements for use & upkeep of accurate metering. Identify needs to install new, or replace defective meters as needed.	<u>To qualify for 4:</u> Locate all exported water sources on maps and in field, launch meter accuracy testing for existing meters, begin to install meters on unmetred exported water interconnections and replace obsolete/defective meters		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all exported water meters. Continue installation of meters on unmetred exported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8:</u> Complete project to install new, or replace defective, meters on all exported water interconnections. Maintain annual meter accuracy testing for all exported water meters. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing for all meters. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Water exported master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its exported supply interconnections.	Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.	No automatic datalogging of exported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Exported metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. Meter data is adjusted by the utility selling (exporting) the water when gross data errors are detected. A coherent data trail exists for this process to protect both the utility exporting the water and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly exported supply metered data is logged automatically & reviewed on at least a weekly basis by the utility selling the water. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error found by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling (exporting) utility and the purchasing Utility.	Conditions between 6 and 8	Continuous exported supply metered flow data is logged automatically & reviewed each business day by the utility selling (exporting) the water. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and any error confirmed by meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling (exporting) Utility and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the utility selling (exporting) the water. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling Utility and purchasing Utility at least once every five years.



Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Water exported master meter and supply error adjustment" component.		<p><u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the utility selling (exporting) the water and the purchasing Utility.</p>	<p><u>to qualify for 4:</u> Install automatic datalogging equipment on exported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the purchasing utilities to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.</p>		<p><u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly exported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.</p>		<p><u>to qualify for 8:</u> Ensure that all exported metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.</p>		<p><u>to qualify for 10:</u> Conduct accountability checks to confirm that all exported metered flow data is reviewed and corrected each business day by the utility selling the water. Results of all meter accuracy tests and data corrections should be available for sharing between the utility and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreements with the purchasing utilities, at least every five years.</p>		<p><u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the purchasing utilities to help identify meter replacement needs. Keep communication lines with the purchasing utilities open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.</p>
<b>AUTHORIZED CONSUMPTION</b>											
Billed metered:	n/a (not applicable). Select n/a only if the entire customer population is not metered and is billed for water service on a flat or fixed rate basis. In such a case the volume entered must be zero.	Less than 50% of customers with volume-based billings from meter readings; flat or fixed rate billing exists for the majority of the customer population	At least 50% of customers with volume-based billing from meter reads; flat rate billing for others. Manual meter reading is conducted with less than 50% meter read success rate, remaining accounts consumption is estimated. Limited meter records, no regular meter testing or replacement. Billing data maintained on paper records, with no auditing.	Conditions between 2 and 4	At least 75% of customers with volume-based, billing from meter reads; flat or fixed rate billing for remaining accounts. Manual meter reading is conducted with at least 50% meter read success rate; consumption for accounts with failed reads is estimated. Purchase records verify age of customer meters; only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Conditions between 4 and 6	At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter records exist, but only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducted by utility personnel.	Conditions between 6 and 8	At least 97% of customers exist with volume-based billing from meter reads. At least 90% customer meter reading success rate; or at least 80% read success rate with planning and budgeting for trials of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) in one or more pilot areas. Good customer meter records. Regular meter accuracy testing guides replacement of statistically significant number of meters each year. Routine auditing of computerized billing records for global and detailed statistics occurs annually by utility personnel, and is verified by third party at least once every five years.	Conditions between 8 and 10	At least 99% of customers exist with volume-based billing from meter reads. At least 95% customer meter reading success rate; or minimum 80% meter reading success rate, with Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) trials underway. Statistically significant customer meter testing and replacement program in place on a continuous basis. Computerized billing with routine, detailed auditing, including field investigation of representative sample of accounts undertaken annually by utility personnel. Audit is conducted by third party auditors at least once every three years.
Improvements to attain higher data grading for "Billed Metered Consumption" component.	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	<p><u>to qualify for 2:</u> Conduct investigations or trials of customer meters to select appropriate meter models. Budget funding for meter installations. Investigate volume based water rate structures.</p>	<p><u>to qualify for 4:</u> Purchase and install meters on unmetered accounts. Implement policies to improve meter reading success. Catalog meter information during meter read visits to identify age/model of existing meters. Test a minimal number of meters for accuracy. Install computerized billing system.</p>		<p><u>to qualify for 6:</u> Purchase and install meters on unmetered accounts. Eliminate flat fee billing and establish appropriate water rate structure based upon measured consumption. Continue to achieve verifiable success in removing manual meter reading barriers. Expand meter accuracy testing. Launch regular meter replacement program. Launch a program of annual auditing of global billing statistics by utility personnel.</p>		<p><u>to qualify for 8:</u> Purchase and install meters on unmetered accounts. If customer meter reading success rate is less than 97%, assess cost-effectiveness of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system for portion or entire system; or otherwise achieve ongoing improvements in manual meter reading success rate to 97% or higher. Refine meter accuracy testing program. Set meter replacement goals based upon accuracy test results. Implement annual auditing of detailed billing records by utility personnel and implement third party auditing at least once every five years.</p>		<p><u>to qualify for 10:</u> Purchase and install meters on unmetered accounts. Launch Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system trials if manual meter reading success rate of at least 99% is not achieved within a five-year program. Continue meter accuracy testing program. Conduct planning and budgeting for large scale meter replacement based upon meter life cycle analysis using cumulative flow target. Continue annual detailed billing data auditing by utility personnel and conduct third party auditing at least once every three years.</p>		<p><u>to maintain 10:</u> Continue annual internal billing data auditing, and third party auditing at least every three years. Continue customer meter accuracy testing to ensure that accurate customer meter readings are obtained and entered as the basis for volume based billing. Stay abreast of improvements in Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) and information management. Plan and budget for justified upgrades in metering, meter reading and billing data management to maintain very high accuracy in customer metering and billing.</p>
Billed unmetered:	Select n/a if it is the policy of the water utility to meter all customer connections and it has been confirmed by detailed auditing that all customers do indeed have a water meter, i.e. no intentionally unmetered accounts exist	Water utility policy does not require customer metering; flat or fixed fee billing is employed. No data is collected on customer consumption. The only estimates of customer population consumption available are derived from data estimation methods using average fixture count multiplied by number of connections, or similar approach.	Water utility policy does not require customer metering; flat or fixed fee billing is employed. Some metered accounts exist in parts of the system (pilot areas or District Metered Areas) with consumption read periodically or recorded on portable dataloggers over one, three, or seven day periods. Data from these sample meters are used to infer consumption for the total customer population. Site specific estimation methods are used for unusual buildings/water uses.	Conditions between 2 and 4	Water utility policy does require metering and volume based billing in general. However, a liberal amount of exemptions and a lack of clearly written and communicated procedures result in up to 20% of billed accounts believed to be unmetered by exemption; or the water utility is in transition to becoming fully metered, and a large number of customers remain unmetered. A rough estimate of the annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 4 and 6	Water utility policy does require metering and volume based billing but established exemptions exist for a portion of accounts such as municipal buildings. As many as 15% of billed accounts are unmetered due to this exemption or meter installation difficulties. Only a group estimate of annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 6 and 8	Water utility policy does require metering and volume based billing for all customer accounts. However, less than 5% of billed accounts remain unmetered because meter installation is hindered by unusual circumstances. The goal is to minimize the number of unmetered accounts. Reliable estimates of consumption are obtained for these unmetered accounts via site specific estimation methods.	Conditions between 8 and 10	Water utility policy does require metering and volume based billing for all customer accounts. Less than 2% of billed accounts are unmetered and exist because meter installation is hindered by unusual circumstances. The goal exists to minimize the number of unmetered accounts to the extent that is economical. Reliable estimates of consumption are obtained at these accounts via site specific estimation methods.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Billed Unmetered Consumption" component:		<p><u>to qualify for 2:</u> Conduct research and evaluate cost/benefit of a new water utility policy to require metering of the customer population; thereby greatly reducing or eliminating unmetered accounts. Conduct pilot metering project by installing water meters in small sample of customer accounts and periodically reading the meters or datalogging the water consumption over one, three, or seven day periods.</p>	<p><u>to qualify for 4:</u> Implement a new water utility policy requiring customer metering. Launch or expand pilot metering study to include several different meter types, which will provide data for economic assessment of full scale metering options. Assess sites with access difficulties to devise means to obtain water consumption volumes. Begin customer meter installation.</p>		<p><u>to qualify for 6:</u> Refine policy and procedures to improve customer metering participation for all but solidly exempt accounts. Assign staff resources to review billing records to identify errant unmetered properties. Specify metering needs and funding requirements to install sufficient meters to significantly reduce the number of unmetered accounts</p>		<p><u>to qualify for 8:</u> Push to install customer meters on a full scale basis. Refine metering policy and procedures to ensure that all accounts, including municipal properties, are designated for meters. Plan special efforts to address "hard-to-access" accounts. Implement procedures to obtain a reliable consumption estimate for the remaining few unmetered accounts awaiting meter installation.</p>		<p><u>to qualify for 10:</u> Continue customer meter installation throughout the service area, with a goal to minimize unmetered accounts. Sustain the effort to investigate accounts with access difficulties, and devise means to install water meters or otherwise measure water consumption.</p>		<p><u>to maintain 10:</u> Continue to refine estimation methods for unmetered consumption and explore means to establish metering, for as many billed remaining unmetered accounts as is economically feasible.</p>
Unbilled metered:	select n/a if all billing-exempt consumption is unmetered.	<p>Billing practices exempt certain accounts, such as municipal buildings, but written policies do not exist, and a reliable count of unbilled metered accounts is unavailable. Meter upkeep and meter reading on these accounts is rare and not considered a priority. Due to poor recordkeeping and lack of auditing, water consumption for all such accounts is purely guesstimated.</p>	<p>Billing practices exempt certain accounts, such as municipal buildings, but only scattered, dated written directives exist to justify this practice. A reliable count of unbilled metered accounts is unavailable. Sporadic meter replacement and meter reading occurs on an as-needed basis. The total annual water consumption for all unbilled, metered accounts is estimated based upon approximating the number of accounts and assigning consumption from actively billed accounts of same meter size.</p>	Conditions between 2 and 4	<p>Dated written procedures permit billing exemption for specific accounts, such as municipal properties, but are unclear regarding certain other types of accounts. Meter reading is given low priority and is sporadic. Consumption is quantified from meter readings where available. The total number of unbilled, unmetered accounts must be estimated along with consumption volumes.</p>	Conditions between 4 and 6	<p>Written policies regarding billing exemptions exist but adherence in practice is questionable. Metering and meter reading for municipal buildings is reliable but sporadic for other unbilled metered accounts. Periodic auditing of such accounts is conducted. Water consumption is quantified directly from meter readings where available, but the majority of the consumption is estimated.</p>	Conditions between 6 and 8	<p>Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.</p>	Conditions between 8 and 10	<p>Clearly written policy identifies the types of accounts given a billing exemption, with emphasis on keeping such accounts to a minimum. Customer meter management and meter reading for these accounts is given proper priority and is reliably conducted. Regular auditing confirms this. Total water consumption for these accounts is taken from reliable readings from accurate meters.</p>
Improvements to attain higher data grading for "Unbilled Metered Consumption" component:		<p><u>to qualify for 2:</u> Reassess the water utility's policy allowing certain accounts to be granted a billing exemption. Draft an outline of a new written policy for billing exemptions, with clear justification as to why any accounts should be exempt from billing, and with the intention to keep the number of such accounts to a minimum.</p>	<p><u>to qualify for 4:</u> Review historic written directives and policy documents allowing certain accounts to be billing-exempt. Draft an outline of a written policy for billing exemptions, identify criteria that grants an exemption, with a goal of keeping this number of accounts to a minimum. Consider increasing the priority of reading meters on unbilled accounts at least annually.</p>		<p><u>to qualify for 6:</u> Draft a new written policy regarding billing exemptions based upon consensus criteria allowing this occurrence. Assign resources to audit meter records and billing records to obtain census of unbilled metered accounts. Gradually include a greater number of these metered accounts to the routes for regular meter reading.</p>		<p><u>to qualify for 8:</u> Communicate billing exemption policy throughout the organization and implement procedures that ensure proper account management. Conduct inspections of accounts confirmed in unbilled metered status and verify that accurate meters exist and are scheduled for routine meter readings. Gradually increase the number of unbilled metered accounts that are included in regular meter reading routes.</p>		<p><u>to qualify for 10:</u> Ensure that meter management (meter accuracy testing, meter replacement) and meter reading activities for unbilled accounts are accorded the same priority as billed accounts. Establish ongoing annual auditing process to ensure that water consumption is reliably collected and provided to the annual water audit process.</p>		<p><u>to maintain 10:</u> Reassess the utility's philosophy in allowing any water uses to go "unbilled". It is possible to meter and bill all accounts, even if the fee charged for water consumption is discounted or waived. Metering and billing all accounts ensures that water consumption is tracked and water waste from plumbing leaks is detected and minimized.</p>
Unbilled unmetered:		<p>Extent of unbilled, unmetered consumption is unknown due to unclear policies and poor recordkeeping. Total consumption is quantified based upon a purely subjective estimate.</p>	<p>Clear extent of unbilled, unmetered consumption is unknown, but a number of events are randomly documented each year, confirming existence of such consumption, but without sufficient documentation to quantify an accurate estimate of the annual volume consumed.</p>	Conditions between 2 and 4	<p>Extent of unbilled, unmetered consumption is partially known, and procedures exist to document certain events such as miscellaneous fire hydrant uses. Formulae is used to quantify the consumption from such events (time running multiplied by typical flowrate, multiplied by number of events).</p>	Default value of 1.25% of system input volume is employed	<p>Coherent policies exist for some forms of unbilled, unmetered consumption but others await closer evaluation. Reasonable recordkeeping for the managed uses exists and allows for annual volumes to be quantified by inference, but unsupervised uses are guesstimated.</p>	Conditions between 6 and 8	<p>Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events) or temporary meters, and relatively subjective estimates of less regulated use.</p>	Conditions between 8 and 10	<p>Clear policies exist to identify permitted use of water in unbilled, unmetered fashion, with the intention of minimizing this type of consumption. Good records document each occurrence and consumption is quantified via formulae (time running multiplied by typical flow, multiplied by number of events) or use of temporary meters.</p>
Improvements to attain higher data grading for "Unbilled Unmetered Consumption" component:		<p><u>to qualify for 5:</u> Utilize the accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use.</p> <p><u>to qualify for 2:</u> Establish a policy regarding what water uses should be allowed to remain as unbilled and unmetered. Consider tracking a small sample of one such use (ex: fire hydrant flushings).</p>	<p><u>to qualify for 5:</u> Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use.</p> <p><u>to qualify for 4:</u> Evaluate the documentation of events that have been observed. Meet with user groups (ex: for fire hydrants - fire departments, contractors to ascertain their need and/or volume requirements for water from fire hydrants).</p>		<p><u>to qualify for 5:</u> Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process, and should focus on other components since the volume of unbilled, unmetered consumption is usually a relatively small quantity component, and other larger-quantity components should take priority.</p>	<p><u>to qualify for 6 or greater:</u> Finalize policy and begin to conduct field checks to better establish and quantify such usage. Proceed if top-down audit exists and/or a great volume of such use is suspected.</p>	<p><u>to qualify for 8:</u> Assess water utility policy and procedures for various unmetered usages. For example, ensure that a policy exists and permits are issued for use of fire hydrants by persons outside of the utility. Create written procedures for use and documentation of fire hydrants by water utility personnel. Use same approach for other types of unbilled, unmetered water usage.</p>		<p><u>to qualify for 10:</u> Refine written procedures to ensure that all uses of unbilled, unmetered water are overseen by a structured permitting process managed by water utility personnel. Reassess policy to determine if some of these uses have value in being converted to billed and/or metered status.</p>		<p><u>to maintain 10:</u> Continue to refine policy and procedures with intention of reducing the number of allowable uses of water in unbilled and unmetered fashion. Any uses that can feasibly become billed and metered should be converted eventually.</p>

APPARENT LOSSES

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Unauthorized consumption:		Extent of unauthorized consumption is unknown due to unclear policies and poor recordkeeping. Total unauthorized consumption is guesstimated.	Unauthorized consumption is a known occurrence, but its extent is a mystery. There are no requirements to document observed events, but periodic field reports capture some of these occurrences. Total unauthorized consumption is approximated from this limited data.	conditions between 2 and 4	Procedures exist to document some unauthorized consumption such as observed unauthorized fire hydrant openings. Use formulae to quantify this consumption (time running multiplied typical flowrate, multiplied by number of events).	Default value of 0.25% of volume of water supplied is employed	Coherent policies exist for some forms of unauthorized consumption (more than simply fire hydrant misuse) but others await closer evaluation. Reasonable surveillance and recordkeeping exist for occurrences that fall under the policy. Volumes quantified by inference from these records.	Conditions between 6 and 8	Clear policies and good auditable recordkeeping exist for certain events (ex: tampering with water meters, illegal bypasses of customer meters); but other occurrences have limited oversight. Total consumption is a combination of volumes from formulae (time x typical flow) and subjective estimates of unconfirmed consumption.	Conditions between 8 and 10	Clear policies exist to identify all known unauthorized uses of water. Staff and procedures exist to provide enforcement of policies and detect violations. Each occurrence is recorded and quantified via formulae (estimated time running multiplied by typical flow) or similar methods. All records and calculations should exist in a form that can be audited by a third party.
Improvements to attain higher data grading for "Unauthorized Consumption" component:		to qualify for 5: Use accepted default of 0.25% of volume of water supplied. to qualify for 2: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)	to qualify for 5: Use accepted default of 0.25% of system input volume to qualify for 4: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)		to qualify for 5: Utilize accepted default value of 0.25% of volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process.	to qualify for 6 or greater: Finalize policy updates to clearly identify the types of water consumption that are authorized from those usages that fall outside of this policy and are, therefore, unauthorized. Begin to conduct regular field checks. Proceed if the top-down audit already exists and/or a great volume of such use is suspected.	to qualify for 8: Assess water utility policies to ensure that all known occurrences of unauthorized consumption are outlawed, and that appropriate penalties are prescribed. Create written procedures for detection and documentation of various occurrences of unauthorized consumption as they are uncovered.		to qualify for 10: Refine written procedures and assign staff to seek out likely occurrences of unauthorized consumption. Explore new locking devices, monitors and other technologies designed to detect and thwart unauthorized consumption.		to maintain 10: Continue to refine policy and procedures to eliminate any loopholes that allow or tacitly encourage unauthorized consumption. Continue to be vigilant in detection, documentation and enforcement efforts.
Customer metering inaccuracies:	select n/a only if the entire customer population is unmetered. In such a case the volume entered must be zero.	Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is guesstimated.	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Conditions between 2 and 4	Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than just customer requests, but less than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.	Conditions between 4 and 6	A reliable electronic recordkeeping system for meters exists. The meter population includes a mix of new high performing meters and dated meters with suspect accuracy. Routine, but limited, meter accuracy testing and meter replacement occur. Inaccuracy volume is quantified using a mix of reliable and less certain data.	Conditions between 6 and 8	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for various types of meters.	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for these meters.	Good records of all active customer meters exist and include as a minimum: meter number, account number/location, type, size and manufacturer. Ongoing meter replacement occurs according to a targeted and justified basis. Regular meter accuracy testing gives a reliable measure of composite inaccuracy volume for the customer meter population. New metering technology is embraced to keep overall accuracy improving. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Customer meter inaccuracy volume" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.	to qualify for 4: Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.		to qualify for 6: Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.		to qualify for 8: Expand annual meter accuracy testing to evaluate a statistically significant number of meter makes/models. Expand meter replacement program to replace statistically significant number of poor performing meters each year.		to qualify for 9: Continue efforts to manage meter population with reliable recordkeeping. Test a statistically significant number of meters each year and analyze test results in an ongoing manner to serve as a basis for a target meter replacement strategy based upon accumulated volume throughput.	to qualify for 10: Continue efforts to manage meter population with reliable recordkeeping, meter testing and replacement. Evaluate new meter types and install one or more types in 5-10 customer accounts each year in order to pilot improving metering technology.	to maintain 10: Increase the number of meters tested and replaced as justified by meter accuracy test data. Continually monitor development of new metering technology and Advanced Metering Infrastructure (AMI) to grasp opportunities for greater accuracy in metering of water flow and management of customer consumption data.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Systematic Data Handling Errors:	Note: all water utilities incur some amount of this error. Even in water utilities with unmetred customer populations and fixed rate billing, errors occur in annual billing tabulations. Enter a positive value for the volume and select a grading.	Policies and procedures for activation of new customer water billing accounts are vague and lack accountability. Billing data is maintained on paper records which are not well organized. No auditing is conducted to confirm billing data handling efficiency. An unknown number of customers escape routine billing due to lack of billing process oversight.	Policy and procedures for activation of new customer accounts and oversight of billing records exist but need refinement. Billing data is maintained on paper records or insufficiently capable electronic database. Only periodic unstructured auditing work is conducted to confirm billing data handling efficiency. The volume of unbilled water due to billing lapses is a guess.	Conditions between 2 and 4	Policy and procedures for new account activation and oversight of billing operations exist but needs refinement. Computerized billing system exists, but is dated or lacks needed functionality. Periodic, limited internal audits conducted and confirm with approximate accuracy the consumption volumes lost to billing lapses.	Conditions between 4 and 6	Policy and procedures for new account activation and oversight of billing operations is adequate and reviewed periodically. Computerized billing system is in use with basic reporting available. Any effect of billing adjustments on measured consumption volumes is well understood. Internal checks of billing data error conducted annually. Reasonably accurate quantification of consumption volume lost to billing lapses is obtained.	Conditions between 6 and 8	New account activation and billing operations policy and procedures are reviewed at least biannually. Computerized billing system includes an array of reports to confirm billing data and system functionality. Checks are conducted routinely to flag and explain zero consumption accounts. Annual internal checks conducted with third party audit conducted at least once every five years. Accountability checks flag billing lapses. Consumption lost to billing lapses is well quantified and reducing year-by-year.	Conditions between 8 and 10	Sound written policy and procedures exist for new account activation and oversight of customer billing operations. Robust computerized billing system gives high functionality and reporting capabilities which are utilized, analyzed and the results reported each billing cycle. Assessment of policy and data handling errors are conducted internally and audited by third party at least once every three years, ensuring consumption lost to billing lapses is minimized and detected as it occurs.
Improvements to attain higher data grading for "Systematic Data Handling Error volume" component:		to qualify for 2: Draft written policy and procedures for activating new water billing accounts and oversight of billing operations. Investigate and budget for computerized customer billing system. Conduct initial audit of billing records by flow-charting the basic business processes of the customer account/billing function.	to qualify for 4: Finalize written policy and procedures for activation of new billing accounts and overall billing operations management. Implement a computerized customer billing system. Conduct initial audit of billing records as part of this process.		to qualify for 6: Refine new account activation and billing operations procedures and ensure consistency with the utility policy regarding billing, and minimize opportunity for missed billings. Upgrade or replace customer billing system for needed functionality - ensure that billing adjustments don't corrupt the value of consumption volumes. Procedurize internal annual audit process.		to qualify for 8: Formalize regular review of new account activation process and general billing practices. Enhance reporting capability of computerized billing system. Formalize regular auditing process to reveal scope of data handling error. Plan for periodic third party audit to occur at least once every five years.		to qualify for 10: Close policy/procedure loopholes that allow some customer accounts to go unbilled, or data handling errors to exist. Ensure that billing system reports are utilized, analyzed and reported every billing cycle. Ensure that internal and third party audits are conducted at least once every three years.		to maintain 10: Stay abreast of customer information management developments and innovations. Monitor developments of Advanced Metering Infrastructure (AMI) and integrate technology to ensure that customer endpoint information is well-monitored and errors/lapses are at an economic minimum.
<b>SYSTEM DATA</b>											
Length of mains:		Poorly assembled and maintained paper as-built records of existing water main installations makes accurate determination of system pipe length impossible. Length of mains is guesstimated.	Paper records in poor or uncertain condition (no annual tracking of installations & abandonments). Poor procedures to ensure that new water mains installed by developers are accurately documented.	Conditions between 2 and 4	Sound written policy and procedures exist for documenting new water main installations, but gaps in management result in a uncertain degree of error in tabulation of mains length.	Conditions between 4 and 6	Sound written policy and procedures exist for permitting and commissioning new water mains. Highly accurate paper records with regular field validation; or electronic records and asset management system in good condition. Includes system backup.	Conditions between 6 and 8	Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographic Information System (GIS) and asset management system are used to store and manage data.	Conditions between 8 and 10	Sound written policy exists for managing water mains extensions and replacements. Geographic Information System (GIS) data and asset management database agree and random field validation proves truth of databases. Records of annual field validation should be available for review.
Improvements to attain higher data grading for "Length of Water Mains" component:		to qualify for 2: Assign personnel to inventory current as-built records and compare with customer billing system records and highway plans in order to verify poorly documented pipelines. Assemble policy documents regarding permitting and documentation of water main installations by the utility and building developers; identify gaps in procedures that result in poor documentation of new water main installations.	to qualify for 4: Complete inventory of paper records of water main installations for several years prior to audit year. Review policy and procedures for commissioning and documenting new water main installation.		to qualify for 6: Finalize updates/improvements to written policy and procedures for permitting/commissioning new main installations. Confirm inventory of records for five years prior to audit year; correct any errors or omissions.		to qualify for 8: Launch random field checks of limited number of locations. Convert to electronic database such as a Geographic Information System (GIS) with backup as justified. Develop written policy and procedures.		to qualify for 10: Link Geographic Information System (GIS) and asset management databases, conduct field verification of data. Record field verification information at least annually.		to maintain 10: Continue with standardization and random field validation to improve the completeness and accuracy of the system.
Number of active AND inactive service connections:		Vague permitting (of new service connections) policy and poor paper recordkeeping of customer connections/billings result in suspect determination of the number of service connections, which may be 10-15% in error from actual count.	General permitting policy exists but paper records, procedural gaps, and weak oversight result in questionable total for number of connections, which may vary 5-10% of actual count.	Conditions between 2 and 4	Written account activation policy and procedures exist, but with some gaps in performance and oversight. Computerized information management system is being brought online to replace dated paper recordkeeping system. Reasonably accurate tracking of service connection installations & abandonments; but count can be up to 5% in error from actual total.	Conditions between 4 and 6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Conditions between 6 and 8	Policies and procedures for new account activation and overall billing operations are written, well-structured and reviewed at least biannually. Well-managed computerized information management system exists and routine, periodic field checks and internal system audits are conducted. Counts of connections are no more than 2% in error.	Conditions between 8 and 10	Sound written policy and well managed and audited procedures ensure reliable management of service connection population. Computerized information management system, Customer Billing System, and Geographic Information System (GIS) information agree; field validation proves truth of databases. Count of connections recorded as being in error is less than 1% of the entire population.
Improvements to attain higher data grading for "Number of Active and Inactive Service Connections" component:	Note: The number of Service Connections does not include fire hydrant leads/lines connecting the hydrant to the water main	to qualify for 2: Draft new policy and procedures for new account activation and overall billing operations. Research and collect paper records of installations & abandonments for several years prior to audit year.	to qualify for 4: Refine policy and procedures for new account activation and overall billing operations. Research computerized recordkeeping system (Customer Information System or Customer Billing System) to improve documentation format for service connections.		to qualify for 6: Refine procedures to ensure consistency with new account activation and overall billing policy to establish new service connections or decommission existing connections. Improve process to include all totals for at least five years prior to audit year.		to qualify for 8: Formalize regular review of new account activation and overall billing operations policies and procedures. Launch random field checks of limited number of locations. Develop reports and auditing mechanisms for computerized information management system.		to qualify for 10: Close any procedural loopholes that allow installations to go undocumented. Link computerized information management system with Geographic Information System (GIS) and formalize field inspection and information system auditing processes. Documentation of new or decommissioned service connections encounters several levels of checks and balances.		to maintain 10: Continue with standardization and random field validation to improve knowledge of system.
	Note: if customer water	Gradings 1-9 apply if customer properties are unmetred, if customer meters exist and are located inside the customer building premises, or if the water utility owns and is responsible for the entire service connection piping from the water main to the customer building. In any of these cases the average distance between the curb stop or boundary separating utility/customer responsibility for service connection piping, and the typical first point of use (ex: faucet) or the customer meter must be quantified. Gradings of 1-9 are used to grade the validity of the means to quantify this value. (See the "Service Connection Diagram" worksheet)									Either of two conditions can be met for a grading of 10:

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Average length of customer service line:	meters are located outside of the customer building next to the curb stop or boundary separating utility/customer responsibility, then the auditor should answer "Yes" to the question on the Reporting Worksheet asking about this. If the answer is Yes, the grading description listed under the Grading of 10(a) will be followed, with a value of zero automatically entered at a Grading of 10. See the Service Connection Diagram worksheet for a visual presentation of this distance.	Vague policy exists to define the delineation of water utility ownership and customer ownership of the service connection piping. Curb stops are perceived as the breakpoint but these have not been well-maintained or documented. Most are buried or obscured. Their location varies widely from site-to-site, and estimating this distance is arbitrary due to the unknown location of many curb stops.	Policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. The piping from the water main to the curb stop is the property of the water utility; and the piping from the curb stop to the customer building is owned by the customer. Curb stop locations are not well documented and the average distance is based upon a limited number of locations measured in the field.	Conditions between 2 and 4	Good policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. Curb stops are generally installed as needed and are reasonably documented. Their location varies widely from site-to-site, and an estimate of this distance is hindered by the availability of paper records of limited accuracy.	Conditions between 4 and 6	Clear written policy exists to define utility/customer responsibility for service connection piping. Accurate, well-maintained paper or basic electronic recordkeeping system exists. Periodic field checks confirm piping lengths for a sample of customer properties.	Conditions between 6 and 8	Clearly worded policy standardizes the location of curb stops and meters, which are inspected upon installation. Accurate and well maintained electronic records exist with periodic field checks to confirm locations of service lines, curb stops and customer meter pits. An accurate number of customer properties from the customer billing system allows for reliable averaging of this length.	Conditions between 8 and 10	a) Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer "Yes" to the question on the Reporting Working asking about this condition. A value of zero and a Grading of 10 are automatically entered in the Reporting Worksheet . b). Meters exist inside customer buildings, or properties are unmetered. In either case, answer "No" to the Reporting Worksheet question on meter location, and enter a distance determined by the auditor. For a Grading of 10 this value must be a very reliable number from a Geographic Information System (GIS) and confirmed by a statistically valid number of field checks.
Improvements to attain higher data grading for "Average Length of Customer Service Line" component:		<u>to qualify for 2:</u> Research and collect paper records of service line installations. Inspect several sites in the field using pipe locators to locate curb stops. Obtain the length of this small sample of connections in this manner.	<u>to qualify for 4:</u> Formalize and communicate policy delineating utility/customer responsibilities for service connection piping. Assess accuracy of paper records by field inspection of a small sample of service connections using pipe locators as needed. Research the potential migration to a computerized information management system to store service connection data.		<u>to qualify for 6:</u> Establish coherent procedures to ensure that policy for curb stop, meter installation and documentation is followed. Gain consensus within the water utility for the establishment of a computerized information management system.		<u>to qualify for 8:</u> Implement an electronic means of recordkeeping, typically via a customer information system, customer billing system, or Geographic Information System (GIS). Standardize the process to conduct field checks of a limited number of locations.		<u>to qualify for 10:</u> Link customer information management system and Geographic Information System (GIS), standardize process for field verification of data.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve knowledge of service connection configurations and customer meter locations.
Average operating pressure:		Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain, high system head loss and weak/erratic pressure controls further compromise the validity of the average pressure calculation.	Limited telemetry monitoring of scattered pumping station and water storage tank sites provides some static pressure data, which is recorded in handwritten logbooks. Pressure data is gathered at individual sites only when low pressure complaints arise. Average pressure is determined by averaging relatively crude data, and is affected by significant variation in ground elevations, system head loss and gaps in pressure controls in the distribution system.	Conditions between 2 and 4	Effective pressure controls separate different pressure zones; moderate pressure variation across the system; occasional open boundary valves are discovered that breach pressure zones. Basic telemetry monitoring of the distribution system logs pressure data electronically. Pressure data gathered by gauges or dataloggers at fire hydrants or buildings when low pressure complaints arise, and during fire flow tests and system flushing. Reliable topographical data exists. Average pressure is calculated using this mix of data.	Conditions between 4 and 6	Reliable pressure controls separate distinct pressure zones; only very occasional open boundary valves are encountered that breach pressure zones. Well-covered telemetry monitoring of the distribution system (not just pumping at source treatment plants or wells) logs extensive pressure data electronically. Pressure gathered by gauges/dataloggers at fire hydrants and buildings when low pressure complaints arise, and during fire flow tests and system flushing. Average pressure is determined by using this mix of reliable data.	Conditions between 6 and 8	Well-managed, discrete pressure zones exist with generally predictable pressure fluctuations. A current full-scale SCADA System or similar realtime monitoring system exists to monitor the water distribution system and collect data, including real time pressure readings at representative sites across the system. The average system pressure is determined from reliable monitoring system data.	Conditions between 8 and 10	Well-managed pressure districts/zones, SCADA System and hydraulic model exist to give very precise pressure data across the water distribution system. Average system pressure is reliably calculated from extensive, reliable, and cross-checked data. Calculations are reported on an annual basis as a minimum.
Improvements to attain higher data grading for "Average Operating Pressure" component:		<u>to qualify for 2:</u> Employ pressure gauging and/or datalogging equipment to obtain pressure measurements from fire hydrants. Locate accurate topographical maps of service area in order to confirm ground elevations. Research pump data sheets to find pump pressure/flow characteristics	<u>to qualify for 4:</u> Formalize a procedure to use pressure gauging/datalogging equipment to gather pressure data during various system events such as low pressure complaints, or operational testing. Gather pump pressure and flow data at different flow regimes. Identify faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) and plan to properly configure pressure zones. Make all pressure data from these efforts available to generate system-wide average pressure.		<u>to qualify for 6:</u> Expand the use of pressure gauging/datalogging equipment to gather scattered pressure data at a representative set of sites, based upon pressure zones or areas. Utilize pump pressure and flow data to determine supply head entering each pressure zone or district. Correct any faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) to ensure properly configured pressure zones. Use expanded pressure dataset from these activities to generate system-wide average pressure.		<u>to qualify for 8:</u> Install a Supervisory Control and Data Acquisition (SCADA) System, or similar realtime monitoring system, to monitor system parameters and control operations. Set regular calibration schedule for instrumentation to insure data accuracy. Obtain accurate topographical data and utilize pressure data gathered from field surveys to provide extensive, reliable data for pressure averaging.		<u>to qualify for 10:</u> Annually, obtain a system-wide average pressure value from the hydraulic model of the distribution system that has been calibrated via field measurements in the water distribution system and confirmed in comparisons with SCADA System data.		<u>to maintain 10:</u> Continue to refine the hydraulic model of the distribution system and consider linking it with SCADA System for realtime pressure data calibration, and averaging.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
<b>COST DATA</b>											
Total annual cost of operating water system:		Incomplete paper records and lack of financial accounting documentation on many operating functions makes calculation of water system operating costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to estimate the major portion of water system operating costs.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. However, gaps in data are known to exist, periodic internal reviews are conducted but not a structured financial audit.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited periodically by utility personnel, but not a Certified Public Accountant (CPA).	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited at least annually by utility personnel, and at least once every three years by third-party CPA.	Conditions between 8 and 10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.
Improvements to attain higher data grading for "Total Annual Cost of Operating the Water System" component:		<u>to qualify for 2:</u> Gather available records, institute new financial accounting procedures to regularly collect and audit basic cost data of most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Establish process for periodic internal audit of water system operating costs; identify cost data gaps and institute procedures for tracking these outstanding costs.		<u>to qualify for 8:</u> Standardize the process to conduct routine financial audit on an annual basis. Arrange for CPA audit of financial records at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and long-term cost trend, and budget/track costs proactively
Customer retail unit cost (applied to Apparent Losses):	Customer population unmetered, and/or only a fixed fee is charged for consumption.	Antiquated, cumbersome water rate structure is used, with periodic historic amendments that were poorly documented and implemented; resulting in classes of customers being billed inconsistent charges. The actual composite billing rate likely differs significantly from the published water rate structure, but a lack of auditing leaves the degree of error indeterminate.	Dated, cumbersome water rate structure, not always employed consistently in actual billing operations. The actual composite billing rate is known to differ from the published water rate structure, and a reasonably accurate estimate of the degree of error is determined, allowing a composite billing rate to be quantified.	Conditions between 2 and 4	Straight-forward water rate structure in use, but not updated in several years. Billing operations reliably employ the rate structure. The composite billing rate is derived from a single customer class such as residential customer accounts, neglecting the effect of different rates from varying customer classes.	Conditions between 4 and 6	Clearly written, up-to-date water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average residential rate using volumes of water in each rate block.	Conditions between 6 and 8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate, which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Conditions between 8 and 10	Current, effective water rate structure is in force and is applied reliably in billing operations. The rate structure and calculations of composite rate - which includes residential, commercial, industrial, institutional (CII), and other distinct customer classes - are reviewed by a third party knowledgeable in the M36 methodology at least once every five years.
Improvements to attain higher data grading for "Customer Retail Unit Cost" component:		<u>to qualify for 2:</u> Formalize the process to implement water rates, including a secure documentation procedure. Create a current, formal water rate document and gain approval from all stakeholders.	<u>to qualify for 4:</u> Review the water rate structure and update/formalize as needed. Assess billing operations to ensure that actual billing operations incorporate the established water rate structure.		<u>to qualify for 6:</u> Evaluate volume of water used in each usage block by residential users. Multiply volumes by full rate structure.	<u>Launch effort to fully meter the customer population and charge rates based upon water volumes</u>	<u>to qualify for 8:</u> Evaluate volume of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to qualify for 10:</u> Conduct a periodic third-party audit of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to maintain 10:</u> Keep water rate structure current in addressing the water utility's revenue needs. Update the calculation of the customer unit rate as new rate components, customer classes, or other components are modified.
Variable production cost (applied to Real Losses):	Note: if the water utility purchases/imports its entire water supply, then enter the unit purchase cost of the bulk water supply in the Reporting Worksheet with a grading of 10	Incomplete paper records and lack of documentation on primary operating functions (electric power and treatment costs most importantly) makes calculation of variable production costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to roughly estimate the basic operations costs (pumping power costs and treatment costs) and calculate a unit variable production cost.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. Electric power and treatment costs are reliably tracked and allow accurate weighted calculation of unit variable production costs based on these two inputs and water imported purchase costs (if applicable). All costs are audited internally on a periodic basis.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent primary and secondary variable production and water imported purchase (if applicable) costs tracked. The data is audited at least annually by utility personnel, and at least once every three years by a third-party knowledgeable in the M36 methodology.	Conditions between 8 and 10	Either of two conditions can be met to obtain a grading of 10: 1) Third party CPA audit of all pertinent primary and secondary variable production and water imported purchase (if applicable) costs on an annual basis. or: 2) Water supply is entirely purchased as bulk water imported, and the unit purchase cost - including all applicable marginal supply costs - serves as the variable production cost. If all applicable marginal supply costs are not included in this figure, a grade of 10 should not be selected.
Improvements to attain higher data grading for "Variable Production Cost" component:		<u>to qualify for 2:</u> Gather available records, institute new procedures to regularly collect and audit basic cost data and most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Formalize process for regular internal audits of production costs. Assess whether additional costs (liability, residuals management, equipment wear, impending infrastructure expansion) should be included to calculate a more representative variable production cost.		<u>to qualify for 8:</u> Formalize the accounting process to include direct cost components (power, treatment) as well as indirect cost components (liability, residuals management, etc.) Arrange to conduct audits by a knowledgeable third-party at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and budget/track costs proactively



## AWWA Free Water Audit Software: Determining Water Loss Standing

WAS v5.0

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Water Audit Report for: **Groveland Community Services District (CA5510009)**

Reporting Year: **2017**    1/2017 - 12/2017

Data Validity Score: **65**

### Water Loss Control Planning Guide

Water Audit Data Validity Level / Score					
Functional Focus Area	Level I (0-25)	Level II (26-50)	Level III (51-70)	Level IV (71-90)	Level V (91-100)
Audit Data Collection	Launch auditing and loss control team; address production metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs. Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table)	Performance Benchmarking - ILI is meaningful in comparing real loss standing	Identify Best Practices/ Best in class - the ILI is very reliable as a real loss performance indicator for best in class service

*For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.*

Once data have been entered into the Reporting Worksheet, the performance indicators are automatically calculated. How does a water utility operator know how well his or her system is performing? The AWWA Water Loss Control Committee provided the following table to assist water utilities in gauging an approximate Infrastructure Leakage Index (ILI) that is appropriate for their water system and local conditions. The lower the amount of leakage and real losses that exist in the system, then the lower the ILI value will be.

**Note:** this table offers an approximate guideline for leakage reduction target-setting. The best means of setting such targets include performing an economic assessment of various loss control methods. However, this table is useful if such an assessment is not possible.

**General Guidelines for Setting a Target ILI  
(without doing a full economic analysis of leakage control options)**

Target ILI Range	Financial Considerations	Operational Considerations	Water Resources Considerations
1.0 - 3.0	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulation or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
>3.0 - 5.0	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions (leakage management, water conservation) are included in the long-term
>5.0 - 8.0	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
Greater than 8.0	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective utilization of water as a resource. Setting a target level greater than 8.0 - other than as an incremental goal to a smaller long-term target - is discouraged.		
Less than 1.0	If the calculated Infrastructure Leakage Index (ILI) value for your system is 1.0 or less, two possibilities exist. a) you are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control. b) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI value but do not employ extensive leakage control practices in your operations. In such cases it is beneficial to validate the data by performing field measurements to confirm the accuracy of production and customer meters, or to identify any other potential sources of error in the data.		



**VALIDATOR PROVIDED INFORMATION**

**Certified Validation Report**

**Audit Information**

Water Supplier Information: Groveland Community Services District

PWS ID: CA5510009

System Type: Potable

Audit Period: January - December 2018

Utility Representation: Luis Melchor, Operations Manager

Interview Time: December 4, 2019 at 2:00 PM

Validation Date: December 9, 2019

**Validation Findings & Confirmation Statement**

**Key Audit Metrics**

Data Validity Score: 64

Data Validity Band (Level): III (51-70)

ILI: 0.22

Real Loss: 8.358 MG/Yr

Non-Revenue Water as Percentage of Cost of Operating System: 1.7%

Apparent Loss: 1.629 MG/Yr

**Certification Statement By Validator**

This water loss audit report has been Level One (1) validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on the volume derivation and Data Validity Grades were incorporated into the water audit  
If not, rejected recommendations are included here:

**Validator Information**

Water Audit Validator: Angela Hall

Qualifications: Water Audit Validator Certificate issued by the CA-NV Section of the AWWA

**UTILITY PROVIDED INFORMATION**

Water Supplier Name: Groveland Community Services District

Water Supplier ID Number: CA5510009

Water Audit Period: January - December 2018

**Water Audit & Water Loss Improvement Steps:**

Utility to provide steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

GCSD will be installing a finished water meter that will collect water data from VOS prior to entering the water distribution system.

**Certification Statement by Utility Executive:**

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audit and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Name (Print)

Peter Kampa

Title

General Manager

Signature



Date

12-10-19

# AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

## Please begin by providing the following information

Name of Contact Person:

Email Address:

Telephone | Ext.:

Name of City / Utility:

City/Town/Municipality:

State / Province:

Country:

Year:

Audit Preparation Date:

Volume Reporting Units:

PWSID / Other ID:

## The following guidance will help you complete the Audit

All audit data are entered on the [Reporting Worksheet](#)

- 
 Value can be entered by user
- 
 Value calculated based on input data
- 
 These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt:  Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

<p><b><u>Instructions</u></b></p> <p>The current sheet. Enter contact information and basic audit details (year, units etc)</p>	<p><b><u>Reporting Worksheet</u></b></p> <p>Enter the required data on this worksheet to calculate the water balance and data grading</p>	<p><b><u>Comments</u></b></p> <p>Enter comments to explain how values were calculated or to document data sources</p>	<p><b><u>Performance Indicators</u></b></p> <p>Review the performance indicators to evaluate the results of the audit</p>	<p><b><u>Water Balance</u></b></p> <p>The values entered in the Reporting Worksheet are used to populate the Water Balance</p>	<p><b><u>Dashboard</u></b></p> <p>A graphical summary of the water balance and Non-Revenue Water components</p>
<p><b><u>Grading Matrix</u></b></p> <p>Presents the possible grading options for each input component of the audit</p>	<p><b><u>Service Connection Diagram</u></b></p> <p>Diagrams depicting possible customer service connection line configurations</p>	<p><b><u>Definitions</u></b></p> <p>Use this sheet to understand the terms used in the audit process</p>	<p><b><u>Loss Control Planning</u></b></p> <p>Use this sheet to interpret the results of the audit validity score and performance indicators</p>	<p><b><u>Example Audits</u></b></p> <p>Reporting Worksheet and Performance Indicators examples are shown for two validated audits</p>	<p><b><u>Acknowledgements</u></b></p> <p>Acknowledgements for the AWWA Free Water Audit Software v5.0</p>

If you have questions or comments regarding the software please contact us via email at: [wlc@awwa.org](mailto:wlc@awwa.org)



# AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

American Water Works Association

?	Click to access definition
+	Click to add a comment

**Water Audit Report for:** Groveland Community Services District (CA5510009)  
**Reporting Year:** 2018 / 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

**All volumes to be entered as: MILLION GALLONS (US) PER YEAR**

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

**WATER SUPPLIED**

	----- Enter grading in column 'E' and 'J' ----->	
Volume from own sources:	+ ? 7	117.930 MG/Yr
Water imported:	+ ? n/a	0.000 MG/Yr
Water exported:	+ ? n/a	0.000 MG/Yr

**Master Meter and Supply Error Adjustments**

	Pcmt:		Value:							
+ ?	2	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	MG/Yr
+ ?		<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	MG/Yr
+ ?		<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	MG/Yr

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

**WATER SUPPLIED: 117.930 MG/Yr**

**AUTHORIZED CONSUMPTION**

Billed metered:	+ ? 6	103.469 MG/Yr
Billed unmetered:	+ ? n/a	0.000 MG/Yr
Unbilled metered:	+ ? 7	3.000 MG/Yr
Unbilled unmetered:	+ ?	1.474 MG/Yr

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

**AUTHORIZED CONSUMPTION: 107.943 MG/Yr**

Click here: ? for help using option buttons below

	Pcmt:		Value:							
1.25%	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	MG/Yr

Use buttons to select percentage of water supplied  
**OR**  
value

**WATER LOSSES (Water Supplied - Authorized Consumption)**

**9.987 MG/Yr**

**Apparent Losses**

Unauthorized consumption:	+ ?	0.295 MG/Yr
---------------------------	-----	-------------

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

Customer metering inaccuracies:	+ ? 4	1.075 MG/Yr
Systematic data handling errors:	+ ?	0.259 MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

**Apparent Losses: 1.629 MG/Yr**

	Pcmt:		Value:							
0.25%	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	MG/Yr
1.00%	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	MG/Yr
0.25%	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	MG/Yr

**Real Losses (Current Annual Real Losses or CARL)**

Real Losses = Water Losses - Apparent Losses: ? **8.358 MG/Yr**

**WATER LOSSES: 9.987 MG/Yr**

**NON-REVENUE WATER**

**NON-REVENUE WATER: 14.461 MG/Yr**

= Water Losses + Unbilled Metered + Unbilled Unmetered

**SYSTEM DATA**

Length of mains:	+ ? 4	71.0 miles
Number of <u>active AND inactive</u> service connections:	+ ? 8	3,266
Service connection density:	?	46 conn./mile main

Are customer meters typically located at the curbside or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

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

Average operating pressure: + ? 4 120.0 psi

**COST DATA**

Total annual cost of operating water system:	+ ? 10	\$2,873,151	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ? 6	\$8.93	\$/1000 gallons (US)
Variable production cost (applied to Real Losses):	+ ? 5	\$2,756.00	\$/Million gallons <input type="checkbox"/> Use Customer Retail Unit Cost to value real losses

**WATER AUDIT DATA VALIDITY SCORE:**

**\*\*\* YOUR SCORE IS: 64 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: Customer metering inaccuracies
- 3: Billed metered



## AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.

Water Audit Report for: **Groveland Community Services District (CA5510009)**Reporting Year: **2018** | **1/2018 - 12/2018****\*\*\* YOUR WATER AUDIT DATA VALIDITY SCORE IS: 64 out of 100 \*\*\***System Attributes:

Apparent Losses:	1.629	MG/Yr
+ Real Losses:	8.358	MG/Yr
= <b>Water Losses:</b>	<b>9.987</b>	MG/Yr

? Unavoidable Annual Real Losses (UARL):	38.28	MG/Yr
--	-------	-------

Annual cost of Apparent Losses:	\$14,546	
---------------------------------	----------	--

Annual cost of Real Losses:	\$23,034	Valued at <b>Variable Production Cost</b>
-----------------------------	----------	---

Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial:	{	Non-revenue water as percent by volume of Water Supplied:	12.3%	
		Non-revenue water as percent by cost of operating system:	1.7%	Real Losses valued at Variable Production Cost

Operational Efficiency:	{	Apparent Losses per service connection per day:	1.37	gallons/connection/day
		Real Losses per service connection per day:	7.01	gallons/connection/day
		Real Losses per length of main per day*:	N/A	
		Real Losses per service connection per day per psi pressure:	0.06	gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL):	8.36	million gallons/year
--	------	----------------------

? Infrastructure Leakage Index (ILI) [CARL/UARL]:	0.22	
---	------	--

\* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



## AWWA Free Water Audit Software: User Comments

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Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

General Comment:	
<b>General Comment:</b>	
Audit Item	Comment
<a href="#">Volume from own sources:</a>	Since the GCSD treats surface water from SFPUD, the water is classified as volume from own source. Metered data from raw water meters upstream of the GCSD WTPs is used in this audit. Currently readings are not taken at meters directly downstream of the existing WTPs. Assumption used in this audit is that there are no water losses throughout the treatment process, which isn't likely the reality. A DVG of 7 has been applied
<a href="#">Vol. from own sources: Master meter error adjustment:</a>	The GCSD has 5 storage tanks throughout their water system. The GCSD confirmed that tank levels are not recorded. Therefore, no water balance across the system can take place.
<a href="#">Water imported:</a>	Not Applicable.
<a href="#">Water imported: master meter error adjustment:</a>	Not applicable. The GCSD does not import finished potable water.
<a href="#">Water exported:</a>	GCSD does not export finished potable water.
<a href="#">Water exported: master meter error adjustment:</a>	Not applicable. The GCSD does not export finished potable water.
<a href="#">Billed metered:</a>	All water billed includes all rate classes (residential, commercial and governmental). The District only performs meter testing when a problem is encountered. When a meter reads 6 consecutive zeros, the meter is manually checked by the District's operators. The District replaces water meters only when a malfunction occurs. A DVG of 6 has been applied because the District follows a "limited meter accuracy testing" program.
<a href="#">Billed unmetered:</a>	Not applicable. All water is metered in the GCSD and no unmetered accounts exist.
<a href="#">Unbilled metered:</a>	Approximately 3,000,000 gallons per year is used for flushing activities (directional flushing program, auto flushers and tank cleaning). Since the District has policies in place that identify what type of metered water receives a billing exemption and water consumption is quantified directly from meter readings where available, a DVG of 7 has been applied.
<a href="#">Unbilled unmetered:</a>	Default value has been applied.

Audit Item	Comment
<a href="#">Unauthorized consumption:</a>	Default value has been applied.
<a href="#">Customer metering inaccuracies:</a>	Customer meter accuracy testing is performed on problem meters (customer complaints, suspicious billing reads, ect.). Since meter accuracy tests are triggered by customer requests or consumption flags, a DVG of 4 has been applied.
<a href="#">Systematic data handling errors:</a>	Default grade applied
<a href="#">Length of mains:</a>	According to the GCSD, there are 71 miles of water mains within the District's service area. Since sound written policy and procedures exist for documenting new water main installation, a DVG of 4 has been applied.
<a href="#">Number of active AND inactive service connections:</a>	There are a total of 3,266 service connections within the District's service area, this includes both active and inactive connections. All connections are metered. (3,246 active connections, 20 meters for fire suppression/street cleaning/ect). The District maintains new account activation and billing policies/procedures which are reviewed on an annual basis. The District billing system consists of the Springbrook software. Error in count of the number of service connections is to be no more than 2%. For these reasons a DVG of 8 has been applied.
<a href="#">Average length of customer service line:</a>	Default input and grade applied. Customer meters are typically located at the property boundary.
<a href="#">Average operating pressure:</a>	Average was taken from all gauges attached to the PRV. Basic - telemetry or pressure logging at supply locations. Since input has been inferred from data, a DVG of 4 has been applied.
<a href="#">Total annual cost of operating water system:</a>	Average annual operating costs were obtained from the GCSD FY 18/19 and FY 19/20 budget. Operating cost is limited to potable water system only. The District has a reliable electronic, industry standard cost accounting system in place, with all pertinent water system tracked. Additionally, data is audited monthly by utility personnel and annually by a third-party CPA. For these reasons, a DVG of 10 has been applied.
<a href="#">Customer retail unit cost (applied to Apparent Losses):</a>	The average total consumption revenue was obtained from the GCSD FY 18/19 and FY 19/20 accepted budget. Provided by GCSD was the FY18/19 and FY 19/20 budget. Rate structure: classes, tiered rates. The input value was calculated from average total water revenues (\$924,201) divided by total billed consumption (103.469 MG). Since an up to date rate schedule is in place and applied reliably in billing operations a DVG of 6 has been applied.
<a href="#">Variable production cost (applied to Real Losses):</a>	Values provided by GCSD FY 17/18, FY18/19, FY 19/20 budgets and 2018 actual water expenses. Variable production cost includes only primary and secondary cost, fixed cost are not included. Since only a strict variable product cost (power, chemicals, water purchase, ect) is used, a DVG of 5 has been applied.



# AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	Groveland Community Services District (CA5510009)	
Reporting Year:	2018	1/2018 - 12/2018
Data Validity Score:	64	

		Water Exported <i>0.000</i>	Billed Water Exported			Revenue Water <b>0.000</b>
<b>Own Sources</b> (Adjusted for known errors)  117.930	<b>System Input</b> 117.930	<b>Water Supplied</b> 117.930	<b>Authorized Consumption</b>  107.943	<b>Billed Authorized Consumption</b>  103.469	<b>Billed Metered Consumption (water exported is removed)</b>  103.469	<b>Revenue Water</b>  103.469
				<b>Unbilled Authorized Consumption</b>  4.474	<b>Billed Unmetered Consumption</b>  0.000	
			<b>Water Losses</b>  9.987	<b>Apparent Losses</b>  1.629	<b>Unbilled Metered Consumption</b>  3.000	<b>Non-Revenue Water (NRW)</b>  14.461
				<b>Real Losses</b>  8.358	<b>Unbilled Unmetered Consumption</b>  1.474	
<b>Leakage on Transmission and/or Distribution Mains</b> <i>Not broken down</i>	<b>Unauthorized Consumption</b>  0.295					
<b>Water Imported</b>  0.000			<b>Leakage and Overflows at Utility's Storage Tanks</b> <i>Not broken down</i>	<b>Customer Metering Inaccuracies</b>  1.075		
			<b>Leakage on Service Connections</b> <i>Not broken down</i>	<b>Systematic Data Handling Errors</b>  0.259		





# AWWA Free Water Audit Software: Dashboard

WAS v5.0

American Water Works Association.

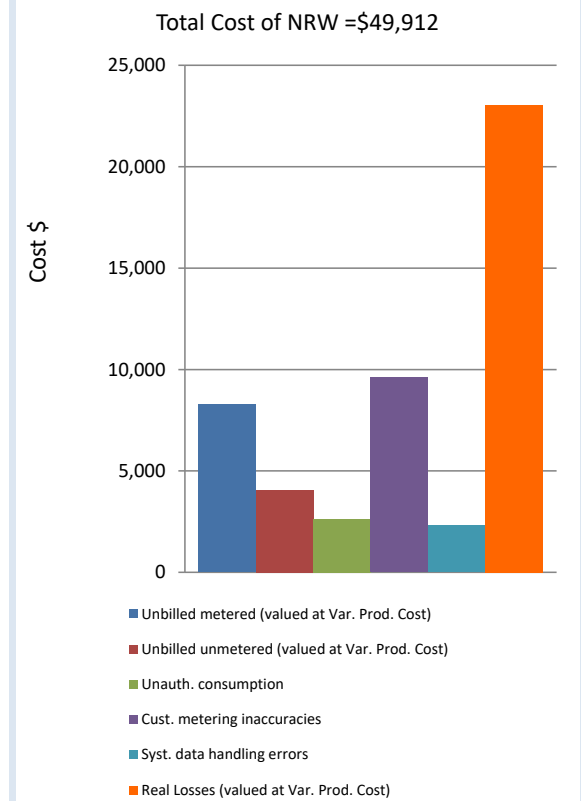
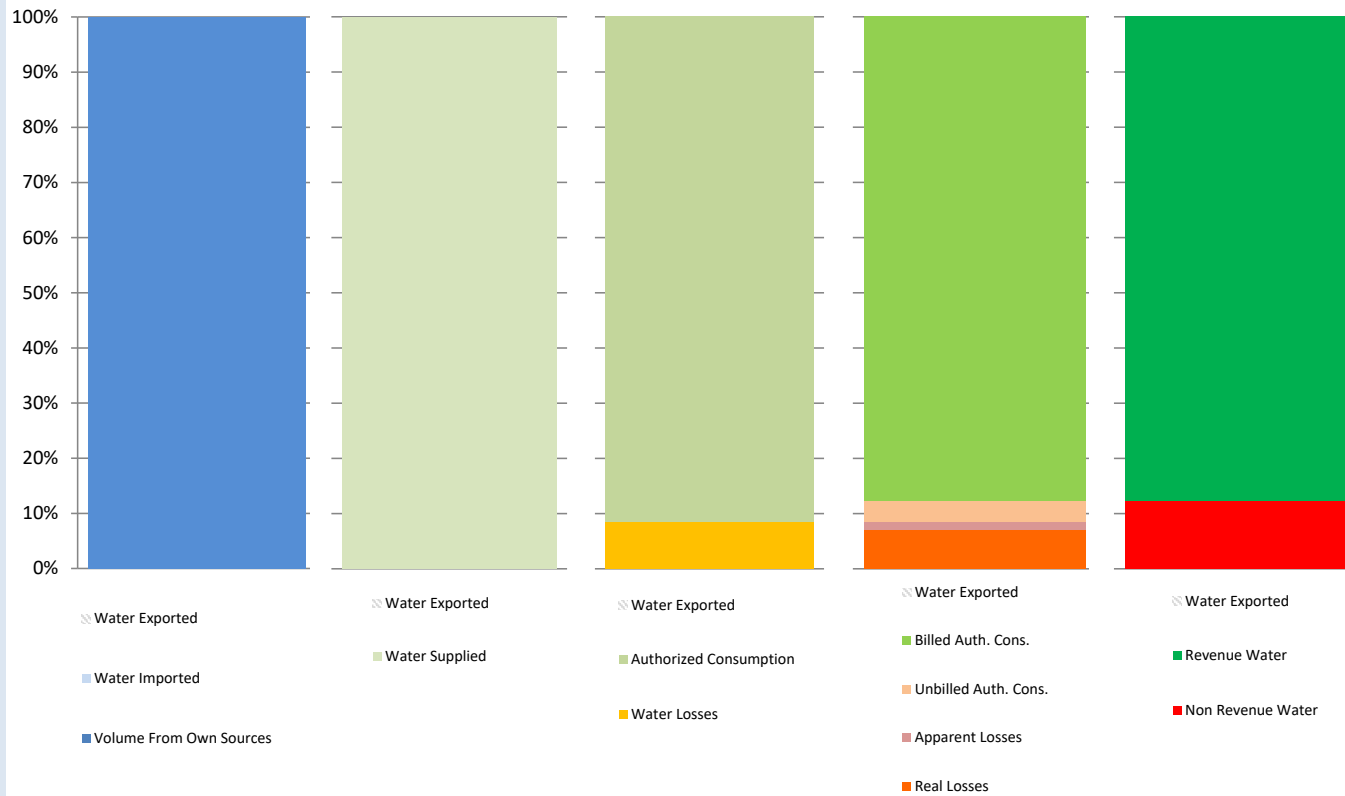
The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

Water Audit Report for: **Groveland Community Services District (CA5510009)**

Reporting Year: **2018**      **1/2018 - 12/2018**

Data Validity Score: **64**

- Show me the VOLUME of Non-Revenue Water
- Show me the COST of Non-Revenue Water



AWWA Free Water Audit Software: **Grading Matrix**

The grading assigned to each audit component and the corresponding recommended improvements and actions are highlighted in yellow. Audit accuracy is likely to be improved by prioritizing those items shown in red

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
<b>WATER SUPPLIED</b>											
<b>Volume from own sources:</b>	Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.	25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.	Conditions between 2 and 4	50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.	Conditions between 4 and 6	At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Volume from own Sources" component:		<u>to qualify for 2:</u> Organize and launch efforts to collect data for determining volume from own sources	<u>to qualify for 4:</u> Locate all water production sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered water production sources and replace any obsolete/defective meters.		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all source meters; specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/defective meters.		<u>to qualify for 8:</u> Conduct annual meter accuracy testing and calibration of related instrumentation on all meter installations on a regular basis. Complete project to install new, or replace defective existing, meters so that entire production meter population is metered. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing and calibration of related instrumentation for all meter installations. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to further improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Volume from own sources master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its sources of supply	Inventory information on meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined	No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system; tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.	Conditions between 2 and 4	Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include estimate of daily changes in tanks/storage facilities. Meter data is adjusted when gross data errors occur, or occasional meter testing deems this necessary.	Conditions between 4 and 6	Hourly production meter data logged automatically & reviewed on at least a weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and/or error is confirmed by meter accuracy testing. Tank/storage facility elevation changes are automatically used in calculating a balanced "Volume from own sources" component, and data gaps in the archived data are corrected on at least a weekly basis.	Conditions between 6 and 8	Continuous production meter data is logged automatically & reviewed each business day. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Tank/storage facility elevation changes are automatically used in "Volume from own sources" tabulations and data gaps in the archived data are corrected on a daily basis.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically balances flows from all sources and storages; results are reviewed each business day. Tight accountability controls ensure that all data gaps that occur in the archived flow data are quickly detected and corrected. Regular calibrations between SCADA and sources meters ensures minimal data transfer error.
Improvements to attain higher data grading for "Master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature.	<u>to qualify for 4:</u> Install automatic datalogging equipment on production meters. Complete installation of level instrumentation at all tanks/storage facilities and include tank level data in automatic calculation routine in a computerized system. Construct a computerized listing or spreadsheet to archive input volumes, tank/storage volume changes and import/export flows in order to determine the composite "Water Supplied" volume for the distribution system. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps.		<u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly production meter data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Use daily net storage change to balance flows in calculating "Water Supplied" volume. Necessary corrections to data errors are implemented on a weekly basis.		<u>to qualify for 8:</u> Ensure that all flow data is collected and archived on at least an hourly basis. All data is reviewed and detected errors corrected each business day. Tank/storage levels variations are employed in calculating balanced "Water Supplied" component. Adjust production meter data for gross error and inaccuracy confirmed by testing.		<u>to qualify for 10:</u> Link all production and tank/storage facility elevation change data to a Supervisory Control & Data Acquisition (SCADA) System, or similar computerized monitoring/control system, and establish automatic flow balancing algorithm and regularly calibrate between SCADA and source meters. Data is reviewed and corrected each business day.		<u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters. Continue to replace or repair meters as they perform outside of desired accuracy limits. Stay abreast of new and more accurate water level instruments to better record tank/storage levels and archive the variations in storage volume. Keep current with SCADA and data management systems to ensure that archived data is well-managed and error free.
Water Imported:	Select n/a if the water utility's supply is exclusively from its own water resources (no bulk purchased/ imported water)	Less than 25% of imported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of imported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of imported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of imported water sources are metered, meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually for all meter installations. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Imported Volume" component:  <i>(Note: usually the water supplier selling the water - "the Exporter" - to the utility being audited is responsible to maintain the metering installation measuring the imported volume. The utility should coordinate carefully with the Exporter to ensure that adequate meter upkeep takes place and an accurate measure of the Water Imported volume is quantified.)</i>		<u>to qualify for 2:</u> Review bulk water purchase agreements with partner suppliers; confirm requirements for use and maintenance of accurate metering. Identify needs for new or replacement meters with goal to meter all imported water sources.	<u>To qualify for 4:</u> Locate all imported water sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered imported water interconnections and replace obsolete/defective meters.		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all imported water meters, planning for both regular meter accuracy testing and calibration of the related instrumentation. Continue installation of meters on unmetered imported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8:</u> Complete project to install new, or replace defective, meters on all imported water interconnections. Maintain annual meter accuracy testing for all imported water meters and conduct calibration of related instrumentation at least annually. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Continue to conduct calibration of related instrumentation on a semi-annual basis. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Water imported master meter and supply error adjustment:	Select n/a if the Imported water supply is unmetred, with Imported water quantities estimated on the billing invoices sent by the Exporter to the purchasing Utility.	Inventory information on imported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with water Exporter(s) are missing or written in vague language concerning meter management and testing.	No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Imported supply metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis by the Exporter with necessary corrections implemented. Meter data is adjusted by the Exporter when gross data errors are detected. A coherent data trail exists for this process to protect both the selling and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly Imported supply metered data is logged automatically & reviewed on at least a weekly basis by the Exporter. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error confirmed by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling and the purchasing Utility.	Conditions between 6 and 8	Continuous Imported supply metered flow data is logged automatically & reviewed each business day by the Exporter. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the Exporter. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water imported master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the selling and purchasing Utility.	<u>to qualify for 4:</u> Install automatic datalogging equipment on Imported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the Exporters to jointly review terms of the written agreements regarding meter accuracy testing and data management, revise the terms as necessary.		<u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly Imported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		<u>to qualify for 8:</u> Ensure that all Imported supply metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		<u>to qualify for 10:</u> Conduct accountability checks to confirm that all Imported supply metered data is reviewed and corrected each business day by the Exporter. Results of all meter accuracy tests and data corrections should be available for sharing between the Exporter and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreement between the selling and the purchasing Utility; at least every five years.		<u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the Exporter to help identify meter replacement needs. Keep communication lines with Exporters open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
Water Exported:	Select n/a if the water utility sells no bulk water to neighboring water utilities (no exported water sales)	Less than 25% of exported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of exported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of exported water sources are metered, meter accuracy testing and/or electronic calibration conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy.	Conditions between 8 and 10	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Exported Volume" component:  <i>(Note: usually, if the water utility being audited sells (Exports) water to a neighboring purchasing Utility, it is the responsibility of the utility exporting the water to maintain the metering installation measuring the Exported volume. The utility exporting the water should ensure that adequate meter upkeep takes place and an accurate measure of the Water Exported volume is quantified.)</i>		<u>to qualify for 2:</u> Review bulk water sales agreements with purchasing utilities; confirm requirements for use & upkeep of accurate metering. Identify needs to install new, or replace defective meters as needed.	<u>To qualify for 4:</u> Locate all exported water sources on maps and in field, launch meter accuracy testing for existing meters, begin to install meters on unmetred exported water interconnections and replace obsolete/defective meters		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all exported water meters. Continue installation of meters on unmetred exported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8:</u> Complete project to install new, or replace defective, meters on all exported water interconnections. Maintain annual meter accuracy testing for all exported water meters. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing for all meters. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Water exported master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its exported supply interconnections.	Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.	No automatic datalogging of exported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Exported metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. Meter data is adjusted by the utility selling (exporting) the water when gross data errors are detected. A coherent data trail exists for this process to protect both the utility exporting the water and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly exported supply metered data is logged automatically & reviewed on at least a weekly basis by the utility selling the water. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error found by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling (exporting) utility and the purchasing Utility.	Conditions between 6 and 8	Continuous exported supply metered flow data is logged automatically & reviewed each business day by the utility selling (exporting) the water. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and any error confirmed by meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling (exporting) Utility and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the utility selling (exporting) the water. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling Utility and purchasing Utility at least once every five years.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Water exported master meter and supply error adjustment" component.		<p><u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the utility selling (exporting) the water and the purchasing Utility.</p>	<p><u>to qualify for 4:</u> Install automatic datalogging equipment on exported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the purchasing utilities to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.</p>		<p><u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly exported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.</p>		<p><u>to qualify for 8:</u> Ensure that all exported metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.</p>		<p><u>to qualify for 10:</u> Conduct accountability checks to confirm that all exported metered flow data is reviewed and corrected each business day by the utility selling the water. Results of all meter accuracy tests and data corrections should be available for sharing between the utility and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreements with the purchasing utilities, at least every five years.</p>		<p><u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the purchasing utilities to help identify meter replacement needs. Keep communication lines with the purchasing utilities open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.</p>
<b>AUTHORIZED CONSUMPTION</b>											
Billed metered:	n/a (not applicable). Select n/a only if the entire customer population is not metered and is billed for water service on a flat or fixed rate basis. In such a case the volume entered must be zero.	Less than 50% of customers with volume-based billings from meter readings; flat or fixed rate billing exists for the majority of the customer population	At least 50% of customers with volume-based billing from meter reads; flat rate billing for others. Manual meter reading is conducted with less than 50% meter read success rate, remaining accounts consumption is estimated. Limited meter records, no regular meter testing or replacement. Billing data maintained on paper records, with no auditing.	Conditions between 2 and 4	At least 75% of customers with volume-based, billing from meter reads; flat or fixed rate billing for remaining accounts. Manual meter reading is conducted with at least 50% meter read success rate; consumption for accounts with failed reads is estimated. Purchase records verify age of customer meters; only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Conditions between 4 and 6	At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter records exist, but only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducted by utility personnel.	Conditions between 6 and 8	At least 97% of customers exist with volume-based billing from meter reads. At least 90% customer meter reading success rate; or at least 80% read success rate with planning and budgeting for trials of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) in one or more pilot areas. Good customer meter records. Regular meter accuracy testing guides replacement of statistically significant number of meters each year. Routine auditing of computerized billing records for global and detailed statistics occurs annually by utility personnel, and is verified by third party at least once every five years.	Conditions between 8 and 10	At least 99% of customers exist with volume-based billing from meter reads. At least 95% customer meter reading success rate; or minimum 80% meter reading success rate, with Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) trials underway. Statistically significant customer meter testing and replacement program in place on a continuous basis. Computerized billing with routine, detailed auditing, including field investigation of representative sample of accounts undertaken annually by utility personnel. Audit is conducted by third party auditors at least once every three years.
Improvements to attain higher data grading for "Billed Metered Consumption" component.	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	<p><u>to qualify for 2:</u> Conduct investigations or trials of customer meters to select appropriate meter models. Budget funding for meter installations. Investigate volume based water rate structures.</p>	<p><u>to qualify for 4:</u> Purchase and install meters on unmetered accounts. Implement policies to improve meter reading success. Catalog meter information during meter read visits to identify age/model of existing meters. Test a minimal number of meters for accuracy. Install computerized billing system.</p>		<p><u>to qualify for 6:</u> Purchase and install meters on unmetered accounts. Eliminate flat fee billing and establish appropriate water rate structure based upon measured consumption. Continue to achieve verifiable success in removing manual meter reading barriers. Expand meter accuracy testing. Launch regular meter replacement program. Launch a program of annual auditing of global billing statistics by utility personnel.</p>		<p><u>to qualify for 8:</u> Purchase and install meters on unmetered accounts. If customer meter reading success rate is less than 97%, assess cost-effectiveness of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system for portion or entire system; or otherwise achieve ongoing improvements in manual meter reading success rate to 97% or higher. Refine meter accuracy testing program. Set meter replacement goals based upon accuracy test results. Implement annual auditing of detailed billing records by utility personnel and implement third party auditing at least once every five years.</p>		<p><u>to qualify for 10:</u> Purchase and install meters on unmetered accounts. Launch Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system trials if manual meter reading success rate of at least 99% is not achieved within a five-year program. Continue meter accuracy testing program. Conduct planning and budgeting for large scale meter replacement based upon meter life cycle analysis using cumulative flow target. Continue annual detailed billing data auditing by utility personnel and conduct third party auditing at least once every three years.</p>		<p><u>to maintain 10:</u> Continue annual internal billing data auditing, and third party auditing at least every three years. Continue customer meter accuracy testing to ensure that accurate customer meter readings are obtained and entered as the basis for volume based billing. Stay abreast of improvements in Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) and information management. Plan and budget for justified upgrades in metering, meter reading and billing data management to maintain very high accuracy in customer metering and billing.</p>
Billed unmetered:	Select n/a if it is the policy of the water utility to meter all customer connections and it has been confirmed by detailed auditing that all customers do indeed have a water meter, i.e. no intentionally unmetered accounts exist	Water utility policy does not require customer metering; flat or fixed fee billing is employed. No data is collected on customer consumption. The only estimates of customer population consumption available are derived from data estimation methods using average fixture count multiplied by number of connections, or similar approach.	Water utility policy does not require customer metering; flat or fixed fee billing is employed. Some metered accounts exist in parts of the system (pilot areas or District Metered Areas) with consumption read periodically or recorded on portable dataloggers over one, three, or seven day periods. Data from these sample meters are used to infer consumption for the total customer population. Site specific estimation methods are used for unusual buildings/water uses.	Conditions between 2 and 4	Water utility policy does require metering and volume based billing in general. However, a liberal amount of exemptions and a lack of clearly written and communicated procedures result in up to 20% of billed accounts believed to be unmetered by exemption; or the water utility is in transition to becoming fully metered, and a large number of customers remain unmetered. A rough estimate of the annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 4 and 6	Water utility policy does require metering and volume based billing but established exemptions exist for a portion of accounts such as municipal buildings. As many as 15% of billed accounts are unmetered due to this exemption or meter installation difficulties. Only a group estimate of annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 6 and 8	Water utility policy does require metering and volume based billing for all customer accounts. However, less than 5% of billed accounts remain unmetered because meter installation is hindered by unusual circumstances. The goal is to minimize the number of unmetered accounts. Reliable estimates of consumption are obtained for these unmetered accounts via site specific estimation methods.	Conditions between 8 and 10	Water utility policy does require metering and volume based billing for all customer accounts. Less than 2% of billed accounts are unmetered and exist because meter installation is hindered by unusual circumstances. The goal exists to minimize the number of unmetered accounts to the extent that is economical. Reliable estimates of consumption are obtained at these accounts via site specific estimation methods.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Billed Unmetered Consumption" component:		<p><u>to qualify for 2:</u> Conduct research and evaluate cost/benefit of a new water utility policy to require metering of the customer population; thereby greatly reducing or eliminating unmetered accounts. Conduct pilot metering project by installing water meters in small sample of customer accounts and periodically reading the meters or datalogging the water consumption over one, three, or seven day periods.</p>	<p><u>to qualify for 4:</u> Implement a new water utility policy requiring customer metering. Launch or expand pilot metering study to include several different meter types, which will provide data for economic assessment of full scale metering options. Assess sites with access difficulties to devise means to obtain water consumption volumes. Begin customer meter installation.</p>		<p><u>to qualify for 6:</u> Refine policy and procedures to improve customer metering participation for all but solidly exempt accounts. Assign staff resources to review billing records to identify errant unmetered properties. Specify metering needs and funding requirements to install sufficient meters to significantly reduce the number of unmetered accounts</p>		<p><u>to qualify for 8:</u> Push to install customer meters on a full scale basis. Refine metering policy and procedures to ensure that all accounts, including municipal properties, are designated for meters. Plan special efforts to address "hard-to-access" accounts. Implement procedures to obtain a reliable consumption estimate for the remaining few unmetered accounts awaiting meter installation.</p>		<p><u>to qualify for 10:</u> Continue customer meter installation throughout the service area, with a goal to minimize unmetered accounts. Sustain the effort to investigate accounts with access difficulties, and devise means to install water meters or otherwise measure water consumption.</p>		<p><u>to maintain 10:</u> Continue to refine estimation methods for unmetered consumption and explore means to establish metering, for as many billed remaining unmetered accounts as is economically feasible.</p>
Unbilled metered:	select n/a if all billing-exempt consumption is unmetered.	<p>Billing practices exempt certain accounts, such as municipal buildings, but written policies do not exist, and a reliable count of unbilled metered accounts is unavailable. Meter upkeep and meter reading on these accounts is rare and not considered a priority. Due to poor recordkeeping and lack of auditing, water consumption for all such accounts is purely guesstimated.</p>	<p>Billing practices exempt certain accounts, such as municipal buildings, but only scattered, dated written directives exist to justify this practice. A reliable count of unbilled metered accounts is unavailable. Sporadic meter replacement and meter reading occurs on an as-needed basis. The total annual water consumption for all unbilled, metered accounts is estimated based upon approximating the number of accounts and assigning consumption from actively billed accounts of same meter size.</p>	Conditions between 2 and 4	<p>Dated written procedures permit billing exemption for specific accounts, such as municipal properties, but are unclear regarding certain other types of accounts. Meter reading is given low priority and is sporadic. Consumption is quantified from meter readings where available. The total number of unbilled, unmetered accounts must be estimated along with consumption volumes.</p>	Conditions between 4 and 6	<p>Written policies regarding billing exemptions exist but adherence in practice is questionable. Metering and meter reading for municipal buildings is reliable but sporadic for other unbilled metered accounts. Periodic auditing of such accounts is conducted. Water consumption is quantified directly from meter readings where available, but the majority of the consumption is estimated.</p>	Conditions between 6 and 8	<p>Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.</p>	Conditions between 8 and 10	<p>Clearly written policy identifies the types of accounts given a billing exemption, with emphasis on keeping such accounts to a minimum. Customer meter management and meter reading for these accounts is given proper priority and is reliably conducted. Regular auditing confirms this. Total water consumption for these accounts is taken from reliable readings from accurate meters.</p>
Improvements to attain higher data grading for "Unbilled Metered Consumption" component:		<p><u>to qualify for 2:</u> Reassess the water utility's policy allowing certain accounts to be granted a billing exemption. Draft an outline of a new written policy for billing exemptions, with clear justification as to why any accounts should be exempt from billing, and with the intention to keep the number of such accounts to a minimum.</p>	<p><u>to qualify for 4:</u> Review historic written directives and policy documents allowing certain accounts to be billing-exempt. Draft an outline of a written policy for billing exemptions, identify criteria that grants an exemption, with a goal of keeping this number of accounts to a minimum. Consider increasing the priority of reading meters on unbilled accounts at least annually.</p>		<p><u>to qualify for 6:</u> Draft a new written policy regarding billing exemptions based upon consensus criteria allowing this occurrence. Assign resources to audit meter records and billing records to obtain census of unbilled metered accounts. Gradually include a greater number of these metered accounts to the routes for regular meter reading.</p>		<p><u>to qualify for 8:</u> Communicate billing exemption policy throughout the organization and implement procedures that ensure proper account management. Conduct inspections of accounts confirmed in unbilled metered status and verify that accurate meters exist and are scheduled for routine meter readings. Gradually increase the number of unbilled metered accounts that are included in regular meter reading routes.</p>		<p><u>to qualify for 10:</u> Ensure that meter management (meter accuracy testing, meter replacement) and meter reading activities for unbilled accounts are accorded the same priority as billed accounts. Establish ongoing annual auditing process to ensure that water consumption is reliably collected and provided to the annual water audit process.</p>		<p><u>to maintain 10:</u> Reassess the utility's philosophy in allowing any water uses to go "unbilled". It is possible to meter and bill all accounts, even if the fee charged for water consumption is discounted or waived. Metering and billing all accounts ensures that water consumption is tracked and water waste from plumbing leaks is detected and minimized.</p>
Unbilled unmetered:		<p>Extent of unbilled, unmetered consumption is unknown due to unclear policies and poor recordkeeping. Total consumption is quantified based upon a purely subjective estimate.</p>	<p>Clear extent of unbilled, unmetered consumption is unknown, but a number of events are randomly documented each year, confirming existence of such consumption, but without sufficient documentation to quantify an accurate estimate of the annual volume consumed.</p>	Conditions between 2 and 4	<p>Extent of unbilled, unmetered consumption is partially known, and procedures exist to document certain events such as miscellaneous fire hydrant uses. Formulae is used to quantify the consumption from such events (time running multiplied by typical flowrate, multiplied by number of events).</p>	Default value of 1.25% of system input volume is employed	<p>Coherent policies exist for some forms of unbilled, unmetered consumption but others await closer evaluation. Reasonable recordkeeping for the managed uses exists and allows for annual volumes to be quantified by inference, but unsupervised uses are guesstimated.</p>	Conditions between 6 and 8	<p>Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events) or temporary meters, and relatively subjective estimates of less regulated use.</p>	Conditions between 8 and 10	<p>Clear policies exist to identify permitted use of water in unbilled, unmetered fashion, with the intention of minimizing this type of consumption. Good records document each occurrence and consumption is quantified via formulae (time running multiplied by typical flow, multiplied by number of events) or use of temporary meters.</p>
Improvements to attain higher data grading for "Unbilled Unmetered Consumption" component:		<p><u>to qualify for 5:</u> Utilize the accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use.</p> <p><u>to qualify for 2:</u> Establish a policy regarding what water uses should be allowed to remain as unbilled and unmetered. Consider tracking a small sample of one such use (ex: fire hydrant flushings).</p>	<p><u>to qualify for 5:</u> Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use.</p> <p><u>to qualify for 4:</u> Evaluate the documentation of events that have been observed. Meet with user groups (ex: for fire hydrants - fire departments, contractors to ascertain their need and/or volume requirements for water from fire hydrants).</p>		<p><u>to qualify for 5:</u> Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process, and should focus on other components since the volume of unbilled, unmetered consumption is usually a relatively small quantity component, and other larger-quantity components should take priority.</p>	<p><u>to qualify for 6 or greater:</u> Finalize policy and begin to conduct field checks to better establish and quantify such usage. Proceed if top-down audit exists and/or a great volume of such use is suspected.</p>	<p><u>to qualify for 8:</u> Assess water utility policy and procedures for various unmetered usages. For example, ensure that a policy exists and permits are issued for use of fire hydrants by persons outside of the utility. Create written procedures for use and documentation of fire hydrants by water utility personnel. Use same approach for other types of unbilled, unmetered water usage.</p>		<p><u>to qualify for 10:</u> Refine written procedures to ensure that all uses of unbilled, unmetered water are overseen by a structured permitting process managed by water utility personnel. Reassess policy to determine if some of these uses have value in being converted to billed and/or metered status.</p>		<p><u>to maintain 10:</u> Continue to refine policy and procedures with intention of reducing the number of allowable uses of water in unbilled and unmetered fashion. Any uses that can feasibly become billed and metered should be converted eventually.</p>

APPARENT LOSSES

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Unauthorized consumption:		Extent of unauthorized consumption is unknown due to unclear policies and poor recordkeeping. Total unauthorized consumption is guesstimated.	Unauthorized consumption is a known occurrence, but its extent is a mystery. There are no requirements to document observed events, but periodic field reports capture some of these occurrences. Total unauthorized consumption is approximated from this limited data.	conditions between 2 and 4	Procedures exist to document some unauthorized consumption such as observed unauthorized fire hydrant openings. Use formulae to quantify this consumption (time running multiplied typical flowrate, multiplied by number of events).	Default value of 0.25% of volume of water supplied is employed	Coherent policies exist for some forms of unauthorized consumption (more than simply fire hydrant misuse) but others await closer evaluation. Reasonable surveillance and recordkeeping exist for occurrences that fall under the policy. Volumes quantified by inference from these records.	Conditions between 6 and 8	Clear policies and good auditable recordkeeping exist for certain events (ex: tampering with water meters, illegal bypasses of customer meters); but other occurrences have limited oversight. Total consumption is a combination of volumes from formulae (time x typical flow) and subjective estimates of unconfirmed consumption.	Conditions between 8 and 10	Clear policies exist to identify all known unauthorized uses of water. Staff and procedures exist to provide enforcement of policies and detect violations. Each occurrence is recorded and quantified via formulae (estimated time running multiplied by typical flow) or similar methods. All records and calculations should exist in a form that can be audited by a third party.
Improvements to attain higher data grading for "Unauthorized Consumption" component:		to qualify for 5: Use accepted default of 0.25% of volume of water supplied. to qualify for 2: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)	to qualify for 5: Use accepted default of 0.25% of system input volume to qualify for 4: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)		to qualify for 5: Utilize accepted default value of 0.25% of volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process.	to qualify for 6 or greater: Finalize policy updates to clearly identify the types of water consumption that are authorized from those usages that fall outside of this policy and are, therefore, unauthorized. Begin to conduct regular field checks. Proceed if the top-down audit already exists and/or a great volume of such use is suspected.	to qualify for 8: Assess water utility policies to ensure that all known occurrences of unauthorized consumption are outlawed, and that appropriate penalties are prescribed. Create written procedures for detection and documentation of various occurrences of unauthorized consumption as they are uncovered.		to qualify for 10: Refine written procedures and assign staff to seek out likely occurrences of unauthorized consumption. Explore new locking devices, monitors and other technologies designed to detect and thwart unauthorized consumption.		to maintain 10: Continue to refine policy and procedures to eliminate any loopholes that allow or tacitly encourage unauthorized consumption. Continue to be vigilant in detection, documentation and enforcement efforts.
Customer metering inaccuracies:	select n/a only if the entire customer population is unmetered. In such a case the volume entered must be zero.	Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is guesstimated.	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Conditions between 2 and 4	Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than just customer requests, but less than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.	Conditions between 4 and 6	A reliable electronic recordkeeping system for meters exists. The meter population includes a mix of new high performing meters and dated meters with suspect accuracy. Routine, but limited, meter accuracy testing and meter replacement occur. Inaccuracy volume is quantified using a mix of reliable and less certain data.	Conditions between 6 and 8	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for various types of meters.	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for these meters.	Good records of all active customer meters exist and include as a minimum: meter number, account number/location, type, size and manufacturer. Ongoing meter replacement occurs according to a targeted and justified basis. Regular meter accuracy testing gives a reliable measure of composite inaccuracy volume for the customer meter population. New metering technology is embraced to keep overall accuracy improving. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Customer meter inaccuracy volume" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.	to qualify for 4: Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.		to qualify for 6: Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.		to qualify for 8: Expand annual meter accuracy testing to evaluate a statistically significant number of meter makes/models. Expand meter replacement program to replace statistically significant number of poor performing meters each year.		to qualify for 9: Continue efforts to manage meter population with reliable recordkeeping. Test a statistically significant number of meters each year and analyze test results in an ongoing manner to serve as a basis for a target meter replacement strategy based upon accumulated volume throughput.	to qualify for 10: Continue efforts to manage meter population with reliable recordkeeping, meter testing and replacement. Evaluate new meter types and install one or more types in 5-10 customer accounts each year in order to pilot improving metering technology.	to maintain 10: Increase the number of meters tested and replaced as justified by meter accuracy test data. Continually monitor development of new metering technology and Advanced Metering Infrastructure (AMI) to grasp opportunities for greater accuracy in metering of water flow and management of customer consumption data.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Systematic Data Handling Errors:	Note: all water utilities incur some amount of this error. Even in water utilities with unmetred customer populations and fixed rate billing, errors occur in annual billing tabulations. Enter a positive value for the volume and select a grading.	Policies and procedures for activation of new customer water billing accounts are vague and lack accountability. Billing data is maintained on paper records which are not well organized. No auditing is conducted to confirm billing data handling efficiency. An unknown number of customers escape routine billing due to lack of billing process oversight.	Policy and procedures for activation of new customer accounts and oversight of billing records exist but need refinement. Billing data is maintained on paper records or insufficiently capable electronic database. Only periodic unstructured auditing work is conducted to confirm billing data handling efficiency. The volume of unbilled water due to billing lapses is a guess.	Conditions between 2 and 4	Policy and procedures for new account activation and oversight of billing operations exist but needs refinement. Computerized billing system exists, but is dated or lacks needed functionality. Periodic, limited internal audits conducted and confirm with approximate accuracy the consumption volumes lost to billing lapses.	Conditions between 4 and 6	Policy and procedures for new account activation and oversight of billing operations is adequate and reviewed periodically. Computerized billing system is in use with basic reporting available. Any effect of billing adjustments on measured consumption volumes is well understood. Internal checks of billing data error conducted annually. Reasonably accurate quantification of consumption volume lost to billing lapses is obtained.	Conditions between 6 and 8	New account activation and billing operations policy and procedures are reviewed at least biannually. Computerized billing system includes an array of reports to confirm billing data and system functionality. Checks are conducted routinely to flag and explain zero consumption accounts. Annual internal checks conducted with third party audit conducted at least once every five years. Accountability checks flag billing lapses. Consumption lost to billing lapses is well quantified and reducing year-by-year.	Conditions between 8 and 10	Sound written policy and procedures exist for new account activation and oversight of customer billing operations. Robust computerized billing system gives high functionality and reporting capabilities which are utilized, analyzed and the results reported each billing cycle. Assessment of policy and data handling errors are conducted internally and audited by third party at least once every three years, ensuring consumption lost to billing lapses is minimized and detected as it occurs.
Improvements to attain higher data grading for "Systematic Data Handling Error volume" component:		<u>to qualify for 2:</u> Draft written policy and procedures for activating new water billing accounts and oversight of billing operations. Investigate and budget for computerized customer billing system. Conduct initial audit of billing records by flow-charting the basic business processes of the customer account/billing function.	<u>to qualify for 4:</u> Finalize written policy and procedures for activation of new billing accounts and overall billing operations management. Implement a computerized customer billing system. Conduct initial audit of billing records as part of this process.		<u>to qualify for 6:</u> Refine new account activation and billing operations procedures and ensure consistency with the utility policy regarding billing, and minimize opportunity for missed billings. Upgrade or replace customer billing system for needed functionality - ensure that billing adjustments don't corrupt the value of consumption volumes. Procedurize internal annual audit process.		<u>to qualify for 8:</u> Formalize regular review of new account activation process and general billing practices. Enhance reporting capability of computerized billing system. Formalize regular auditing process to reveal scope of data handling error. Plan for periodic third party audit to occur at least once every five years.		<u>to qualify for 10:</u> Close policy/procedure loopholes that allow some customer accounts to go unbilled, or data handling errors to exist. Ensure that billing system reports are utilized, analyzed and reported every billing cycle. Ensure that internal and third party audits are conducted at least once every three years.		<u>to maintain 10:</u> Stay abreast of customer information management developments and innovations. Monitor developments of Advanced Metering Infrastructure (AMI) and integrate technology to ensure that customer endpoint information is well-monitored and errors/lapses are at an economic minimum.
<b>SYSTEM DATA</b>											
Length of mains:		Poorly assembled and maintained paper as-built records of existing water main installations makes accurate determination of system pipe length impossible. Length of mains is guesstimated.	Paper records in poor or uncertain condition (no annual tracking of installations & abandonments). Poor procedures to ensure that new water mains installed by developers are accurately documented.	Conditions between 2 and 4	Sound written policy and procedures exist for documenting new water main installations, but gaps in management result in an uncertain degree of error in tabulation of mains length.	Conditions between 4 and 6	Sound written policy and procedures exist for permitting and commissioning new water mains. Highly accurate paper records with regular field validation; or electronic records and asset management system in good condition. Includes system backup.	Conditions between 6 and 8	Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographic Information System (GIS) and asset management system are used to store and manage data.	Conditions between 8 and 10	Sound written policy exists for managing water mains extensions and replacements. Geographic Information System (GIS) data and asset management database agree and random field validation proves truth of databases. Records of annual field validation should be available for review.
Improvements to attain higher data grading for "Length of Water Mains" component:		<u>to qualify for 2:</u> Assign personnel to inventory current as-built records and compare with customer billing system records and highway plans in order to verify poorly documented pipelines. Assemble policy documents regarding permitting and documentation of water main installations by the utility and building developers; identify gaps in procedures that result in poor documentation of new water main installations.	<u>to qualify for 4:</u> Complete inventory of paper records of water main installations for several years prior to audit year. Review policy and procedures for commissioning and documenting new water main installation.		<u>to qualify for 6:</u> Finalize updates/improvements to written policy and procedures for permitting/commissioning new main installations. Confirm inventory of records for five years prior to audit year; correct any errors or omissions.		<u>to qualify for 8:</u> Launch random field checks of limited number of locations. Convert to electronic database such as a Geographic Information System (GIS) with backup as justified. Develop written policy and procedures.		<u>to qualify for 10:</u> Link Geographic Information System (GIS) and asset management databases, conduct field verification of data. Record field verification information at least annually.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve the completeness and accuracy of the system.
Number of active AND inactive service connections:		Vague permitting (of new service connections) policy and poor paper recordkeeping of customer connections/billings result in suspect determination of the number of service connections, which may be 10-15% in error from actual count.	General permitting policy exists but paper records, procedural gaps, and weak oversight result in questionable total for number of connections, which may vary 5-10% of actual count.	Conditions between 2 and 4	Written account activation policy and procedures exist, but with some gaps in performance and oversight. Computerized information management system is being brought online to replace dated paper recordkeeping system. Reasonably accurate tracking of service connection installations & abandonments; but count can be up to 5% in error from actual total.	Conditions between 4 and 6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Conditions between 6 and 8	Policies and procedures for new account activation and overall billing operations are written, well-structured and reviewed at least biannually. Well-managed computerized information management system exists and routine, periodic field checks and internal system audits are conducted. Counts of connections are no more than 2% in error.	Conditions between 8 and 10	Sound written policy and well managed and audited procedures ensure reliable management of service connection population. Computerized information management system, Customer Billing System, and Geographic Information System (GIS) information agree; field validation proves truth of databases. Count of connections recorded as being in error is less than 1% of the entire population.
Improvements to attain higher data grading for "Number of Active and Inactive Service Connections" component:	<b>Note: The number of Service Connections does not include fire hydrant leads/lines connecting the hydrant to the water main</b>	<u>to qualify for 2:</u> Draft new policy and procedures for new account activation and overall billing operations. Research and collect paper records of installations & abandonments for several years prior to audit year.	<u>to qualify for 4:</u> Refine policy and procedures for new account activation and overall billing operations. Research computerized recordkeeping system (Customer Information System or Customer Billing System) to improve documentation format for service connections.		<u>to qualify for 6:</u> Refine procedures to ensure consistency with new account activation and overall billing policy to establish new service connections or decommission existing connections. Improve process to include all totals for at least five years prior to audit year.		<u>to qualify for 8:</u> Formalize regular review of new account activation and overall billing operations policies and procedures. Launch random field checks of limited number of locations. Develop reports and auditing mechanisms for computerized information management system.		<u>to qualify for 10:</u> Close any procedural loopholes that allow installations to go undocumented. Link computerized information management system with Geographic Information System (GIS) and formalize field inspection and information system auditing processes. Documentation of new or decommissioned service connections encounters several levels of checks and balances.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve knowledge of system.
	Note: if customer water	Gradings 1-9 apply if customer properties are unmetred, if customer meters exist and are located inside the customer building premises, or if the water utility owns and is responsible for the entire service connection piping from the water main to the customer building. In any of these cases the average distance between the curb stop or boundary separating utility/customer responsibility for service connection piping, and the typical first point of use (ex: faucet) or the customer meter must be quantified. Gradings of 1-9 are used to grade the validity of the means to quantify this value. (See the "Service Connection Diagram" worksheet)									Either of two conditions can be met for a grading of 10:

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Average length of customer service line:	meters are located outside of the customer building next to the curb stop or boundary separating utility/customer responsibility, then the auditor should answer "Yes" to the question on the Reporting Worksheet asking about this. If the answer is Yes, the grading description listed under the Grading of 10(a) will be followed, with a value of zero automatically entered at a Grading of 10. See the Service Connection Diagram worksheet for a visual presentation of this distance.	Vague policy exists to define the delineation of water utility ownership and customer ownership of the service connection piping. Curb stops are perceived as the breakpoint but these have not been well-maintained or documented. Most are buried or obscured. Their location varies widely from site-to-site, and estimating this distance is arbitrary due to the unknown location of many curb stops.	Policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. The piping from the water main to the curb stop is the property of the water utility; and the piping from the curb stop to the customer building is owned by the customer. Curb stop locations are not well documented and the average distance is based upon a limited number of locations measured in the field.	Conditions between 2 and 4	Good policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. Curb stops are generally installed as needed and are reasonably documented. Their location varies widely from site-to-site, and an estimate of this distance is hindered by the availability of paper records of limited accuracy.	Conditions between 4 and 6	Clear written policy exists to define utility/customer responsibility for service connection piping. Accurate, well-maintained paper or basic electronic recordkeeping system exists. Periodic field checks confirm piping lengths for a sample of customer properties.	Conditions between 6 and 8	Clearly worded policy standardizes the location of curb stops and meters, which are inspected upon installation. Accurate and well maintained electronic records exist with periodic field checks to confirm locations of service lines, curb stops and customer meter pits. An accurate number of customer properties from the customer billing system allows for reliable averaging of this length.	Conditions between 8 and 10	a) Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer "Yes" to the question on the Reporting Working asking about this condition. A value of zero and a Grading of 10 are automatically entered in the Reporting Worksheet . b). Meters exist inside customer buildings, or properties are unmetered. In either case, answer "No" to the Reporting Worksheet question on meter location, and enter a distance determined by the auditor. For a Grading of 10 this value must be a very reliable number from a Geographic Information System (GIS) and confirmed by a statistically valid number of field checks.
Improvements to attain higher data grading for "Average Length of Customer Service Line" component:		<u>to qualify for 2:</u> Research and collect paper records of service line installations. Inspect several sites in the field using pipe locators to locate curb stops. Obtain the length of this small sample of connections in this manner.	<u>to qualify for 4:</u> Formalize and communicate policy delineating utility/customer responsibilities for service connection piping. Assess accuracy of paper records by field inspection of a small sample of service connections using pipe locators as needed. Research the potential migration to a computerized information management system to store service connection data.		<u>to qualify for 6:</u> Establish coherent procedures to ensure that policy for curb stop, meter installation and documentation is followed. Gain consensus within the water utility for the establishment of a computerized information management system.		<u>to qualify for 8:</u> Implement an electronic means of recordkeeping, typically via a customer information system, customer billing system, or Geographic Information System (GIS). Standardize the process to conduct field checks of a limited number of locations.		<u>to qualify for 10:</u> Link customer information management system and Geographic Information System (GIS), standardize process for field verification of data.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve knowledge of service connection configurations and customer meter locations.
Average operating pressure:		Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain, high system head loss and weak/erratic pressure controls further compromise the validity of the average pressure calculation.	Limited telemetry monitoring of scattered pumping station and water storage tank sites provides some static pressure data, which is recorded in handwritten logbooks. Pressure data is gathered at individual sites only when low pressure complaints arise. Average pressure is determined by averaging relatively crude data, and is affected by significant variation in ground elevations, system head loss and gaps in pressure controls in the distribution system.	Conditions between 2 and 4	Effective pressure controls separate different pressure zones; moderate pressure variation across the system; occasional open boundary valves are discovered that breach pressure zones. Basic telemetry monitoring of the distribution system logs pressure data electronically. Pressure data gathered by gauges or dataloggers at fire hydrants or buildings when low pressure complaints arise, and during fire flow tests and system flushing. Reliable topographical data exists. Average pressure is calculated using this mix of data.	Conditions between 4 and 6	Reliable pressure controls separate distinct pressure zones; only very occasional open boundary valves are encountered that breach pressure zones. Well-covered telemetry monitoring of the distribution system (not just pumping at source treatment plants or wells) logs extensive pressure data electronically. Pressure gathered by gauges/dataloggers at fire hydrants and buildings when low pressure complaints arise, and during fire flow tests and system flushing. Average pressure is determined by using this mix of reliable data.	Conditions between 6 and 8	Well-managed, discrete pressure zones exist with generally predictable pressure fluctuations. A current full-scale SCADA System or similar realtime monitoring system exists to monitor the water distribution system and collect data, including real time pressure readings at representative sites across the system. The average system pressure is determined from reliable monitoring system data.	Conditions between 8 and 10	Well-managed pressure districts/zones, SCADA System and hydraulic model exist to give very precise pressure data across the water distribution system. Average system pressure is reliably calculated from extensive, reliable, and cross-checked data. Calculations are reported on an annual basis as a minimum.
Improvements to attain higher data grading for "Average Operating Pressure" component:		<u>to qualify for 2:</u> Employ pressure gauging and/or datalogging equipment to obtain pressure measurements from fire hydrants. Locate accurate topographical maps of service area in order to confirm ground elevations. Research pump data sheets to find pump pressure/flow characteristics	<u>to qualify for 4:</u> Formalize a procedure to use pressure gauging/datalogging equipment to gather pressure data during various system events such as low pressure complaints, or operational testing. Gather pump pressure and flow data at different flow regimes. Identify faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) and plan to properly configure pressure zones. Make all pressure data from these efforts available to generate system-wide average pressure.		<u>to qualify for 6:</u> Expand the use of pressure gauging/datalogging equipment to gather scattered pressure data at a representative set of sites, based upon pressure zones or areas. Utilize pump pressure and flow data to determine supply head entering each pressure zone or district. Correct any faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) to ensure properly configured pressure zones. Use expanded pressure dataset from these activities to generate system-wide average pressure.		<u>to qualify for 8:</u> Install a Supervisory Control and Data Acquisition (SCADA) System, or similar realtime monitoring system, to monitor system parameters and control operations. Set regular calibration schedule for instrumentation to insure data accuracy. Obtain accurate topographical data and utilize pressure data gathered from field surveys to provide extensive, reliable data for pressure averaging.		<u>to qualify for 10:</u> Annually, obtain a system-wide average pressure value from the hydraulic model of the distribution system that has been calibrated via field measurements in the water distribution system and confirmed in comparisons with SCADA System data.		<u>to maintain 10:</u> Continue to refine the hydraulic model of the distribution system and consider linking it with SCADA System for realtime pressure data calibration, and averaging.



Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
<b>COST DATA</b>											
Total annual cost of operating water system:		Incomplete paper records and lack of financial accounting documentation on many operating functions makes calculation of water system operating costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to estimate the major portion of water system operating costs.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. However, gaps in data are known to exist, periodic internal reviews are conducted but not a structured financial audit.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited periodically by utility personnel, but not a Certified Public Accountant (CPA).	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited at least annually by utility personnel, and at least once every three years by third-party CPA.	Conditions between 8 and 10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.
Improvements to attain higher data grading for "Total Annual Cost of Operating the Water System" component:		<u>to qualify for 2:</u> Gather available records, institute new financial accounting procedures to regularly collect and audit basic cost data of most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Establish process for periodic internal audit of water system operating costs; identify cost data gaps and institute procedures for tracking these outstanding costs.		<u>to qualify for 8:</u> Standardize the process to conduct routine financial audit on an annual basis. Arrange for CPA audit of financial records at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and long-term cost trend, and budget/track costs proactively
Customer retail unit cost (applied to Apparent Losses):	Customer population unmetered, and/or only a fixed fee is charged for consumption.	Antiquated, cumbersome water rate structure is used, with periodic historic amendments that were poorly documented and implemented; resulting in classes of customers being billed inconsistent charges. The actual composite billing rate likely differs significantly from the published water rate structure, but a lack of auditing leaves the degree of error indeterminate.	Dated, cumbersome water rate structure, not always employed consistently in actual billing operations. The actual composite billing rate is known to differ from the published water rate structure, and a reasonably accurate estimate of the degree of error is determined, allowing a composite billing rate to be quantified.	Conditions between 2 and 4	Straight-forward water rate structure in use, but not updated in several years. Billing operations reliably employ the rate structure. The composite billing rate is derived from a single customer class such as residential customer accounts, neglecting the effect of different rates from varying customer classes.	Conditions between 4 and 6	Clearly written, up-to-date water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average residential rate using volumes of water in each rate block.	Conditions between 6 and 8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate, which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Conditions between 8 and 10	Current, effective water rate structure is in force and applied reliably in billing operations. The rate structure and calculations of composite rate - which includes residential, commercial, industrial, institutional (CII), and other distinct customer classes - are reviewed by a third party knowledgeable in the M36 methodology at least once every five years.
Improvements to attain higher data grading for "Customer Retail Unit Cost" component:		<u>to qualify for 2:</u> Formalize the process to implement water rates, including a secure documentation procedure. Create a current, formal water rate document and gain approval from all stakeholders.	<u>to qualify for 4:</u> Review the water rate structure and update/formalize as needed. Assess billing operations to ensure that actual billing operations incorporate the established water rate structure.		<u>to qualify for 6:</u> Evaluate volume of water used in each usage block by residential users. Multiply volumes by full rate structure.	<u>Launch effort to fully meter the customer population and charge rates based upon water volumes</u>	<u>to qualify for 8:</u> Evaluate volume of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to qualify for 10:</u> Conduct a periodic third-party audit of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to maintain 10:</u> Keep water rate structure current in addressing the water utility's revenue needs. Update the calculation of the customer unit rate as new rate components, customer classes, or other components are modified.
Variable production cost (applied to Real Losses):	Note: if the water utility purchases/imports its entire water supply, then enter the unit purchase cost of the bulk water supply in the Reporting Worksheet with a grading of 10	Incomplete paper records and lack of documentation on primary operating functions (electric power and treatment costs most importantly) makes calculation of variable production costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to roughly estimate the basic operations costs (pumping power costs and treatment costs) and calculate a unit variable production cost.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. Electric power and treatment costs are reliably tracked and allow accurate weighted calculation of unit variable production costs based on these two inputs and water imported purchase costs (if applicable). All costs are audited internally on a periodic basis.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent primary and secondary variable production and water imported purchase (if applicable) costs tracked. The data is audited at least annually by utility personnel, and at least once every three years by a third-party knowledgeable in the M36 methodology.	Conditions between 8 and 10	Either of two conditions can be met to obtain a grading of 10: 1) Third party CPA audit of all pertinent primary and secondary variable production and water imported purchase (if applicable) costs on an annual basis. or: 2) Water supply is entirely purchased as bulk water imported, and the unit purchase cost - including all applicable marginal supply costs - serves as the variable production cost. If all applicable marginal supply costs are not included in this figure, a grade of 10 should <u>not</u> be selected.
Improvements to attain higher data grading for "Variable Production Cost" component:		<u>to qualify for 2:</u> Gather available records, institute new procedures to regularly collect and audit basic cost data and most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Formalize process for regular internal audits of production costs. Assess whether additional costs (liability, residuals management, equipment wear, impending infrastructure expansion) should be included to calculate a more representative variable production cost.		<u>to qualify for 8:</u> Formalize the accounting process to include direct cost components (power, treatment) as well as indirect cost components (liability, residuals management, etc.) Arrange to conduct audits by a knowledgeable third-party at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and budget/track costs proactively



## AWWA Free Water Audit Software: Determining Water Loss Standing

WAS v5.0

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Water Audit Report for: **Groveland Community Services District (CA5510009)**

Reporting Year: **2018**    1/2018 - 12/2018

Data Validity Score: **64**

### Water Loss Control Planning Guide

Water Audit Data Validity Level / Score					
Functional Focus Area	Level I (0-25)	Level II (26-50)	Level III (51-70)	Level IV (71-90)	Level V (91-100)
Audit Data Collection	Launch auditing and loss control team; address production metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs. Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table)	Performance Benchmarking - ILI is meaningful in comparing real loss standing	Identify Best Practices/ Best in class - the ILI is very reliable as a real loss performance indicator for best in class service

*For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.*

Once data have been entered into the Reporting Worksheet, the performance indicators are automatically calculated. How does a water utility operator know how well his or her system is performing? The AWWA Water Loss Control Committee provided the following table to assist water utilities in gauging an approximate Infrastructure Leakage Index (ILI) that is appropriate for their water system and local conditions. The lower the amount of leakage and real losses that exist in the system, then the lower the ILI value will be.

**Note:** this table offers an approximate guideline for leakage reduction target-setting. The best means of setting such targets include performing an economic assessment of various loss control methods. However, this table is useful if such an assessment is not possible.

**General Guidelines for Setting a Target ILI  
(without doing a full economic analysis of leakage control options)**

Target ILI Range	Financial Considerations	Operational Considerations	Water Resources Considerations
1.0 - 3.0	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulation or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
>3.0 - 5.0	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions (leakage management, water conservation) are included in the long-term
>5.0 - 8.0	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
Greater than 8.0	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective utilization of water as a resource. Setting a target level greater than 8.0 - other than as an incremental goal to a smaller long-term target - is discouraged.		
Less than 1.0	If the calculated Infrastructure Leakage Index (ILI) value for your system is 1.0 or less, two possibilities exist. a) you are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control. b) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI value but do not employ extensive leakage control practices in your operations. In such cases it is beneficial to validate the data by performing field measurements to confirm the accuracy of production and customer meters, or to identify any other potential sources of error in the data.		

**VALIDATOR PROVIDED INFORMATION**

**Certified Validation Report**

**Audit Information**

Water Supplier Information: Groveland Community Services District

PWS ID: CA5510009

System Type: Potable

Audit Period: January - December 2019

Utility Representation: Peter Kampa, General Manager  
Luis Melchor, Operations Manager

Interview Time: November 9, 2019 at 2:00 PM

Validation Date: November 9, 2019

**Validation Findings & Confirmation Statement**

**Key Audit Metrics**

Data Validity Score: 64

Data Validity Band (Level): III (51-70)

ILI: 0.42

Real Loss: 16.208 MG/Yr

Non-Revenue Water as Percentage of Cost of Operating System: 2.4%

Apparent Loss: 1.526 MG/Yr

**Certification Statement By Validator**

This water loss audit report has been Level One (1) validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on the volume derivation and Data Validity Grades were incorporated into the water audit

If not, rejected recommendations are included here:

**Validator Information**

Water Audit Validator: Angela Hall

Qualifications: Water Audit Validator Certificate issued by the CA-NV Section of the AWWA

**UTILITY PROVIDED INFORMATION**

Water Supplier Name: Groveland Community Services District

Water Supplier ID Number: CA5510009

Water Audit Period: January - December 2019

**Water Audit & Water Loss Improvement Steps:**

Utility to provide steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

For water supply meters, the District will be looking into issues with the existing SCADA system that are prohibiting automatic datalogging of meter readings. The District will continue to conduct meter calibration on the water supply meter at least on an annual basis. For customer meters, the District is currently seeking grant funding to replace the exiting system with Automatic Metering Reading (AMR) system, that will transfer meter readings though the implementation of a fixed network.

**Certification Statement by Utility Executive:**

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audit and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Name (Print)

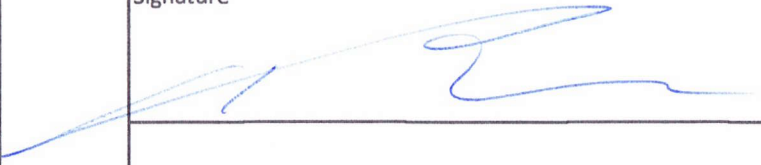
Title

*Peter Kampa*

*General Manager*

Signature

Date



*11-09-2020*

# AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

## Please begin by providing the following information

Name of Contact Person:

Email Address:

Telephone | Ext.:

Name of City / Utility:

City/Town/Municipality:

State / Province:

Country:

Year:

Audit Preparation Date:

Volume Reporting Units:

PWSID / Other ID:

## The following guidance will help you complete the Audit

All audit data are entered on the [Reporting Worksheet](#)

- 
 Value can be entered by user
- 
 Value calculated based on input data
- 
 These cells contain recommended default values

Use of Option (Radio) Buttons:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

<p><b><u>Instructions</u></b></p> <p>The current sheet. Enter contact information and basic audit details (year, units etc)</p>	<p><b><u>Reporting Worksheet</u></b></p> <p>Enter the required data on this worksheet to calculate the water balance and data grading</p>	<p><b><u>Comments</u></b></p> <p>Enter comments to explain how values were calculated or to document data sources</p>	<p><b><u>Performance Indicators</u></b></p> <p>Review the performance indicators to evaluate the results of the audit</p>	<p><b><u>Water Balance</u></b></p> <p>The values entered in the Reporting Worksheet are used to populate the Water Balance</p>	<p><b><u>Dashboard</u></b></p> <p>A graphical summary of the water balance and Non-Revenue Water components</p>
<p><b><u>Grading Matrix</u></b></p> <p>Presents the possible grading options for each input component of the audit</p>	<p><b><u>Service Connection Diagram</u></b></p> <p>Diagrams depicting possible customer service connection line configurations</p>	<p><b><u>Definitions</u></b></p> <p>Use this sheet to understand the terms used in the audit process</p>	<p><b><u>Loss Control Planning</u></b></p> <p>Use this sheet to interpret the results of the audit validity score and performance indicators</p>	<p><b><u>Example Audits</u></b></p> <p>Reporting Worksheet and Performance Indicators examples are shown for two validated audits</p>	<p><b><u>Acknowledgements</u></b></p> <p>Acknowledgements for the AWWA Free Water Audit Software v5.0</p>

If you have questions or comments regarding the software please contact us via email at: [wlc@awwa.org](mailto:wlc@awwa.org)



# AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

American Water Works Association

? Click to access definition  
+ Click to add a comment

**Water Audit Report for: Groveland Community Services District (CA5510009)**  
**Reporting Year: 2019      1/2019 - 12/2019**

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

**All volumes to be entered as: MILLION GALLONS (US) PER YEAR**

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

**WATER SUPPLIED**

<----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+	?	7	117.587	MG/Yr
Water imported:	+	?	n/a	0.000	MG/Yr
Water exported:	+	?	n/a	0.000	MG/Yr

**Master Meter and Supply Error Adjustments**

Pcmt:	Value:	MG/Yr
+	?	3
+	?	
+	?	

**WATER SUPPLIED: 117.587 MG/Yr**

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

**AUTHORIZED CONSUMPTION**

Billed metered:	+	?	6	95.383	MG/Yr
Billed unmetered:	+	?	n/a	0.000	MG/Yr
Unbilled metered:	+	?	7	3.000	MG/Yr
Unbilled unmetered:	+	?		1.470	MG/Yr

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

**AUTHORIZED CONSUMPTION: 99.853 MG/Yr**

Click here: ? for help using option buttons below

Pcmt: 1.25% Value: MG/Yr

Use buttons to select percentage of water supplied OR value

**WATER LOSSES (Water Supplied - Authorized Consumption)**

**17.734 MG/Yr**

**Apparent Losses**

Unauthorized consumption: + ? 0.294 MG/Yr  
 Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+	?	4	0.994	MG/Yr
Systematic data handling errors:	+	?		0.238	MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

**Apparent Losses: 1.526 MG/Yr**

Pcmt: 0.25% Value: MG/Yr

1.00% MG/Yr  
0.25% MG/Yr

**Real Losses (Current Annual Real Losses or CARL)**

Real Losses = Water Losses - Apparent Losses: ? **16.208 MG/Yr**

**WATER LOSSES: 17.734 MG/Yr**

**NON-REVENUE WATER**

**NON-REVENUE WATER: 22.204 MG/Yr**

= Water Losses + Unbilled Metered + Unbilled Unmetered

**SYSTEM DATA**

Length of mains:	+	?	4	71.0	miles
Number of active AND inactive service connections:	+	?	8	3,253	
Service connection density:	?			46	conn./mile main

Are customer meters typically located at the curbside or property line? Yes (length of service line, beyond the property boundary, that is the responsibility of the utility)

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

Average operating pressure: + ? 4 120.0 psi

**COST DATA**

Total annual cost of operating water system:	+	?	10	\$2,851,297	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	6	\$10.23	\$/1000 gallons (US)
Variable production cost (applied to Real Losses):	+	?	5	\$2,609.00	\$/Million gallons <input type="checkbox"/> Use Customer Retail Unit Cost to value real losses

**WATER AUDIT DATA VALIDITY SCORE:**

\*\*\* YOUR SCORE IS: 64 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: Customer metering inaccuracies
- 3: Billed metered



## AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.

Water Audit Report for: **Groveland Community Services District (CA5510009)**Reporting Year: **2019** | **1/2019 - 12/2019****\*\*\* YOUR WATER AUDIT DATA VALIDITY SCORE IS: 64 out of 100 \*\*\***System Attributes:

Apparent Losses:	1.526	MG/Yr
+ Real Losses:	16.208	MG/Yr
= <b>Water Losses:</b>	<b>17.734</b>	MG/Yr

? Unavoidable Annual Real Losses (UARL):	38.20	MG/Yr
--	-------	-------

Annual cost of Apparent Losses:	\$15,613	
---------------------------------	----------	--

Annual cost of Real Losses:	\$42,287	Valued at <b>Variable Production Cost</b>
-----------------------------	----------	---

Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial:	{	Non-revenue water as percent by volume of Water Supplied:	18.9%	
		Non-revenue water as percent by cost of operating system:	2.4%	Real Losses valued at Variable Production Cost

Operational Efficiency:	{	Apparent Losses per service connection per day:	1.29	gallons/connection/day
		Real Losses per service connection per day:	13.65	gallons/connection/day
		Real Losses per length of main per day*:	N/A	
		Real Losses per service connection per day per psi pressure:	0.11	gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL):	16.21	million gallons/year
--	-------	----------------------

? Infrastructure Leakage Index (ILI) [CARL/UARL]:	0.42	
---	------	--

\* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline





## AWWA Free Water Audit Software: User Comments

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Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

<b>General Comment:</b>	
-------------------------	--

Audit Item	Comment
<a href="#">Volume from own sources:</a>	The GCSD treats surface water from SFPUD supplied through the Hetch Hetchy mountain tunnel. Therefore, the water is classified as volume from own source. Metered data from raw water meters leaving the Hetch Hetchy mountain tunnel are used in this audit. The GCSD has water meters located at the influent of each treatment plant, the effluent from each treatment plant and the distribution system before entering customer meters. Currently, the GCSD perform annual water meter calibrations on all of the above referenced water meters, but the data gathered from these water meters is not logged. From the 2019 calibration test, less than 10% of meters were found outside of +/- 3% accuracy. A DVG of 7 has been applied. The GCSD is currently working on a system that will log the data from each of the above referenced water meters.
<a href="#">Vol. from own sources: Master meter error adjustment:</a>	The GCSD has 5 storage tanks throughout their water system. The GCSD confirmed that tank levels are not recorded. Therefore, no water balance across the system can take place. Since changes in storage have not been included, a DVG of 3 is applied.
<a href="#">Water imported:</a>	Not Applicable.
<a href="#">Water imported: master meter error adjustment:</a>	Not applicable. The GCSD does not import finished potable water.
<a href="#">Water exported:</a>	GCSD does not export finished potable water.
<a href="#">Water exported: master meter error adjustment:</a>	Not applicable. The GCSD does not export finished potable water.
<a href="#">Billed metered:</a>	All water billed includes all rate classes (residential, commercial and governmental). The District only performs meter testing when a problem is encountered. When a meter reads 6 consecutive zeros, the meter is manually checked by the District's operators. The District replaces water meters only when a malfunction occurs. A DVG of 6 has been applied because the District follows a "limited meter accuracy testing" program.
<a href="#">Billed unmetered:</a>	Not applicable. All water is metered in the GCSD and no unmetered accounts exist.
<a href="#">Unbilled metered:</a>	Approximately 3,000,000 gallons per year is used for flushing activities (directional flushing program, auto flushers and tank cleaning). Since the District has policies in place that identify what type of metered water receives a billing exemption and water consumption is quantified directly from meter readings where available, a DVG of 7 has been applied.

Audit Item	Comment
<a href="#">Unbilled unmetered:</a>	Default value has been applied.
<a href="#">Unauthorized consumption:</a>	Default value has been applied.
<a href="#">Customer metering inaccuracies:</a>	Customer meter accuracy testing is performed on problem meters (customer complaints, suspicious billing reads, etc..). Since meter accuracy tests are triggered by customer requests or consumption flags, a DVG of 4 has been applied.
<a href="#">Systematic data handling errors:</a>	Default grade applied
<a href="#">Length of mains:</a>	According to the GCSD, there are 71 miles of water mains within the District's service area. Since sound written policy and procedures exist for documenting new water main installation, a DVG of 4 has been applied.
<a href="#">Number of active AND inactive service connections:</a>	There is a total of 3,253 service connections within the District's service area, this includes both active and inactive connections. All connections are metered. The District maintains new account activation and billing policies/procedures which are reviewed on an annual basis. The District billing system consists of the Springbrook software. Error in count of the number of service connections is to be no more than 2%. For these reasons, a DVG of 8 has been applied.
<a href="#">Average length of customer service line:</a>	Default input and grade applied. Customer meters are typically located at the property boundary.
<a href="#">Average operating pressure:</a>	120 psi is the average operating pressure. Average was taken from all gauges attached to the PRV. Basic - telemetry or pressure logging at supply locations. Since input has been inferred from data, a DVG of 4 has been applied.
<a href="#">Total annual cost of operating water system:</a>	Average annual operating costs were obtained from the GCSD FY 18/19 and FY 19/20 budget. Operating cost is limited to potable water system only. The District has a reliable electronic, industry standard cost accounting system in place, with all pertinent water system tracked. Additionally, data is audited monthly by utility personnel and annually by a third-party CPA. For these reasons, a DVG of 10 has been applied.
<a href="#">Customer retail unit cost (applied to Apparent Losses):</a>	The average total consumption revenue was obtained from the GCSD FY 18/19 and FY 19/20 accepted budget. Provided by GCSD was the FY18/19 and FY 19/20 budget. Rate structure: classes, tiered rates. The input value was calculated from average total water revenues (\$975,413) divided by total billed consumption (95.382 MG). Since an up to date rate schedule is in place and applied reliably in billing operations a DVG of 6 has been applied.
<a href="#">Variable production cost (applied to Real Losses):</a>	Values provided by GCSD FY 2018/19 and FY 2019/20 actual water expences. Variable production cost includes only primary and scndary cost, fixed cost are not included. Since only a strict bariable product cost (power, checmicals, water purchase, ect) is used, a DVG of 5 has been applied.



# AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	Groveland Community Services District (CA5510009)	
Reporting Year:	2019	1/2019 - 12/2019
Data Validity Score:	64	

		Water Exported <i>0.000</i>	Billed Water Exported			Revenue Water <b>0.000</b>
<b>Own Sources</b> (Adjusted for known errors)  <b>117.587</b>	<b>System Input</b> <b>117.587</b>	<b>Water Supplied</b> <b>117.587</b>	<b>Authorized Consumption</b>  <b>99.853</b>	<b>Billed Authorized Consumption</b>  <b>95.383</b>	<b>Billed Metered Consumption (water exported is removed)</b>  <b>95.383</b>	<b>Revenue Water</b>  <b>95.383</b>
					<b>Billed Unmetered Consumption</b>  <i>0.000</i>	
				<b>Unbilled Authorized Consumption</b>  <i>4.470</i>	<b>Unbilled Metered Consumption</b>  <i>3.000</i>	<b>Non-Revenue Water (NRW)</b>  <b>22.204</b>
					<b>Unbilled Unmetered Consumption</b>  <i>1.470</i>	
	<b>Apparent Losses</b>  <i>1.526</i>	<b>Unauthorized Consumption</b>  <i>0.294</i>				
			<b>Customer Metering Inaccuracies</b>  <i>0.994</i>			
			<b>Systematic Data Handling Errors</b>  <i>0.238</i>			
<b>Water Imported</b>  <b>0.000</b>			<b>Water Losses</b>  <i>17.734</i>	<b>Real Losses</b>  <i>16.208</i>	<b>Leakage on Transmission and/or Distribution Mains</b> <i>Not broken down</i>	
					<b>Leakage and Overflows at Utility's Storage Tanks</b> <i>Not broken down</i>	
					<b>Leakage on Service Connections</b> <i>Not broken down</i>	



# AWWA Free Water Audit Software: Dashboard

WAS v5.0

American Water Works Association.

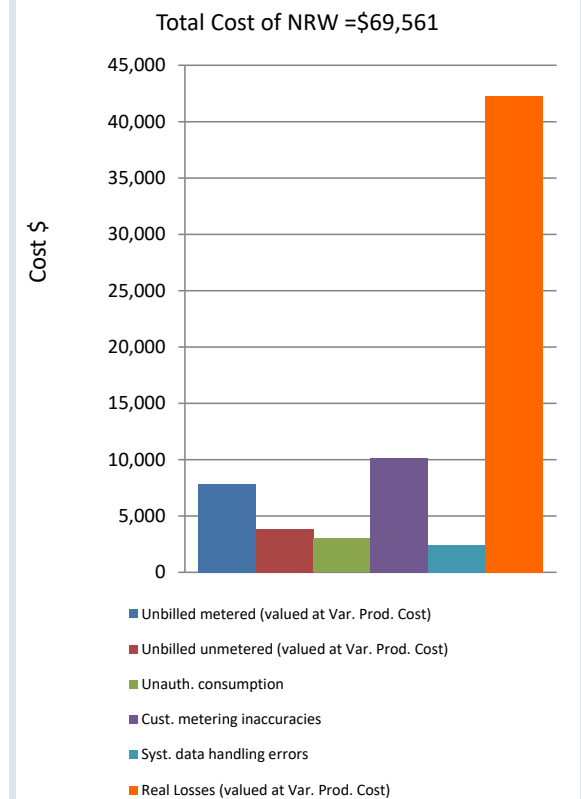
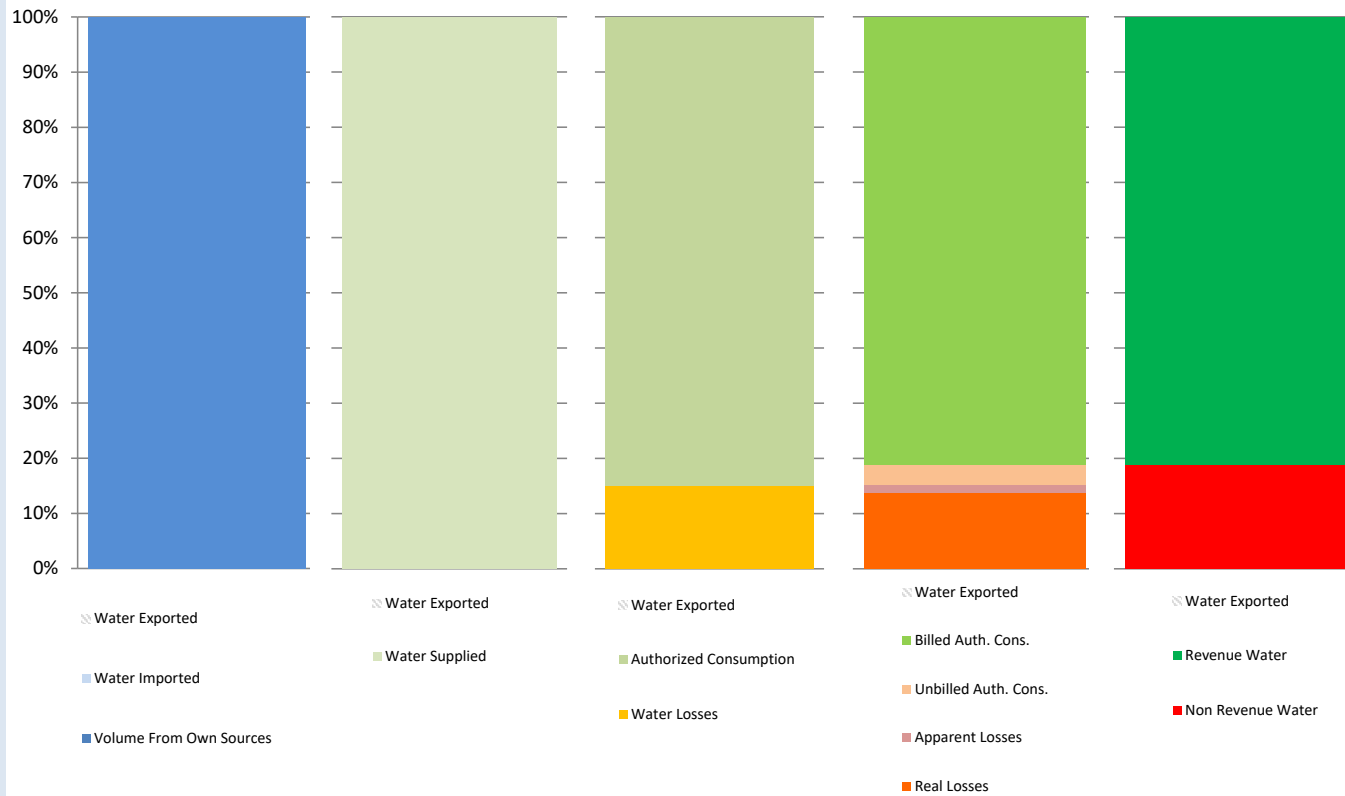
The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

Water Audit Report for: **Groveland Community Services District (CA5510009)**

Reporting Year: **2019**    **1/2019 - 12/2019**

Data Validity Score: **64**

- Show me the VOLUME of Non-Revenue Water
- Show me the COST of Non-Revenue Water



AWWA Free Water Audit Software: **Grading Matrix**

The grading assigned to each audit component and the corresponding recommended improvements and actions are highlighted in yellow. Audit accuracy is likely to be improved by prioritizing those items shown in red

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
<b>WATER SUPPLIED</b>											
Volume from own sources:	Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.	25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.	Conditions between 2 and 4	50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.	Conditions between 4 and 6	At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Volume from own Sources" component:		<u>to qualify for 2:</u> Organize and launch efforts to collect data for determining volume from own sources	<u>to qualify for 4:</u> Locate all water production sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered water production sources and replace any obsolete/defective meters.		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all source meters; specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/defective meters.		<u>to qualify for 8:</u> Conduct annual meter accuracy testing and calibration of related instrumentation on all meter installations on a regular basis. Complete project to install new, or replace defective existing, meters so that entire production meter population is metered. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing and calibration of related instrumentation for all meter installations. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to further improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Volume from own sources master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its sources of supply	Inventory information on meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined	No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system; tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.	Conditions between 2 and 4	Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include estimate of daily changes in tanks/storage facilities. Meter data is adjusted when gross data errors occur, or occasional meter testing deems this necessary.	Conditions between 4 and 6	Hourly production meter data logged automatically & reviewed on at least a weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and/or error is confirmed by meter accuracy testing. Tank/storage facility elevation changes are automatically used in calculating a balanced "Volume from own sources" component, and data gaps in the archived data are corrected on at least a weekly basis.	Conditions between 6 and 8	Continuous production meter data is logged automatically & reviewed each business day. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Tank/storage facility elevation changes are automatically used in "Volume from own sources" tabulations and data gaps in the archived data are corrected on a daily basis.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically balances flows from all sources and storages; results are reviewed each business day. Tight accountability controls ensure that all data gaps that occur in the archived flow data are quickly detected and corrected. Regular calibrations between SCADA and sources meters ensures minimal data transfer error.
Improvements to attain higher data grading for "Master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature.	<u>to qualify for 4:</u> Install automatic datalogging equipment on production meters. Complete installation of level instrumentation at all tanks/storage facilities and include tank level data in automatic calculation routine in a computerized system. Construct a computerized listing or spreadsheet to archive input volumes, tank/storage volume changes and import/export flows in order to determine the composite "Water Supplied" volume for the distribution system. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps.		<u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly production meter data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Use daily net storage change to balance flows in calculating "Water Supplied" volume. Necessary corrections to data errors are implemented on a weekly basis.		<u>to qualify for 8:</u> Ensure that all flow data is collected and archived on at least an hourly basis. All data is reviewed and detected errors corrected each business day. Tank/storage levels variations are employed in calculating balanced "Water Supplied" component. Adjust production meter data for gross error and inaccuracy confirmed by testing.		<u>to qualify for 10:</u> Link all production and tank/storage facility elevation change data to a Supervisory Control & Data Acquisition (SCADA) System, or similar computerized monitoring/control system, and establish automatic flow balancing algorithm and regularly calibrate between SCADA and source meters. Data is reviewed and corrected each business day.		<u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters. Continue to replace or repair meters as they perform outside of desired accuracy limits. Stay abreast of new and more accurate water level instruments to better record tank/storage levels and archive the variations in storage volume. Keep current with SCADA and data management systems to ensure that archived data is well-managed and error free.
Water Imported:	Select n/a if the water utility's supply is exclusively from its own water resources (no bulk purchased/ imported water)	Less than 25% of imported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of imported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of imported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of imported water sources are metered, meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually for all meter installations. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Imported Volume" component:  <i>(Note: usually the water supplier selling the water - "the Exporter" - to the utility being audited is responsible to maintain the metering installation measuring the imported volume. The utility should coordinate carefully with the Exporter to ensure that adequate meter upkeep takes place and an accurate measure of the Water Imported volume is quantified.)</i>		<u>to qualify for 2:</u> Review bulk water purchase agreements with partner suppliers; confirm requirements for use and maintenance of accurate metering. Identify needs for new or replacement meters with goal to meter all imported water sources.	<u>To qualify for 4:</u> Locate all imported water sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered imported water interconnections and replace obsolete/defective meters.		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all imported water meters, planning for both regular meter accuracy testing and calibration of the related instrumentation. Continue installation of meters on unmetered imported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8:</u> Complete project to install new, or replace defective, meters on all imported water interconnections. Maintain annual meter accuracy testing for all imported water meters and conduct calibration of related instrumentation at least annually. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Continue to conduct calibration of related instrumentation on a semi-annual basis. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Water imported master meter and supply error adjustment:	Select n/a if the Imported water supply is unmetered, with Imported water quantities estimated on the billing invoices sent by the Exporter to the purchasing Utility.	Inventory information on imported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with water Exporter(s) are missing or written in vague language concerning meter management and testing.	No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Imported supply metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis by the Exporter with necessary corrections implemented. Meter data is adjusted by the Exporter when gross data errors are detected. A coherent data trail exists for this process to protect both the selling and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly Imported supply metered data is logged automatically & reviewed on at least a weekly basis by the Exporter. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error confirmed by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling and the purchasing Utility.	Conditions between 6 and 8	Continuous Imported supply metered flow data is logged automatically & reviewed each business day by the Exporter. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the Exporter. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water imported master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the selling and purchasing Utility.	<u>to qualify for 4:</u> Install automatic datalogging equipment on Imported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the Exporters to jointly review terms of the written agreements regarding meter accuracy testing and data management, revise the terms as necessary.		<u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly Imported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		<u>to qualify for 8:</u> Ensure that all Imported supply metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		<u>to qualify for 10:</u> Conduct accountability checks to confirm that all Imported supply metered data is reviewed and corrected each business day by the Exporter. Results of all meter accuracy tests and data corrections should be available for sharing between the Exporter and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreement between the selling and the purchasing Utility; at least every five years.		<u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the Exporter to help identify meter replacement needs. Keep communication lines with Exporters open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
Water Exported:	Select n/a if the water utility sells no bulk water to neighboring water utilities (no exported water sales)	Less than 25% of exported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of exported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of exported water sources are metered, meter accuracy testing and/or electronic calibration conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Exported Volume" component:  <i>(Note: usually, if the water utility being audited sells (Exports) water to a neighboring purchasing Utility, it is the responsibility of the utility exporting the water to maintain the metering installation measuring the Exported volume. The utility exporting the water should ensure that adequate meter upkeep takes place and an accurate measure of the Water Exported volume is quantified.)</i>		<u>to qualify for 2:</u> Review bulk water sales agreements with purchasing utilities; confirm requirements for use & upkeep of accurate metering. Identify needs to install new, or replace defective meters as needed.	<u>To qualify for 4:</u> Locate all exported water sources on maps and in field, launch meter accuracy testing for existing meters, begin to install meters on unmetered exported water interconnections and replace obsolete/defective meters		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all exported water meters. Continue installation of meters on unmetered exported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8:</u> Complete project to install new, or replace defective, meters on all exported water interconnections. Maintain annual meter accuracy testing for all exported water meters. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing for all meters. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Water exported master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its exported supply interconnections.	Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.	No automatic datalogging of exported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Exported metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. Meter data is adjusted by the utility selling (exporting) the water when gross data errors are detected. A coherent data trail exists for this process to protect both the utility exporting the water and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly exported supply metered data is logged automatically & reviewed on at least a weekly basis by the utility selling the water. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error found by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling (exporting) utility and the purchasing Utility.	Conditions between 6 and 8	Continuous exported supply metered flow data is logged automatically & reviewed each business day by the utility selling (exporting) the water. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and any error confirmed by meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling (exporting) Utility and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the utility selling (exporting) the water. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling Utility and purchasing Utility at least once every five years.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Water exported master meter and supply error adjustment" component.		<p><u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the utility selling (exporting) the water and the purchasing Utility.</p>	<p><u>to qualify for 4:</u> Install automatic datalogging equipment on exported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the purchasing utilities to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.</p>		<p><u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly exported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.</p>		<p><u>to qualify for 8:</u> Ensure that all exported metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.</p>		<p><u>to qualify for 10:</u> Conduct accountability checks to confirm that all exported metered flow data is reviewed and corrected each business day by the utility selling the water. Results of all meter accuracy tests and data corrections should be available for sharing between the utility and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreements with the purchasing utilities, at least every five years.</p>		<p><u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the purchasing utilities to help identify meter replacement needs. Keep communication lines with the purchasing utilities open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.</p>
<b>AUTHORIZED CONSUMPTION</b>											
Billed metered:	n/a (not applicable). Select n/a only if the entire customer population is not metered and is billed for water service on a flat or fixed rate basis. In such a case the volume entered must be zero.	Less than 50% of customers with volume-based billings from meter readings; flat or fixed rate billing exists for the majority of the customer population	At least 50% of customers with volume-based billing from meter reads; flat rate billing for others. Manual meter reading is conducted with less than 50% meter read success rate, remaining accounts consumption is estimated. Limited meter records, no regular meter testing or replacement. Billing data maintained on paper records, with no auditing.	Conditions between 2 and 4	At least 75% of customers with volume-based, billing from meter reads; flat or fixed rate billing for remaining accounts. Manual meter reading is conducted with at least 50% meter read success rate; consumption for accounts with failed reads is estimated. Purchase records verify age of customer meters; only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Conditions between 4 and 6	At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter records exist, but only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducted by utility personnel.	Conditions between 6 and 8	At least 97% of customers exist with volume-based billing from meter reads. At least 90% customer meter reading success rate; or at least 80% read success rate with planning and budgeting for trials of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) in one or more pilot areas. Good customer meter records. Regular meter accuracy testing guides replacement of statistically significant number of meters each year. Routine auditing of computerized billing records for global and detailed statistics occurs annually by utility personnel, and is verified by third party at least once every five years.	Conditions between 8 and 10	At least 99% of customers exist with volume-based billing from meter reads. At least 95% customer meter reading success rate; or minimum 80% meter reading success rate, with Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) trials underway. Statistically significant customer meter testing and replacement program in place on a continuous basis. Computerized billing with routine, detailed auditing, including field investigation of representative sample of accounts undertaken annually by utility personnel. Audit is conducted by third party auditors at least once every three years.
Improvements to attain higher data grading for "Billed Metered Consumption" component.	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	<p><u>to qualify for 2:</u> Conduct investigations or trials of customer meters to select appropriate meter models. Budget funding for meter installations. Investigate volume based water rate structures.</p>	<p><u>to qualify for 4:</u> Purchase and install meters on unmetered accounts. Implement policies to improve meter reading success. Catalog meter information during meter read visits to identify age/model of existing meters. Test a minimal number of meters for accuracy. Install computerized billing system.</p>		<p><u>to qualify for 6:</u> Purchase and install meters on unmetered accounts. Eliminate flat fee billing and establish appropriate water rate structure based upon measured consumption. Continue to achieve verifiable success in removing manual meter reading barriers. Expand meter accuracy testing. Launch regular meter replacement program. Launch a program of annual auditing of global billing statistics by utility personnel.</p>		<p><u>to qualify for 8:</u> Purchase and install meters on unmetered accounts. If customer meter reading success rate is less than 97%, assess cost-effectiveness of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system for portion or entire system; or otherwise achieve ongoing improvements in manual meter reading success rate to 97% or higher. Refine meter accuracy testing program. Set meter replacement goals based upon accuracy test results. Implement annual auditing of detailed billing records by utility personnel and implement third party auditing at least once every five years.</p>		<p><u>to qualify for 10:</u> Purchase and install meters on unmetered accounts. Launch Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system trials if manual meter reading success rate of at least 99% is not achieved within a five-year program. Continue meter accuracy testing program. Conduct planning and budgeting for large scale meter replacement based upon meter life cycle analysis using cumulative flow target. Continue annual detailed billing data auditing by utility personnel and conduct third party auditing at least once every three years.</p>		<p><u>to maintain 10:</u> Continue annual internal billing data auditing, and third party auditing at least every three years. Continue customer meter accuracy testing to ensure that accurate customer meter readings are obtained and entered as the basis for volume based billing. Stay abreast of improvements in Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) and information management. Plan and budget for justified upgrades in metering, meter reading and billing data management to maintain very high accuracy in customer metering and billing.</p>
Billed unmetered:	Select n/a if it is the policy of the water utility to meter all customer connections and it has been confirmed by detailed auditing that all customers do indeed have a water meter, i.e. no intentionally unmetered accounts exist	Water utility policy does not require customer metering; flat or fixed fee billing is employed. No data is collected on customer consumption. The only estimates of customer population consumption available are derived from data estimation methods using average fixture count multiplied by number of connections, or similar approach.	Water utility policy does not require customer metering; flat or fixed fee billing is employed. Some metered accounts exist in parts of the system (pilot areas or District Metered Areas) with consumption read periodically or recorded on portable dataloggers over one, three, or seven day periods. Data from these sample meters are used to infer consumption for the total customer population. Site specific estimation methods are used for unusual buildings/water uses.	Conditions between 2 and 4	Water utility policy does require metering and volume based billing in general. However, a liberal amount of exemptions and a lack of clearly written and communicated procedures result in up to 20% of billed accounts believed to be unmetered by exemption; or the water utility is in transition to becoming fully metered, and a large number of customers remain unmetered. A rough estimate of the annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 4 and 6	Water utility policy does require metering and volume based billing but established exemptions exist for a portion of accounts such as municipal buildings. As many as 15% of billed accounts are unmetered due to this exemption or meter installation difficulties. Only a group estimate of annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 6 and 8	Water utility policy does require metering and volume based billing for all customer accounts. However, less than 5% of billed accounts remain unmetered because meter installation is hindered by unusual circumstances. The goal is to minimize the number of unmetered accounts. Reliable estimates of consumption are obtained for these unmetered accounts via site specific estimation methods.	Conditions between 8 and 10	Water utility policy does require metering and volume based billing for all customer accounts. Less than 2% of billed accounts are unmetered and exist because meter installation is hindered by unusual circumstances. The goal exists to minimize the number of unmetered accounts to the extent that is economical. Reliable estimates of consumption are obtained at these accounts via site specific estimation methods.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Billed Unmetered Consumption" component:		to qualify for 2: Conduct research and evaluate cost/benefit of a new water utility policy to require metering of the customer population; thereby greatly reducing or eliminating unmetered accounts. Conduct pilot metering project by installing water meters in small sample of customer accounts and periodically reading the meters or datalogging the water consumption over one, three, or seven day periods.	to qualify for 4: Implement a new water utility policy requiring customer metering. Launch or expand pilot metering study to include several different meter types, which will provide data for economic assessment of full scale metering options. Assess sites with access difficulties to devise means to obtain water consumption volumes. Begin customer meter installation.		to qualify for 6: Refine policy and procedures to improve customer metering participation for all but solidly exempt accounts. Assign staff resources to review billing records to identify errant unmetered properties. Specify metering needs and funding requirements to install sufficient meters to significantly reduce the number of unmetered accounts		to qualify for 8: Push to install customer meters on a full scale basis. Refine metering policy and procedures to ensure that all accounts, including municipal properties, are designated for meters. Plan special efforts to address "hard-to-access" accounts. Implement procedures to obtain a reliable consumption estimate for the remaining few unmetered accounts awaiting meter installation.		to qualify for 10: Continue customer meter installation throughout the service area, with a goal to minimize unmetered accounts. Sustain the effort to investigate accounts with access difficulties, and devise means to install water meters or otherwise measure water consumption.		to maintain 10: Continue to refine estimation methods for unmetered consumption and explore means to establish metering, for as many billed remaining unmetered accounts as is economically feasible.
Unbilled metered:	select n/a if all billing-exempt consumption is unmetered.	Billing practices exempt certain accounts, such as municipal buildings, but written policies do not exist, and a reliable count of unbilled metered accounts is unavailable. Meter upkeep and meter reading on these accounts is rare and not considered a priority. Due to poor recordkeeping and lack of auditing, water consumption for all such accounts is purely guesstimated.	Billing practices exempt certain accounts, such as municipal buildings, but only scattered, dated written directives exist to justify this practice. A reliable count of unbilled metered accounts is unavailable. Sporadic meter replacement and meter reading occurs on an as-needed basis. The total annual water consumption for all unbilled, metered accounts is estimated based upon approximating the number of accounts and assigning consumption from actively billed accounts of same meter size.	Conditions between 2 and 4	Dated written procedures permit billing exemption for specific accounts, such as municipal properties, but are unclear regarding certain other types of accounts. Meter reading is given low priority and is sporadic. Consumption is quantified from meter readings where available. The total number of unbilled, unmetered accounts must be estimated along with consumption volumes.	Conditions between 4 and 6	Written policies regarding billing exemptions exist but adherence in practice is questionable. Metering and meter reading for municipal buildings is reliable but sporadic for other unbilled metered accounts. Periodic auditing of such accounts is conducted. Water consumption is quantified directly from meter readings where available, but the majority of the consumption is estimated.	Conditions between 6 and 8	Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.	Conditions between 8 and 10	Clearly written policy identifies the types of accounts given a billing exemption, with emphasis on keeping such accounts to a minimum. Customer meter management and meter reading for these accounts is given proper priority and is reliably conducted. Regular auditing confirms this. Total water consumption for these accounts is taken from reliable readings from accurate meters.
Improvements to attain higher data grading for "Unbilled Metered Consumption" component:		to qualify for 2: Reassess the water utility's policy allowing certain accounts to be granted a billing exemption. Draft an outline of a new written policy for billing exemptions, with clear justification as to why any accounts should be exempt from billing, and with the intention to keep the number of such accounts to a minimum.	to qualify for 4: Review historic written directives and policy documents allowing certain accounts to be billing-exempt. Draft an outline of a written policy for billing exemptions, identify criteria that grants an exemption, with a goal of keeping this number of accounts to a minimum. Consider increasing the priority of reading meters on unbilled accounts at least annually.		to qualify for 6: Draft a new written policy regarding billing exemptions based upon consensus criteria allowing this occurrence. Assign resources to audit meter records and billing records to obtain census of unbilled metered accounts. Gradually include a greater number of these metered accounts to the routes for regular meter reading.		to qualify for 8: Communicate billing exemption policy throughout the organization and implement procedures that ensure proper account management. Conduct inspections of accounts confirmed in unbilled metered status and verify that accurate meters exist and are scheduled for routine meter readings. Gradually increase the number of unbilled metered accounts that are included in regular meter reading routes.		to qualify for 10: Ensure that meter management (meter accuracy testing, meter replacement) and meter reading activities for unbilled accounts are accorded the same priority as billed accounts. Establish ongoing annual auditing process to ensure that water consumption is reliably collected and provided to the annual water audit process.		to maintain 10: Reassess the utility's philosophy in allowing any water uses to go "unbilled". It is possible to meter and bill all accounts, even if the fee charged for water consumption is discounted or waived. Metering and billing all accounts ensures that water consumption is tracked and water waste from plumbing leaks is detected and minimized.
Unbilled unmetered:		Extent of unbilled, unmetered consumption is unknown due to unclear policies and poor recordkeeping. Total consumption is quantified based upon a purely subjective estimate.	Clear extent of unbilled, unmetered consumption is unknown, but a number of events are randomly documented each year, confirming existence of such consumption, but without sufficient documentation to quantify an accurate estimate of the annual volume consumed.	Conditions between 2 and 4	Extent of unbilled, unmetered consumption is partially known, and procedures exist to document certain events such as miscellaneous fire hydrant uses. Formulae is used to quantify the consumption from such events (time running multiplied by typical flowrate, multiplied by number of events).	Default value of 1.25% of system input volume is employed	Coherent policies exist for some forms of unbilled, unmetered consumption but others await closer evaluation. Reasonable recordkeeping for the managed uses exists and allows for annual volumes to be quantified by inference, but unsupervised uses are guesstimated.	Conditions between 6 and 8	Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events) or temporary meters, and relatively subjective estimates of less regulated use.	Conditions between 8 and 10	Clear policies exist to identify permitted use of water in unbilled, unmetered fashion, with the intention of minimizing this type of consumption. Good records document each occurrence and consumption is quantified via formulae (time running multiplied by typical flow, multiplied by number of events) or use of temporary meters.
Improvements to attain higher data grading for "Unbilled Unmetered Consumption" component:		to qualify for 5: Utilize the accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. to qualify for 2: Establish a policy regarding what water uses should be allowed to remain as unbilled and unmetered. Consider tracking a small sample of one such use (ex: fire hydrant flushings).	to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. to qualify for 4: Evaluate the documentation of events that have been observed. Meet with user groups (ex: for fire hydrants - fire departments, contractors to ascertain their need and/or volume requirements for water from fire hydrants).		to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process, and should focus on other components since the volume of unbilled, unmetered consumption is usually a relatively small quantity component, and other larger-quantity components should take priority.	to qualify for 6 or greater: Finalize policy and begin to conduct field checks to better establish and quantify such usage. Proceed if top-down audit exists and/or a great volume of such use is suspected.	to qualify for 8: Assess water utility policy and procedures for various unmetered usages. For example, ensure that a policy exists and permits are issued for use of fire hydrants by persons outside of the utility. Create written procedures for use and documentation of fire hydrants by water utility personnel. Use same approach for other types of unbilled, unmetered water usage.		to qualify for 10: Refine written procedures to ensure that all uses of unbilled, unmetered water are overseen by a structured permitting process managed by water utility personnel. Reassess policy to determine if some of these uses have value in being converted to billed and/or metered status.		to maintain 10: Continue to refine policy and procedures with intention of reducing the number of allowable uses of water in unbilled and unmetered fashion. Any uses that can feasibly become billed and metered should be converted eventually.

APPARENT LOSSES



Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Unauthorized consumption:		Extent of unauthorized consumption is unknown due to unclear policies and poor recordkeeping. Total unauthorized consumption is guesstimated.	Unauthorized consumption is a known occurrence, but its extent is a mystery. There are no requirements to document observed events, but periodic field reports capture some of these occurrences. Total unauthorized consumption is approximated from this limited data.	conditions between 2 and 4	Procedures exist to document some unauthorized consumption such as observed unauthorized fire hydrant openings. Use formulae to quantify this consumption (time running multiplied typical flowrate, multiplied by number of events).	Default value of 0.25% of volume of water supplied is employed	Coherent policies exist for some forms of unauthorized consumption (more than simply fire hydrant misuse) but others await closer evaluation. Reasonable surveillance and recordkeeping exist for occurrences that fall under the policy. Volumes quantified by inference from these records.	Conditions between 6 and 8	Clear policies and good auditable recordkeeping exist for certain events (ex: tampering with water meters, illegal bypasses of customer meters); but other occurrences have limited oversight. Total consumption is a combination of volumes from formulae (time x typical flow) and subjective estimates of unconfirmed consumption.	Conditions between 8 and 10	Clear policies exist to identify all known unauthorized uses of water. Staff and procedures exist to provide enforcement of policies and detect violations. Each occurrence is recorded and quantified via formulae (estimated time running multiplied by typical flow) or similar methods. All records and calculations should exist in a form that can be audited by a third party.
Improvements to attain higher data grading for "Unauthorized Consumption" component:		to qualify for 5: Use accepted default of 0.25% of volume of water supplied. to qualify for 2: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)	to qualify for 5: Use accepted default of 0.25% of system input volume to qualify for 4: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)		to qualify for 5: Utilize accepted default value of 0.25% of volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process.	to qualify for 6 or greater: Finalize policy updates to clearly identify the types of water consumption that are authorized from those usages that fall outside of this policy and are, therefore, unauthorized. Begin to conduct regular field checks. Proceed if the top-down audit already exists and/or a great volume of such use is suspected.	to qualify for 8: Assess water utility policies to ensure that all known occurrences of unauthorized consumption are outlawed, and that appropriate penalties are prescribed. Create written procedures for detection and documentation of various occurrences of unauthorized consumption as they are uncovered.		to qualify for 10: Refine written procedures and assign staff to seek out likely occurrences of unauthorized consumption. Explore new locking devices, monitors and other technologies designed to detect and thwart unauthorized consumption.		to maintain 10: Continue to refine policy and procedures to eliminate any loopholes that allow or tacitly encourage unauthorized consumption. Continue to be vigilant in detection, documentation and enforcement efforts.
Customer metering inaccuracies:	select n/a only if the entire customer population is unmetered. In such a case the volume entered must be zero.	Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is guesstimated.	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Conditions between 2 and 4	Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than just customer requests, but less than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.	Conditions between 4 and 6	A reliable electronic recordkeeping system for meters exists. The meter population includes a mix of new high performing meters and dated meters with suspect accuracy. Routine, but limited, meter accuracy testing and meter replacement occur. Inaccuracy volume is quantified using a mix of reliable and less certain data.	Conditions between 6 and 8	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for various types of meters.	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for these meters.	Good records of all active customer meters exist and include as a minimum: meter number, account number/location, type, size and manufacturer. Ongoing meter replacement occurs according to a targeted and justified basis. Regular meter accuracy testing gives a reliable measure of composite inaccuracy volume for the customer meter population. New metering technology is embraced to keep overall accuracy improving. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Customer meter inaccuracy volume" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.	to qualify for 4: Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.		to qualify for 6: Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.		to qualify for 8: Expand annual meter accuracy testing to evaluate a statistically significant number of meter makes/models. Expand meter replacement program to replace statistically significant number of poor performing meters each year.		to qualify for 9: Continue efforts to manage meter population with reliable recordkeeping. Test a statistically significant number of meters each year and analyze test results in an ongoing manner to serve as a basis for a target meter replacement strategy based upon accumulated volume throughput.	to qualify for 10: Continue efforts to manage meter population with reliable recordkeeping, meter testing and replacement. Evaluate new meter types and install one or more types in 5-10 customer accounts each year in order to pilot improving metering technology.	to maintain 10: Increase the number of meters tested and replaced as justified by meter accuracy test data. Continually monitor development of new metering technology and Advanced Metering Infrastructure (AMI) to grasp opportunities for greater accuracy in metering of water flow and management of customer consumption data.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Systematic Data Handling Errors:	Note: all water utilities incur some amount of this error. Even in water utilities with unmetered customer populations and fixed rate billing, errors occur in annual billing tabulations. Enter a positive value for the volume and select a grading.	Policies and procedures for activation of new customer water billing accounts are vague and lack accountability. Billing data is maintained on paper records which are not well organized. No auditing is conducted to confirm billing data handling efficiency. An unknown number of customers escape routine billing due to lack of billing process oversight.	Policy and procedures for activation of new customer accounts and oversight of billing records exist but need refinement. Billing data is maintained on paper records or insufficiently capable electronic database. Only periodic unstructured auditing work is conducted to confirm billing data handling efficiency. The volume of unbilled water due to billing lapses is a guess.	Conditions between 2 and 4	Policy and procedures for new account activation and oversight of billing operations exist but needs refinement. Computerized billing system exists, but is dated or lacks needed functionality. Periodic, limited internal audits conducted and confirm with approximate accuracy the consumption volumes lost to billing lapses.	Conditions between 4 and 6	Policy and procedures for new account activation and oversight of billing operations is adequate and reviewed periodically. Computerized billing system is in use with basic reporting available. Any effect of billing adjustments on measured consumption volumes is well understood. Internal checks of billing data error conducted annually. Reasonably accurate quantification of consumption volume lost to billing lapses is obtained.	Conditions between 6 and 8	New account activation and billing operations policy and procedures are reviewed at least biannually. Computerized billing system includes an array of reports to confirm billing data and system functionality. Checks are conducted routinely to flag and explain zero consumption accounts. Annual internal checks conducted with third party audit conducted at least once every five years. Accountability checks flag billing lapses. Consumption lost to billing lapses is well quantified and reducing year-by-year.	Conditions between 8 and 10	Sound written policy and procedures exist for new account activation and oversight of customer billing operations. Robust computerized billing system gives high functionality and reporting capabilities which are utilized, analyzed and the results reported each billing cycle. Assessment of policy and data handling errors are conducted internally and audited by third party at least once every three years, ensuring consumption lost to billing lapses is minimized and detected as it occurs.
Improvements to attain higher data grading for "Systematic Data Handling Error volume" component:		<u>to qualify for 2:</u> Draft written policy and procedures for activating new water billing accounts and oversight of billing operations. Investigate and budget for computerized customer billing system. Conduct initial audit of billing records by flow-charting the basic business processes of the customer account/billing function.	<u>to qualify for 4:</u> Finalize written policy and procedures for activation of new billing accounts and overall billing operations management. Implement a computerized customer billing system. Conduct initial audit of billing records as part of this process.		<u>to qualify for 6:</u> Refine new account activation and billing operations procedures and ensure consistency with the utility policy regarding billing, and minimize opportunity for missed billings. Upgrade or replace customer billing system for needed functionality - ensure that billing adjustments don't corrupt the value of consumption volumes. Procedurize internal annual audit process.		<u>to qualify for 8:</u> Formalize regular review of new account activation process and general billing practices. Enhance reporting capability of computerized billing system. Formalize regular auditing process to reveal scope of data handling error. Plan for periodic third party audit to occur at least once every five years.		<u>to qualify for 10:</u> Close policy/procedure loopholes that allow some customer accounts to go unbilled, or data handling errors to exist. Ensure that billing system reports are utilized, analyzed and reported every billing cycle. Ensure that internal and third party audits are conducted at least once every three years.		<u>to maintain 10:</u> Stay abreast of customer information management developments and innovations. Monitor developments of Advanced Metering Infrastructure (AMI) and integrate technology to ensure that customer endpoint information is well-monitored and errors/lapses are at an economic minimum.
<b>SYSTEM DATA</b>											
Length of mains:		Poorly assembled and maintained paper as-built records of existing water main installations makes accurate determination of system pipe length impossible. Length of mains is guesstimated.	Paper records in poor or uncertain condition (no annual tracking of installations & abandonments). Poor procedures to ensure that new water mains installed by developers are accurately documented.	Conditions between 2 and 4	Sound written policy and procedures exist for documenting new water main installations, but gaps in management result in an uncertain degree of error in tabulation of mains length.	Conditions between 4 and 6	Sound written policy and procedures exist for permitting and commissioning new water mains. Highly accurate paper records with regular field validation; or electronic records and asset management system in good condition. Includes system backup.	Conditions between 6 and 8	Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographic Information System (GIS) and asset management system are used to store and manage data.	Conditions between 8 and 10	Sound written policy exists for managing water mains extensions and replacements. Geographic Information System (GIS) data and asset management database agree and random field validation proves truth of databases. Records of annual field validation should be available for review.
Improvements to attain higher data grading for "Length of Water Mains" component:		<u>to qualify for 2:</u> Assign personnel to inventory current as-built records and compare with customer billing system records and highway plans in order to verify poorly documented pipelines. Assemble policy documents regarding permitting and documentation of water main installations by the utility and building developers; identify gaps in procedures that result in poor documentation of new water main installations.	<u>to qualify for 4:</u> Complete inventory of paper records of water main installations for several years prior to audit year. Review policy and procedures for commissioning and documenting new water main installation.		<u>to qualify for 6:</u> Finalize updates/improvements to written policy and procedures for permitting/commissioning new main installations. Confirm inventory of records for five years prior to audit year; correct any errors or omissions.		<u>to qualify for 8:</u> Launch random field checks of limited number of locations. Convert to electronic database such as a Geographic Information System (GIS) with backup as justified. Develop written policy and procedures.		<u>to qualify for 10:</u> Link Geographic Information System (GIS) and asset management databases, conduct field verification of data. Record field verification information at least annually.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve the completeness and accuracy of the system.
Number of active AND inactive service connections:		Vague permitting (of new service connections) policy and poor paper recordkeeping of customer connections/billings result in suspect determination of the number of service connections, which may be 10-15% in error from actual count.	General permitting policy exists but paper records, procedural gaps, and weak oversight result in questionable total for number of connections, which may vary 5-10% of actual count.	Conditions between 2 and 4	Written account activation policy and procedures exist, but with some gaps in performance and oversight. Computerized information management system is being brought online to replace dated paper recordkeeping system. Reasonably accurate tracking of service connection installations & abandonments; but count can be up to 5% in error from actual total.	Conditions between 4 and 6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Conditions between 6 and 8	Policies and procedures for new account activation and overall billing operations are written, well-structured and reviewed at least biannually. Well-managed computerized information management system exists and routine, periodic field checks and internal system audits are conducted. Counts of connections are no more than 2% in error.	Conditions between 8 and 10	Sound written policy and well managed and audited procedures ensure reliable management of service connection population. Computerized information management system, Customer Billing System, and Geographic Information System (GIS) information agree; field validation proves truth of databases. Count of connections recorded as being in error is less than 1% of the entire population.
Improvements to attain higher data grading for "Number of Active and Inactive Service Connections" component:	<b>Note: The number of Service Connections does not include fire hydrant leads/lines connecting the hydrant to the water main</b>	<u>to qualify for 2:</u> Draft new policy and procedures for new account activation and overall billing operations. Research and collect paper records of installations & abandonments for several years prior to audit year.	<u>to qualify for 4:</u> Refine policy and procedures for new account activation and overall billing operations. Research computerized recordkeeping system (Customer Information System or Customer Billing System) to improve documentation format for service connections.		<u>to qualify for 6:</u> Refine procedures to ensure consistency with new account activation and overall billing policy to establish new service connections or decommission existing connections. Improve process to include all totals for at least five years prior to audit year.		<u>to qualify for 8:</u> Formalize regular review of new account activation and overall billing operations policies and procedures. Launch random field checks of limited number of locations. Develop reports and auditing mechanisms for computerized information management system.		<u>to qualify for 10:</u> Close any procedural loopholes that allow installations to go undocumented. Link computerized information management system with Geographic Information System (GIS) and formalize field inspection and information system auditing processes. Documentation of new or decommissioned service connections encounters several levels of checks and balances.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve knowledge of system.
	Note: if customer water	Gradings 1-9 apply if customer properties are unmetered, if customer meters exist and are located inside the customer building premises, or if the water utility owns and is responsible for the entire service connection piping from the water main to the customer building. In any of these cases the average distance between the curb stop or boundary separating utility/customer responsibility for service connection piping, and the typical first point of use (ex: faucet) or the customer meter must be quantified. Gradings of 1-9 are used to grade the validity of the means to quantify this value. (See the "Service Connection Diagram" worksheet)									Either of two conditions can be met for a grading of 10:

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Average length of customer service line:	meters are located outside of the customer building next to the curb stop or boundary separating utility/customer responsibility, then the auditor should answer "Yes" to the question on the Reporting Worksheet asking about this. If the answer is Yes, the grading description listed under the Grading of 10(a) will be followed, with a value of zero automatically entered at a Grading of 10. See the Service Connection Diagram worksheet for a visual presentation of this distance.	Vague policy exists to define the delineation of water utility ownership and customer ownership of the service connection piping. Curb stops are perceived as the breakpoint but these have not been well-maintained or documented. Most are buried or obscured. Their location varies widely from site-to-site, and estimating this distance is arbitrary due to the unknown location of many curb stops.	Policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. The piping from the water main to the curb stop is the property of the water utility; and the piping from the curb stop to the customer building is owned by the customer. Curb stop locations are not well documented and the average distance is based upon a limited number of locations measured in the field.	Conditions between 2 and 4	Good policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. Curb stops are generally installed as needed and are reasonably documented. Their location varies widely from site-to-site, and an estimate of this distance is hindered by the availability of paper records of limited accuracy.	Conditions between 4 and 6	Clear written policy exists to define utility/customer responsibility for service connection piping. Accurate, well-maintained paper or basic electronic recordkeeping system exists. Periodic field checks confirm piping lengths for a sample of customer properties.	Conditions between 6 and 8	Clearly worded policy standardizes the location of curb stops and meters, which are inspected upon installation. Accurate and well maintained electronic records exist with periodic field checks to confirm locations of service lines, curb stops and customer meter pits. An accurate number of customer properties from the customer billing system allows for reliable averaging of this length.	Conditions between 8 and 10	a) Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer "Yes" to the question on the Reporting Working asking about this condition. A value of zero and a Grading of 10 are automatically entered in the Reporting Worksheet . b). Meters exist inside customer buildings, or properties are unmetered. In either case, answer "No" to the Reporting Worksheet question on meter location, and enter a distance determined by the auditor. For a Grading of 10 this value must be a very reliable number from a Geographic Information System (GIS) and confirmed by a statistically valid number of field checks.
Improvements to attain higher data grading for "Average Length of Customer Service Line" component:		<u>to qualify for 2:</u> Research and collect paper records of service line installations. Inspect several sites in the field using pipe locators to locate curb stops. Obtain the length of this small sample of connections in this manner.	<u>to qualify for 4:</u> Formalize and communicate policy delineating utility/customer responsibilities for service connection piping. Assess accuracy of paper records by field inspection of a small sample of service connections using pipe locators as needed. Research the potential migration to a computerized information management system to store service connection data.		<u>to qualify for 6:</u> Establish coherent procedures to ensure that policy for curb stop, meter installation and documentation is followed. Gain consensus within the water utility for the establishment of a computerized information management system.		<u>to qualify for 8:</u> Implement an electronic means of recordkeeping, typically via a customer information system, customer billing system, or Geographic Information System (GIS). Standardize the process to conduct field checks of a limited number of locations.		<u>to qualify for 10:</u> Link customer information management system and Geographic Information System (GIS), standardize process for field verification of data.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve knowledge of service connection configurations and customer meter locations.
Average operating pressure:		Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain, high system head loss and weak/erratic pressure controls further compromise the validity of the average pressure calculation.	Limited telemetry monitoring of scattered pumping station and water storage tank sites provides some static pressure data, which is recorded in handwritten logbooks. Pressure data is gathered at individual sites only when low pressure complaints arise. Average pressure is determined by averaging relatively crude data, and is affected by significant variation in ground elevations, system head loss and gaps in pressure controls in the distribution system.	Conditions between 2 and 4	Effective pressure controls separate different pressure zones; moderate pressure variation across the system; occasional open boundary valves are discovered that breach pressure zones. Basic telemetry monitoring of the distribution system logs pressure data electronically. Pressure data gathered by gauges or dataloggers at fire hydrants or buildings when low pressure complaints arise, and during fire flow tests and system flushing. Reliable topographical data exists. Average pressure is calculated using this mix of data.	Conditions between 4 and 6	Reliable pressure controls separate distinct pressure zones; only very occasional open boundary valves are encountered that breach pressure zones. Well-covered telemetry monitoring of the distribution system (not just pumping at source treatment plants or wells) logs extensive pressure data electronically. Pressure gathered by gauges/dataloggers at fire hydrants and buildings when low pressure complaints arise, and during fire flow tests and system flushing. Average pressure is determined by using this mix of reliable data.	Conditions between 6 and 8	Well-managed, discrete pressure zones exist with generally predictable pressure fluctuations. A current full-scale SCADA System or similar realtime monitoring system exists to monitor the water distribution system and collect data, including real time pressure readings at representative sites across the system. The average system pressure is determined from reliable monitoring system data.	Conditions between 8 and 10	Well-managed pressure districts/zones, SCADA System and hydraulic model exist to give very precise pressure data across the water distribution system. Average system pressure is reliably calculated from extensive, reliable, and cross-checked data. Calculations are reported on an annual basis as a minimum.
Improvements to attain higher data grading for "Average Operating Pressure" component:		<u>to qualify for 2:</u> Employ pressure gauging and/or datalogging equipment to obtain pressure measurements from fire hydrants. Locate accurate topographical maps of service area in order to confirm ground elevations. Research pump data sheets to find pump pressure/flow characteristics	<u>to qualify for 4:</u> Formalize a procedure to use pressure gauging/datalogging equipment to gather pressure data during various system events such as low pressure complaints, or operational testing. Gather pump pressure and flow data at different flow regimes. Identify faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) and plan to properly configure pressure zones. Make all pressure data from these efforts available to generate system-wide average pressure.		<u>to qualify for 6:</u> Expand the use of pressure gauging/datalogging equipment to gather scattered pressure data at a representative set of sites, based upon pressure zones or areas. Utilize pump pressure and flow data to determine supply head entering each pressure zone or district. Correct any faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) to ensure properly configured pressure zones. Use expanded pressure dataset from these activities to generate system-wide average pressure.		<u>to qualify for 8:</u> Install a Supervisory Control and Data Acquisition (SCADA) System, or similar realtime monitoring system, to monitor system parameters and control operations. Set regular calibration schedule for instrumentation to insure data accuracy. Obtain accurate topographical data and utilize pressure data gathered from field surveys to provide extensive, reliable data for pressure averaging.		<u>to qualify for 10:</u> Annually, obtain a system-wide average pressure value from the hydraulic model of the distribution system that has been calibrated via field measurements in the water distribution system and confirmed in comparisons with SCADA System data.		<u>to maintain 10:</u> Continue to refine the hydraulic model of the distribution system and consider linking it with SCADA System for realtime pressure data calibration, and averaging.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
<b>COST DATA</b>											
Total annual cost of operating water system:		Incomplete paper records and lack of financial accounting documentation on many operating functions makes calculation of water system operating costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to estimate the major portion of water system operating costs.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. However, gaps in data are known to exist, periodic internal reviews are conducted but not a structured financial audit.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited periodically by utility personnel, but not a Certified Public Accountant (CPA).	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited at least annually by utility personnel, and at least once every three years by third-party CPA.	Conditions between 8 and 10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.
Improvements to attain higher data grading for "Total Annual Cost of Operating the Water System" component:		<u>to qualify for 2:</u> Gather available records, institute new financial accounting procedures to regularly collect and audit basic cost data of most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Establish process for periodic internal audit of water system operating costs; identify cost data gaps and institute procedures for tracking these outstanding costs.		<u>to qualify for 8:</u> Standardize the process to conduct routine financial audit on an annual basis. Arrange for CPA audit of financial records at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and long-term cost trend, and budget/track costs proactively
Customer retail unit cost (applied to Apparent Losses):	Customer population unmetered, and/or only a fixed fee is charged for consumption.	Antiquated, cumbersome water rate structure is used, with periodic historic amendments that were poorly documented and implemented; resulting in classes of customers being billed inconsistent charges. The actual composite billing rate likely differs significantly from the published water rate structure, but a lack of auditing leaves the degree of error indeterminate.	Dated, cumbersome water rate structure, not always employed consistently in actual billing operations. The actual composite billing rate is known to differ from the published water rate structure, and a reasonably accurate estimate of the degree of error is determined, allowing a composite billing rate to be quantified.	Conditions between 2 and 4	Straight-forward water rate structure in use, but not updated in several years. Billing operations reliably employ the rate structure. The composite billing rate is derived from a single customer class such as residential customer accounts, neglecting the effect of different rates from varying customer classes.	Conditions between 4 and 6	Clearly written, up-to-date water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average residential rate using volumes of water in each rate block.	Conditions between 6 and 8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate, which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Conditions between 8 and 10	Current, effective water rate structure is in force and applied reliably in billing operations. The rate structure and calculations of composite rate - which includes residential, commercial, industrial, institutional (CII), and other distinct customer classes - are reviewed by a third party knowledgeable in the M36 methodology at least once every five years.
Improvements to attain higher data grading for "Customer Retail Unit Cost" component:		<u>to qualify for 2:</u> Formalize the process to implement water rates, including a secure documentation procedure. Create a current, formal water rate document and gain approval from all stakeholders.	<u>to qualify for 4:</u> Review the water rate structure and update/formalize as needed. Assess billing operations to ensure that actual billing operations incorporate the established water rate structure.		<u>to qualify for 6:</u> Evaluate volume of water used in each usage block by residential users. Multiply volumes by full rate structure.	<u>Launch effort to fully meter the customer population and charge rates based upon water volumes</u>	<u>to qualify for 8:</u> Evaluate volume of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to qualify for 10:</u> Conduct a periodic third-party audit of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to maintain 10:</u> Keep water rate structure current in addressing the water utility's revenue needs. Update the calculation of the customer unit rate as new rate components, customer classes, or other components are modified.
Variable production cost (applied to Real Losses):	Note: if the water utility purchases/imports its entire water supply, then enter the unit purchase cost of the bulk water supply in the Reporting Worksheet with a grading of 10	Incomplete paper records and lack of documentation on primary operating functions (electric power and treatment costs most importantly) makes calculation of variable production costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to roughly estimate the basic operations costs (pumping power costs and treatment costs) and calculate a unit variable production cost.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. Electric power and treatment costs are reliably tracked and allow accurate weighted calculation of unit variable production costs based on these two inputs and water imported purchase costs (if applicable). All costs are audited internally on a periodic basis.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent primary and secondary variable production and water imported purchase (if applicable) costs tracked. The data is audited at least annually by utility personnel, and at least once every three years by a third-party knowledgeable in the M36 methodology.	Conditions between 8 and 10	Either of two conditions can be met to obtain a grading of 10: 1) Third party CPA audit of all pertinent primary and secondary variable production and water imported purchase (if applicable) costs on an annual basis. or: 2) Water supply is entirely purchased as bulk water imported, and the unit purchase cost - including all applicable marginal supply costs - serves as the variable production cost. If all applicable marginal supply costs are not included in this figure, a grade of 10 should <u>not</u> be selected.
Improvements to attain higher data grading for "Variable Production Cost" component:		<u>to qualify for 2:</u> Gather available records, institute new procedures to regularly collect and audit basic cost data and most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Formalize process for regular internal audits of production costs. Assess whether additional costs (liability, residuals management, equipment wear, impending infrastructure expansion) should be included to calculate a more representative variable production cost.		<u>to qualify for 8:</u> Formalize the accounting process to include direct cost components (power, treatment) as well as indirect cost components (liability, residuals management, etc.) Arrange to conduct audits by a knowledgeable third-party at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and budget/track costs proactively



## AWWA Free Water Audit Software: Determining Water Loss Standing

WAS v5.0

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Water Audit Report for: **Groveland Community Services District (CA5510009)**  
 Reporting Year: **2019**    1/2019 - 12/2019  
 Data Validity Score: **64**

### Water Loss Control Planning Guide

Water Audit Data Validity Level / Score					
Functional Focus Area	Level I (0-25)	Level II (26-50)	Level III (51-70)	Level IV (71-90)	Level V (91-100)
Audit Data Collection	Launch auditing and loss control team; address production metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs. Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table)	Performance Benchmarking - ILI is meaningful in comparing real loss standing	Identify Best Practices/ Best in class - the ILI is very reliable as a real loss performance indicator for best in class service

*For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.*

Once data have been entered into the Reporting Worksheet, the performance indicators are automatically calculated. How does a water utility operator know how well his or her system is performing? The AWWA Water Loss Control Committee provided the following table to assist water utilities in gauging an approximate Infrastructure Leakage Index (ILI) that is appropriate for their water system and local conditions. The lower the amount of leakage and real losses that exist in the system, then the lower the ILI value will be.

**Note:** this table offers an approximate guideline for leakage reduction target-setting. The best means of setting such targets include performing an economic assessment of various loss control methods. However, this table is useful if such an assessment is not possible.

**General Guidelines for Setting a Target ILI  
(without doing a full economic analysis of leakage control options)**

Target ILI Range	Financial Considerations	Operational Considerations	Water Resources Considerations
<b>1.0 - 3.0</b>	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulation or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
<b>&gt;3.0 - 5.0</b>	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions (leakage management, water conservation) are included in the long-term
<b>&gt;5.0 - 8.0</b>	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
<b>Greater than 8.0</b>	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective utilization of water as a resource. Setting a target level greater than 8.0 - other than as an incremental goal to a smaller long-term target - is discouraged.		
<b>Less than 1.0</b>	If the calculated Infrastructure Leakage Index (ILI) value for your system is 1.0 or less, two possibilities exist. a) you are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control. b) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI value but do not employ extensive leakage control practices in your operations. In such cases it is beneficial to validate the data by performing field measurements to confirm the accuracy of production and customer meters, or to identify any other potential sources of error in the data.		

**APPENDIX E**  
**SB X7-7 COMPLIANCE FORM**

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**SB X7-7 Table 0: Units of Measure Used in 2020 UWMP\***

*(select one from the drop down list)*

Million Gallons

*\*The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*

NOTES:



**SB X7-7 Table 2: Method for 2020 Population Estimate**

**Method Used to Determine 2020 Population**  
(may check more than one)

<input checked="" type="checkbox"/>	<b>1. Department of Finance (DOF) or American Community Survey (ACS)</b>
<input type="checkbox"/>	<b>2. Persons-per-Connection Method</b>
<input type="checkbox"/>	<b>3. DWR Population Tool</b>
<input type="checkbox"/>	<b>4. Other</b> DWR recommends pre-review

NOTES:

**SB X7-7 Table 3: 2020 Service Area Population**

**2020 Compliance Year Population**

<b>2020</b>	3,029
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NOTES:

**SB X7-7 Table 4: 2020 Gross Water Use**

Compliance Year 2020	2020 Volume Into Distribution System <i>This column will remain blank until SB X7-7 Table 4-A is completed.</i>	2020 Deductions					2020 Gross Water Use
		Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water <i>This column will remain blank until SB X7-7 Table 4-B is completed.</i>	Water Delivered for Agricultural Use*	Process Water <i>This column will remain blank until SB X7-7 Table 4-D is completed.</i>	
	130	-	-	-	-	-	130

\* Units of measure (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

**Name of Source** Groveland CSD WTP

**This water source is (check one):**

The supplier's own water source

A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System <sup>1</sup>	Meter Error Adjustment <sup>2</sup> <i>Optional</i> (+/-)	Corrected Volume Entering Distribution System
	130	-	130

<sup>1</sup> **Units of measure (AF, MG, or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

<sup>2</sup> **Meter**

**Error Adjustment** - See guidance in Methodology 1, Step 3 of Methodologies Document

NOTES

**SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction** (For use only by agencies that are deducting indirect recycled water)

2020 Compliance Year	2020 Surface Reservoir Augmentation				2020 Groundwater Recharge			Total Deductible Volume of Indirect Recycled Water Entering the Distribution System	
	Volume Discharged from Reservoir for Distribution System Delivery <sup>1</sup>	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission/Treatment Loss <sup>1</sup>	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility <sup>1,2</sup>	Transmission/Treatment Losses <sup>1</sup>		Recycled Volume Entering Distribution System from Groundwater Recharge
			-		-			-	-

<sup>1</sup> Units of measure (AF, MG, or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3. <sup>2</sup>  
 Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.

Data from this table will not be entered into WUEdata.  
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility**  
**(For use only by agencies that are deducting process water) Choose Only One**

<input type="checkbox"/>	<b>Criteria 1-</b> Industrial water use is equal to or greater than 12% of gross water use. Complete SB X7-7 Table 4-C.1
<input type="checkbox"/>	<b>Criteria 2</b> - Industrial water use is equal to or greater than 15 GPCD. Complete SB X7-7 Table 4-C.2
<input type="checkbox"/>	<b>Criteria 3</b> - Non-industrial use is equal to or less than 120 GPCD. Complete SB X7-7 Table 4-C.3
<input checked="" type="checkbox"/>	<b>Criteria 4</b> - Disadvantaged Community. Complete SB x7-7 Table 4-C.4

NOTES:

Data from this table will not be entered into WUEdata.  
 Instead, the entire table will be uploaded to WUEdata as a separate upload in  
 Excel format.

**SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 1)*

**Criteria 1**  
 Industrial water use is equal to or greater than 12% of gross water use

2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction	2020 Industrial Water Use	Percent Industrial Water	Eligible for Exclusion Y/N
	130		0%	NO

NOTES:

Data from this table will not be entered into WUEdata.  
 Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel  
 format.

**SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 2)*

**Criteria 2**  
 Industrial water use is equal to or greater than 15 GPCD

2020 Compliance Year	2020 Industrial Water Use	2020 Population	2020 Industrial GPCD	Eligible for Exclusion Y/N
		3,029	-	NO

NOTES:



Data from this table will not be entered into WUEdata.  
 Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 3)*

**Criteria 3**  
 Non-industrial use is equal to or less than 120 GPCD

2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction <i>Fm SB X7-7 Table 4</i>	2020 Industrial Water Use	2020 Non-industrial Water Use	2020 Population <i>Fm SB X7-7 Table 3</i>	Non-Industrial GPCD	Eligible for Exclusion Y/N
	130	-	130	3,029	117	YES

NOTES:

Data from this table will not be entered into WUEdata.  
 Instead, the entire table will be uploaded to WUEdata as a separate upload in  
 Excel format.

**SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 4)*

**Criteria 4**

Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

**SELECT ONE**

"Disadvantaged Community" status was determined using one of the methods listed below:

**1. IRWM DAC Mapping tool <https://gis.water.ca.gov/app/dacs/>**

If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC.

**2. 2020 Median Income**

	California Median Household Income*		Service Area Median Household Income	Percentage of Statewide Average	Eligible for Exclusion? Y/N
	<input checked="" type="checkbox"/>	<b>2020</b>	<b>\$75,235</b>	56,667	75%
*California median household income 2015 -2019 as reported in US Census Bureau QuickFacts.					

NOTES

Data from these tables will not be entered into WUEdata. Instead,  
the entire tables will be uploaded to WUEdata as a separate upload in Excel format.

This table(s) is only for Suppliers that deduct process water from their 2020 gross water use.

**SB X7-7 Table 4-D: 2020 Process Water Deduction - Volume** *Complete a separate table for each industrial customer with a process water exclusion*

Name of Industrial Customer		<i>Enter Name of Industrial Customer 1</i>			
Compliance Year 2020	Industrial Customer's Total Water Use *	Total Volume Provided by Supplier*	% of Water Provided by Supplier	Customer's Total Process Water Use*	Volume of Process Water Eligible for Exclusion for this Customer
					-

\* **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

**SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)**

<b>2020 Gross Water <i>Fm SB X7-7 Table 4</i></b>	<b>2020 Population <i>Fm</i> <i>SB X7-7 Table 3</i></b>	<b>2020 GPCD</b>
130	3,029	<b>117</b>

NOTES:

**SB X7-7 Table 9: 2020 Compliance**

Actual 2020 GPCD <sup>1</sup>	Optional Adjustments to 2020 GPCD					2020 Confirmed Target GPCD <sup>1, 2</sup>	Did Supplier Achieve Targeted Reduction for 2020?
	Enter "0" if Adjustment Not Used			TOTAL Adjustments <sup>1</sup>	Adjusted 2020 GPCD <sup>1</sup> <i>(Adjusted if applicable)</i>		
	Extraordinary Events <sup>1</sup>	Weather Normalization <sup>1</sup>	Economic Adjustment <sup>1</sup>				
117	0	-	12	12	105	107	YES

<sup>1</sup> All values are reported in GPCD

<sup>2</sup> **2020 Confirmed Target GPCD** is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.

NOTES:

The 2020 total adjustments include 0.27 GPCD for water used for fire suppression in 2020 and 11.91 GPCD for the amount of additional water that was used by vacation homes and rentals during the 2020 COVID-19 pandemic.

**APPENDIX F**  
**CONTRACT BETWEEN THE GROVELAND COMMUNITY SERVICES**  
**DISTRICT AND CITY AND COUNTY OF SAN FRANCISCO FOR WATER**  
**SERVICES**

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CONTRACT BETWEEN  
GROVELAND COMMUNITY SERVICES DISTRICT  
AND  
CITY AND COUNTY OF SAN FRANCISCO  
FOR WATER SERVICE

THIS CONTRACT, entered into as of this first day of January 1984, by and between the GROVELAND COMMUNITY SERVICES DISTRICT (District) and the CITY AND COUNTY OF SAN FRANCISCO, a municipal corporation (City), acting through its PUBLIC UTILITIES COMMISSION.

RECITALS:

1. Under an existing contract dated March 23, 1965 (1965 contract), City agreed to furnish water to the District at the Second Garrotte Shaft of City's Hetch Hetchy Aqueduct in Tuolumne County, California, for a term of 51 years, with a termination date of March 23, 2016.
2. Under Amendment No. 1 to the 1965 Contract, dated January 9, 1968, the term of the 1965 Contract was extended to 55 years, with a termination date of March 23, 2020.
3. Under Amendment No. 2 to the 1965 Contract, dated May 18, 1971, City agreed to furnish water to the District at a second point of delivery at the Big Creek Shaft of City's Hetch Hetchy Aqueduct in Tuolumne County, California. Granting of access to rights of way owned by City needed by the District for installing, constructing, operating and maintaining additional facilities of District's water supply system was provided. A surcharge of ten percent applied to all bills for water service was established for the purpose of compensating City on loss of power revenues as a result of furnishing water service to the District.

4. Since the 1965 Contract, the District has expanded the boundary of its water supply service area in order to meet the water needs of a growing population in the Groveland area of Tuolumne County, California.

5. District has requested City's review of the reasonableness of the existing rates for water service as well as the surcharge for loss of power.

6. Both City and District desire to continue the arrangement whereby City provides the necessary water supply that the District requires to meet the demands of its service area.

7. Because of the changes in District's system, together with those in City's system since the 1965 Contract, City and District recognize that certain terms and conditions of the 1965 Contract, as amended, need to be reviewed, adjusted and revised.

NOW, THEREFORE, it is mutually agreed that the 1965 Contract, as amended, shall be modified in its entirety as follows:

1. LOCATION AND DESCRIPTION OF SERVICE CONNECTION

Sale and delivery of water to the District by City will be made at the Second Garrotte Shaft and the Big Creek Shaft of City's Hetch Hetchy Aqueduct in Tuolumne County, California, at the locations shown on Exhibit A, attached herewith and made a part hereof.

2. SCOPE OF CONTRACT

Subject to the terms and conditions hereinafter set forth, City shall sell and deliver to the District and the District shall purchase and receive from City all water service, supplemental to sources and supplies owned or controlled by the District, in sufficient quantity to supply the total water needs of the service area shown on Exhibit A.



3. TERM OF CONTRACT

3.1 Except as provided by Paragraphs 3.2 and 3.3 herein, this contract shall continue in effect until midnight, March 23, 2034.

3.2 This contract may be terminated by the District upon written notice to City 30 days in advance of such termination.

3.3 Upon termination as provided by Paragraph 3.1 herein, this contract may be extended by mutual consent of the parties, subject to any modifications thereof which may be determined at said time. If no such extension takes place or in the absence of any new contract, the District shall be guaranteed thereafter only that quantity of water which it received during Calendar Year 2020, as limited by the safe capacity of the Hetch Hetchy Aqueduct to furnish water to the District, and at the then effective rates and charges together with any increases as is set forth in Paragraph 11 herein. Prior to or upon termination of this contract, the parties shall, in good faith, promptly negotiate an extension of this contract or a new contract.

4. SERVICE SPECIFICATIONS

4.1 Water to be furnished by City under this contract shall be delivered to the District at the available pressure carried in the Hetch Hetchy Aqueduct at the Second Garrotte Shaft and the Big Creek Shaft. It is understood that said pressure is subject to variations associated with the operation of City's aqueduct and that City shall not be responsible for any effect of such variations on the water service to the District.

4.2 The District shall assume all responsibility for adequate treatment of the water purchased hereunder to render it potable and safe for domestic use and shall indemnify and hold the City harmless against any and all liabilities resulting from the quality of water furnished.

5. CONDITIONS OF SALE

The District agrees not to sell any water purchased from City to any private party for resale by such private party to others. The District further agrees not to sell, without prior written approval of City, any water from any source whatsoever to any private party for resale by substituting therefor water purchased from City. The District agrees that no water furnished by City to the District shall be delivered by the District outside the boundary of the District's service area. The District further agrees not to deliver any water outside the boundary of the District's service area by substituting therefor water purchased from City, unless written consent for such delivery is entered into by the District and City.

6. DISTRICT'S FACILITIES

6.1 The District, at its expense, will furnish, construct, operate and maintain all supply lines, pumps and other facilities it may require (hereinafter collectively referred to as "facilities") to transmit and distribute all water received by it at the place or places of delivery. All such facilities shall be and remain the sole property of the District.

6.2 Prior to the construction or installation of any structure or facility by the District, or any of its agents, on any property, right-of-way or easement of which title or rights are vested in the City or in or adjacent to the tunnel or-shaft of the Hetch Hetchy Aqueduct, detail plans and specifications of such structures and facilities and the proposed construction procedures and safety precautions to be followed shall be submitted to the City for written approval. No construction of such structures or facilities shall commence prior to the receipt of such approval.

7. USE OF CITY'S PREMISES

As a part of this contract and for the purpose of access to install, construct, operate, repair and maintain necessary supply lines, pumps and other facilities of District's water system required to be located on City's premises,

permission is hereby granted to the District, free of any rental or similar charges, to occupy and utilize property or premises of City as shown on Exhibits "B" and "B-1", attached hereto and made a part hereof. This permit is granted subject to the following conditions:

- (a) Permission for said occupancy and use shall continue until the termination of this contract and for a reasonable time thereafter, sufficient to allow for the removal by the District of its facilities. Upon completion of removal by the District of its facilities, said permit expires. No interest in real property is created in the District by virtue of this contract, but only permission to use said property as an incident to performance of this contract is conferred.
- (b) No structures of any kind, except those expressly permitted, shall be erected or placed thereon.
- (c) The District shall, at all times, keep City's property in good and sightly condition, so far as it may be affected by District's operations hereunder.
- (d) All work performed by the District under this permit shall be strictly in conformance with the safety orders of the California State Division of Industrial Safety and other pertinent Federal and State regulations.
- (e) A minimum of maintenance work is performed on City's private access roads to Second Garrotte Shaft and Big Creek Shaft. Any additional maintenance or construction work on said roads which may be required for use by the District for District's access and

operation under the contract shall be performed by the District at its expense and subject to the approval of City.

(f) Authorized representatives of the District, its contractors and subcontractors will be allowed access to District's facilities at suitable times to perform the obligations of the District with respect to such facilities.

(g) The District shall, on receipt of notice so to do and within such reasonable time limit as may be fixed by said notice, alter or remove, at the expense of the District, any property or structure covered by this permit, to such extent as may be necessary to avoid or eliminate interference with any pipe, pipe lines, power lines or other structures now constructed or hereafter to be constructed by City, or with any operation of City, or with any use by City of the land affected hereby.

#### 8. CONTINUITY OF SERVICE AND CONSUMPTION

8.1 City shall use all reasonable diligence in providing a constant and uninterrupted supply of water. The City, however, shall not be liable to the District hereunder, nor shall the District be liable to City hereunder, by reason of failure of City to deliver or the District to receive water as the result of fire, strike, riot, explosion, flood, earthquake, accident, breakdown, temporary interruptions due to normal operations, acts of God or the public enemy, or other acts beyond the control of the party affected. It is the intention of each party to relieve the other of the obligation to supply water or to receive and pay for water when, as a result of any of the above-mentioned causes, either party may be unable to deliver or use, in whole or in part, the water herein contracted to be delivered and received. This provision shall not be construed to relieve the District of liability for payment of water delivered at the meter but not beneficially used.

8.2 City shall have the right, at any and all times, to shut off the water from its aqueduct for the purpose of making inspections, repairs, extensions, alterations and for any other purpose necessary or desirable for the proper operation and maintenance of the aqueduct. Insofar as possible, reasonable notice shall be given by City to the District of any such scheduled or emergency shutdowns.

8.3 It is understood that it will be the responsibility of the District to safeguard its water supply by providing adequate storage facilities or an alternate source of supply.

8.4 The water use projections made by the District for the term of this contract are shown on Exhibit C, attached hereto and made a part hereof. Insofar as possible, reasonable notice shall be given by the District to City if the rate and quantity of water to be purchased deviates significantly from said estimates.

9. MEASUREMENT OF WATER

9.1 The water supplied hereunder shall be measured by suitable metering equipment to be furnished, installed, maintained and calibrated by City at its expense. All such equipment shall be and remain the property of City. When more than a single meter is installed in a battery, the readings thereof shall be billed conjunctively. A standby emergency meter shall be installed for emergency demand or for bypass maintenance operation. No service charge shall be made for standby emergency meter.

9.2 City shall read all meters at its expense and, as far as possible, shall read all meters at periodic intervals of approximately thirty (30) days.

9.3 In the event any meter fails to register or registers incorrectly, a daily average will be obtained from the reading of such meter taken for the previous period when the meter was shown to be operating correctly, or from the reading of a new substitute meter known to be correct, or from other information which shall

render a fair daily average. The daily average thus obtained shall be used as a basis of payment for the period that such meter was out of order, the length of such period to be determined by agreement between the parties. When it becomes known to City that a meter fails to register, or registers incorrectly, City shall thereupon take the necessary corrective action.

10. METER TEST

10.1 At the written request of the District, City shall test, in the presence of District representatives, any or all meters installed by City. The cost, if any, of such tests shall be borne by the District if the percentage of error is found to be not more than two (2) percent slow or fast. No meter shall be placed in service or allowed to remain in service which has an error in registration in excess of two (2) percent slow or fast.

10.2 If upon test, any meter shall be found to register in excess of two (2) percent slow or fast, corrections shall be made accordingly in the amount charged for water passing through such meter, but no such correction shall extend beyond twelve (12) months previous to the day on which such inaccuracy is discovered by said test.

11. RATES AND CHARGES

11.1 The charges to be paid by District to City for providing the water service hereunder shall be:

- (a) Service Charge: \$75.00 per service location
- (b) Charge for Water Delivered: 7.12 cents per hundred cubic feet
- (c) Surcharge for Power Loss: 9.81 cents per hundred cubic feet

11.2 If City should fail to provide a constant and uninterrupted supply of water at a point of delivery for a continuous period of more than forty-eight (48)

hours during any monthly period hereunder, the service charge specified in Paragraph 11.1(a) shall be prorated for such monthly period on the basis of an average monthly period of thirty (30) days.

11.3 No reduction in charge specified in Paragraph 11.1(b) will be made by City because of the cost to District of raising water from City's aqueduct tunnel. The District will be held responsible for payment for all water passing through City's meters, whether the water has been beneficially used by the District or lost through leakage in its supply lines or fixtures.

11.4 The surcharge specified in Paragraph 11.1(c) is for the purpose of compensating City for reduction in electric generation at its Moccasin Powerhouse due to the reduced amount of water available for this purpose as a result of furnishing water service to the District hereunder.

11.5 Pursuant to the methodology as shown on Exhibit D, attached hereto and made a part hereof, the service charge and the charge for water delivered as provided in Paragraphs 11.1(a) and 11.1(b) shall be adjusted every four (4) years effective July 1, 1987 and every four (4) years thereafter for the term of this contract. For the purpose of this provision, the rates and charges as specified in Paragraphs 11.1(a) and 11.1(b) shall be deemed to be effective for the year beginning July 1, 1983.

11.6 Pursuant to the methodology as shown on Exhibit E, attached hereto and made a part hereof, the surcharge for power loss as provided in Paragraph 11.1(c) shall be adjusted every four (4) years effective July 1, 1987 and every four (4) years thereafter for the term of this contract. For the purpose of this provision, the surcharge as specified in Paragraph 11.1(c) shall be deemed to be effective for the year beginning July 1, 1983.

12. PAYMENTS

Payments for the service furnished hereunder shall be made monthly upon submission of invoices rendered by City to the District. Such invoices shall contain statements of the meter readings at the beginning and end of the monthly period and monthly consumption.

13. NOTICE OF NONRESPONSIBILITY

Except in instances of emergency requiring immediate work, the District agrees that it will notify City at least ten days before starting any construction work, repairs or alterations on any property, right-of-way or easement of which title or rights are vested in the City, in order that City may post appropriate notices of nonresponsibility. The District shall, at all times, permit such notices to remain posted for the time required by law.

14. LIABILITY

14.1 The District shall indemnify and hold harmless the City and all officers, servants, agents and employees of City from any loss or liability to third persons arising from any property damage, personal injury or death due directly or indirectly to the operations of the District or uses of City's property by the District or its agents under this contract.

14.2 The District shall be held liable for any and all damages to water meters and other property of City which may be willfully caused by or result from carelessness or negligence on the part of the District or its agents or employees.

15. THIRD PARTY INTERESTS AND ASSIGNMENTS


15.1 This contract is not for the benefit of any person, corporation or entity other than the parties hereto. No person, corporation or entity other than the parties hereto shall have any rights or interest in or under this contract, except as expressly provided herein.



15.2 Neither this contract, nor any interest herein, nor any claim arising hereunder shall be transferred or assigned by the District to any party or parties without the prior written consent of City.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

THE CITY AND COUNTY OF SAN FRANCISCO  
By Its Public Utilities Commission

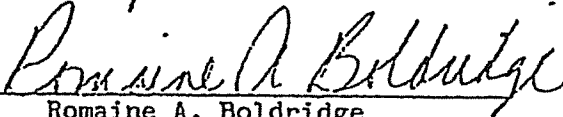
By   
Rudolf Nothenberg  
General Manager of Public Utilities

ATTEST:


Authorized by Public Utilities Commission  
City and County of San Francisco

Resolution No. 84-0186


Adopted: April 24, 1984

  
Romaine A. Boldridge  
Secretary

Approved as to form:  
George Agnost  
City Attorney

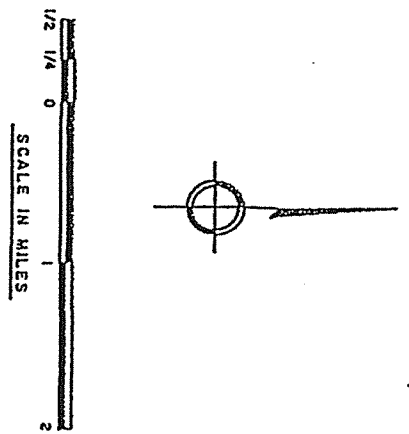
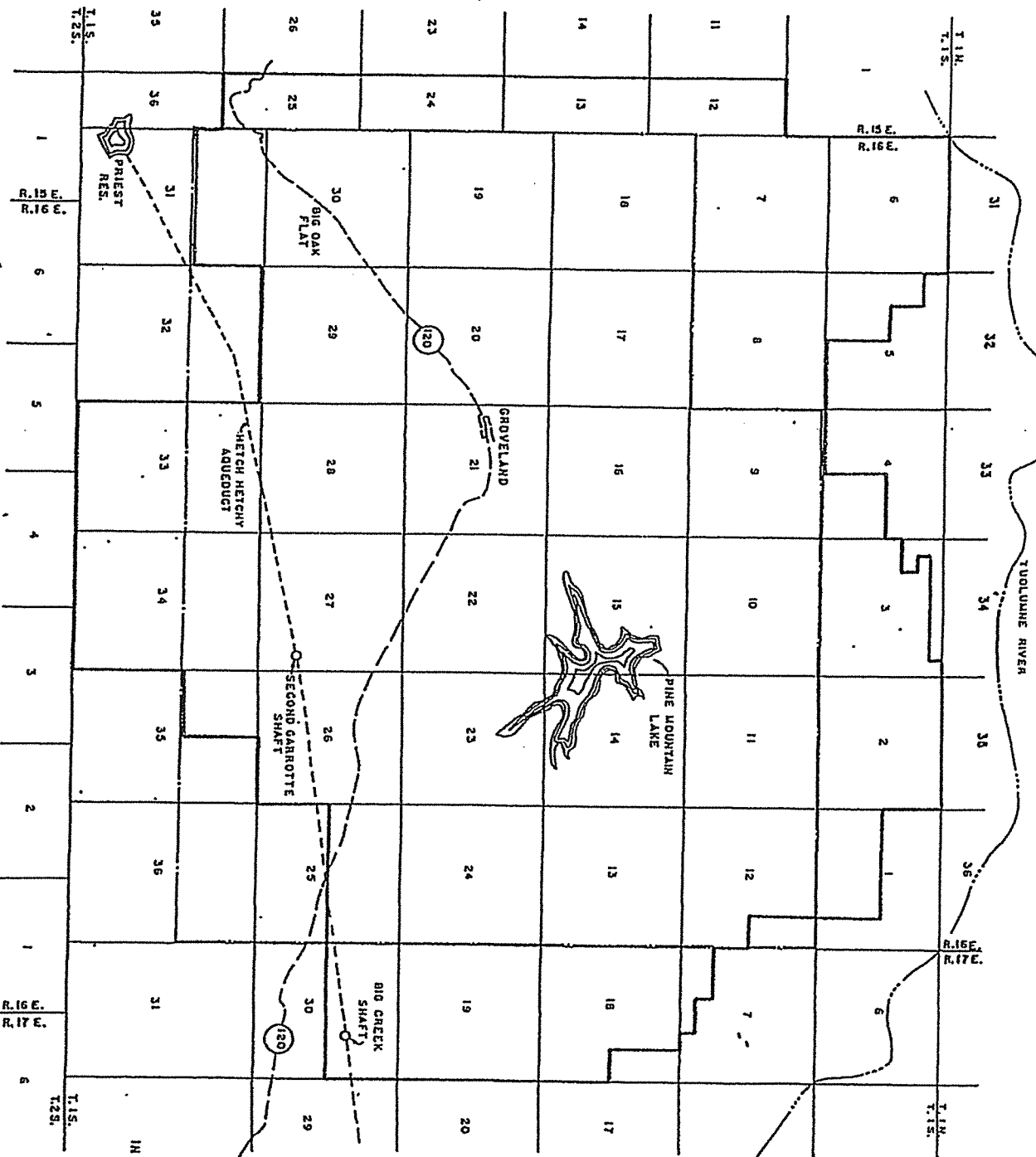
By   
M. M. Dow  
Utilities General Counsel

GROVELAND COMMUNITY SERVICES DISTRICT

By   
B. C. Beaudreau  
General Manager

Authorized by Resolution No. 4-84  
of the Board of Directors

Adopted: May 8, 1984

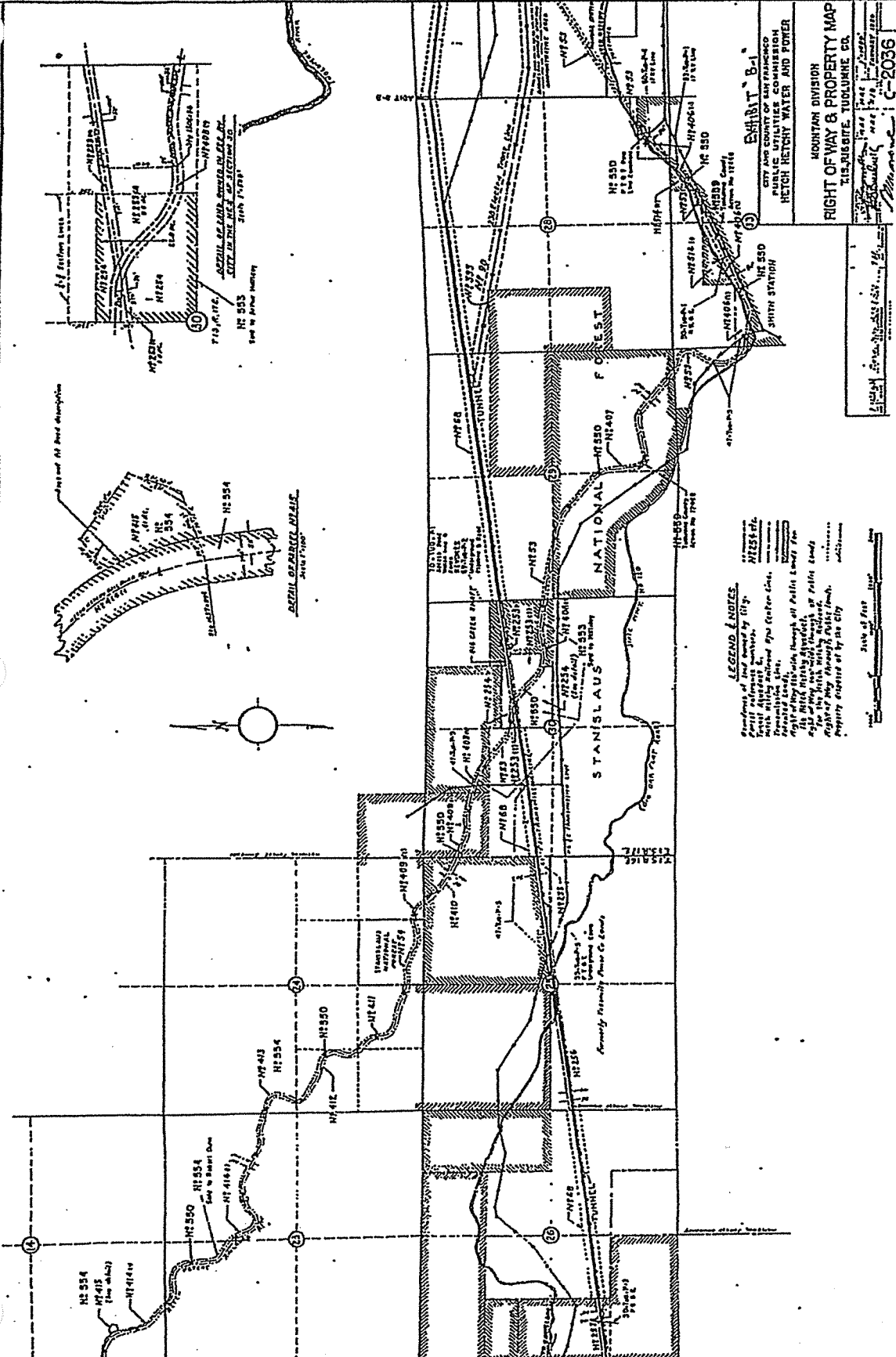
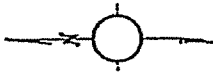
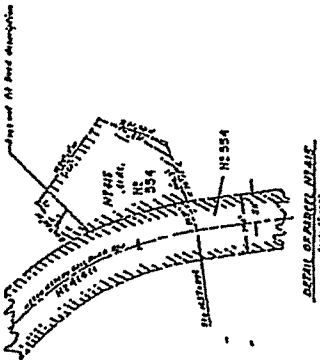
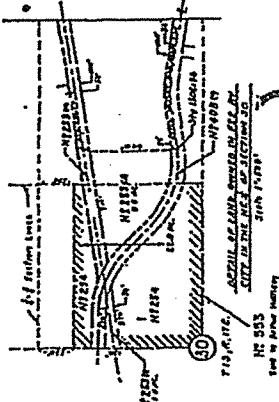


**LEGEND**  
 ——— NEW BOUNDARY  
 - - - - - OLD BOUNDARY

**EXHIBIT A**  
 IN ACCORDANCE WITH RESOLUTION 2-72 OF THE GROVE-  
 LAND COMMUNITY SERVICES DISTRICT

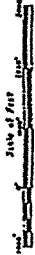
**PROPOSED S. F. CONTRACT BOUNDARY**

GROVELAND COMMUNITY SERVICES DISTRICT



**LEGEND & NOTES**

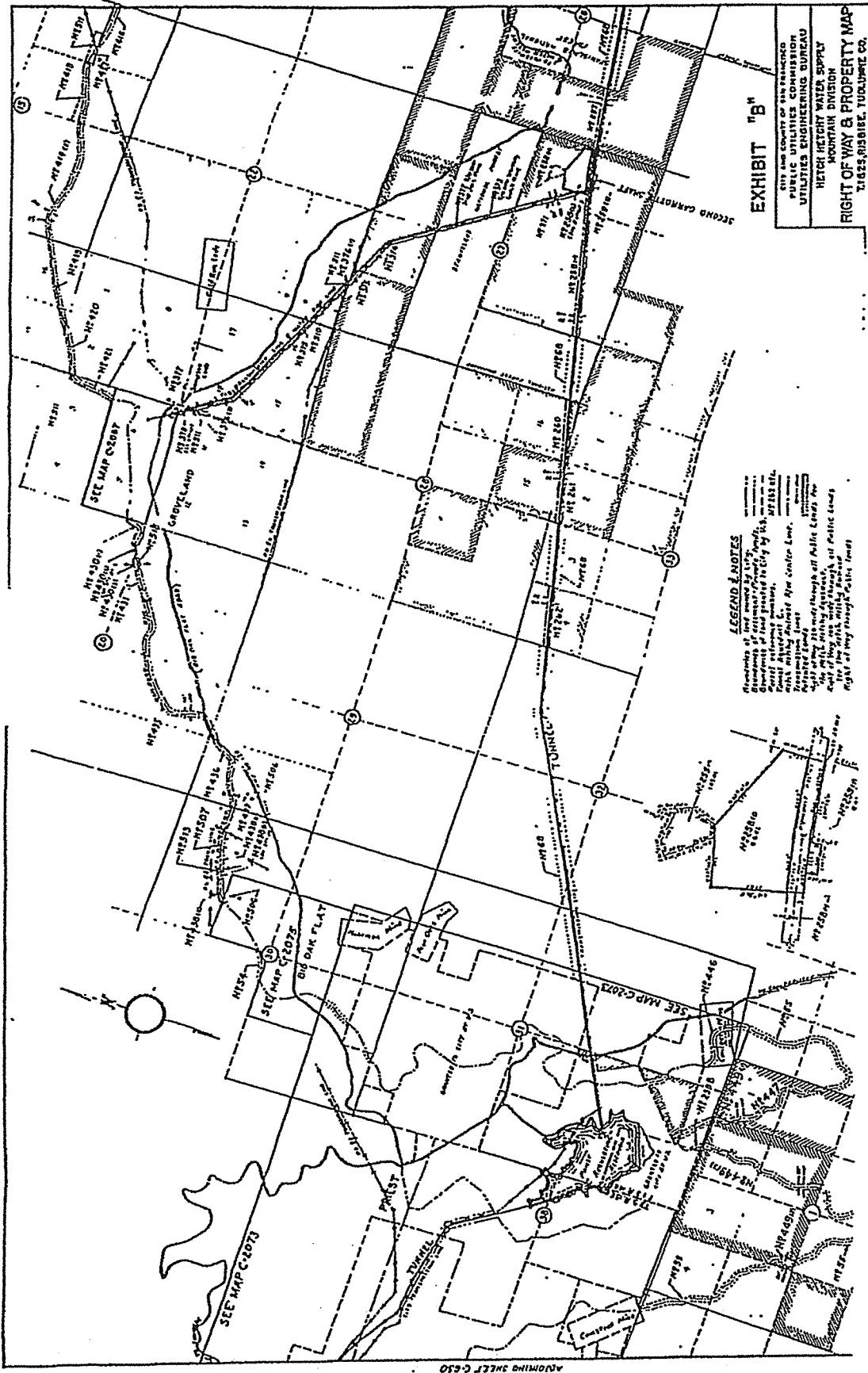
Boundaries of lots shown by 1/8" lines  
 Easements shown by 1/4" lines  
 Right of Way shown by 1/2" lines  
 Public Utilities Commission  
 Transmission Line  
 Power Line  
 Gas Line  
 Telephone Line  
 Sewer Line  
 Water Line  
 Storm Drain  
 Right of Way shown by 1/2" lines  
 Property shown as of the City



**EXHIBIT B-1**

MOUNTAIN DIVISION  
 CITY AND COUNTY OF SAN FRANCISCO  
 PUBLIC UTILITIES COMMISSION  
 HETCH HETCHY WATER AND POWER

**RIGHT OF WAY & PROPERTY MAP**  
 T15, R15, S15, T16, R16, S16, T17, R17, S17



**LEGEND NOTES**

Boundaries of land owned by City of Berkeley  
 Boundaries of land owned by State of California  
 Boundaries of land owned by County of Alameda  
 Boundaries of land owned by County of Contra Costa  
 Boundaries of land owned by County of San Francisco  
 Boundaries of land owned by County of San Mateo  
 Boundaries of land owned by County of Santa Clara  
 Boundaries of land owned by County of Santa Cruz  
 Boundaries of land owned by County of Stanislaus  
 Boundaries of land owned by County of Sutter  
 Boundaries of land owned by County of Yuba

**EXHIBIT "B"**

CITY AND COUNTY OF SAN FRANCISCO  
 PUBLIC UTILITIES COMMISSION  
 UTILITIES ENGINEERING DIVISION  
 WATER DEPARTMENT  
 WATER METER WATER SUPPLY  
 MOUNTAIN DIVISION  
 RIGHT OF WAY & PROPERTY MAP  
 T1625, R1531B, TUCKER CO.

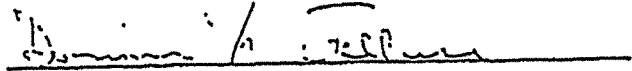
GROVELAND COMMUNITY SERVICES DISTRICT  
POPULATION & WATER USE PROJECTIONS

Year	(1)	(2) Groveland		(3)	(4)	(5)	(6)	(7)
	County Population	Permanent	Seasonal	25% of Season	Total Consumers	MCD	AF/Year	
1980	33,921	1498	1600	400	1,898	.192	215	
1990	49,700	3700	3700	925	4,695	.925	700	
2000	60,000	6900	6624	1656	8,556	1.711	1,916	
2020	89,200	13305	11974	2994	16,299	3.260	3,651	
2050	120,200	18375	15158	3790	22,072	4.414	4,944	
2070	135,500	21600	17280	4320	25,920	5.184	5,806	

Notes

- (1) Based on 1980 Census and 1980 County General Plan Projections (utilized Board of Finance estimates)
- (2) Based on 1980 Census and 1980 County General Plan Study of growth areas.
- (3) Estimates prepared for study of seasonal home construction and 1980 Census reports.
- (4) Estimated water use based on related Environmental Impact Reports for proposed projects.
- (5) Total of Columns (2) and (4).
- (6) Based on 200 gallons per capita.
- (7) Conversion of Column (6) to Acre-feet per year.

Prepared by County Administrative Office



DOMINIC SALLUCE, Sr. Management Analyst

Approved by Groveland Community Services District


  
BAYARD C. BEAUDREAU, General Manager

Exhibit C

Exhibit D

The service charge and the charge for water delivered shall be adjusted by application of an index determined on the basis of the annual changes in Hetch Hetchy's operating and maintenance costs. Such adjustment shall be implemented beginning July 1, 1987 and every four years thereafter for the term of the contract. The index shall be derived as follows:

$$\text{Index} = A/B$$

Where A = Estimated Hetch Hetchy operating and maintenance costs for the year in question

B = Estimated Hetch Hetchy operating and maintenance costs for the base year -  
FY 1983-84

The estimated values of A and B shall be determined by the application of the linear least-squares regression analysis upon actual data of record for five previous years. The index thus derived is then applied to the Service Charge and the Charge for Water Delivered as indicated in Paragraphs 11.1(a) and 11.1(b).

For example, the index to be applied effective July 1, 1987 is determined as follows (see attached data sheets 840330TLC-1 and -2):

$$A = 11,329.68 \quad B = 9,118.60$$

$$\text{Index} = A/B = 11,329.68/9,118.60 = 1.24$$

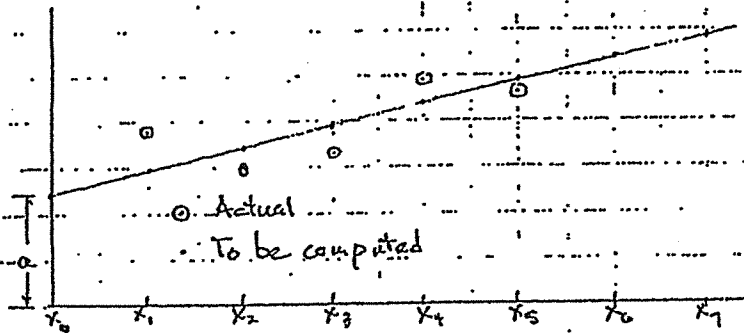
$$\text{Therefore Service Charge} = \$75.00 \times 1.24 = \$93.00$$

$$\text{Charge for Water Delivered} = 7.12\text{¢/ccf} \times 1.24 = 8.83\text{¢/ccf}$$

DATA SHEET

UTILITIES ENGINEERING BUREAU

SUBJECT Linear Least-Square Regression Analysis - Estimating  $Y_7$  for Year  $X_7$   
Based on Actual Values of  $Y$  for Five Prior Years of Record,  $Y_1$  thru  $Y_5$   
 BY TLC CHECKED BY \_\_\_\_\_ DATE 10/17 1983 SHEET OF



$$b = \frac{\sum x_i y_i - 3 \sum y_i}{10}$$

$$a = \frac{\sum y_i}{5} - 3b$$

$$y_7 = a + 7b$$

(1)	(2)	(3)	(4)	(5)	(6)
Fiscal Year	$x_i$	Total Operating Expense (000)	Total Maintenance Expense (000)	$y_i$ (3) + (4)	$x_i y_i$ (2) x (5)
1978	1			5,636	5,636
1979	2			6,045	12,090
1980	3			5,425	16,275
1981	4			6,887	27,548
1982	5			8,492	42,460
$\Sigma$	15			32,485	104,009
				(A)	(B)

\* Subject to Verification

$$b = \frac{\sum x_i y_i - 3 \sum y_i}{10} = \frac{(B) - 3(A)}{10} = \frac{(104,009) - 3(32,485)}{10} = 655.40 \quad (C)$$

$$\bar{y} = \frac{\sum y_i}{5} = \frac{(A)}{5} = \frac{(32,485)}{5} = 6,497.00 \quad (D)$$

$$\bar{x} = \frac{\sum x_i}{5} = \frac{15}{5} = 3$$

$$a = \bar{y} - b\bar{x} = (D) - 3(C) = (6,497.00) - 3(655.40) = 4,530.80 \quad (E)$$

$$\therefore \text{For year } x_i = x_7, y_7 = (E) + 7(C) = (4,530.80) + 7(655.40) = 9,118.60 \quad (F)$$

For year  $x_i = x_1$ , Index referred to  $x_i = \text{base}$

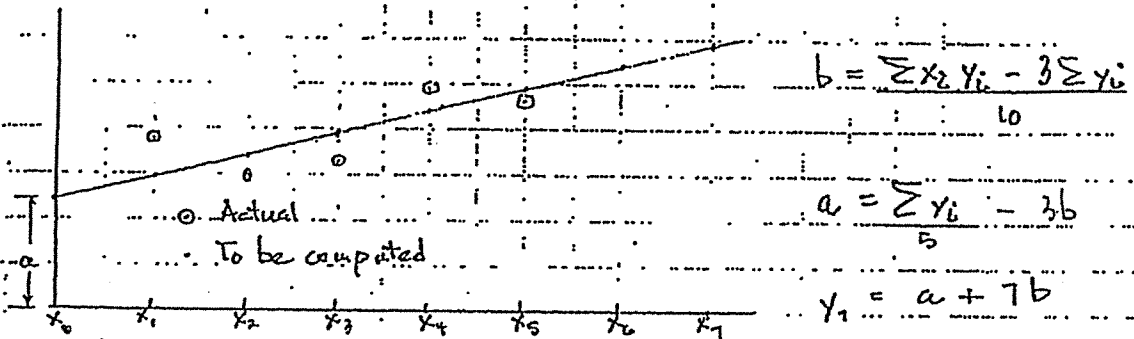
$$\text{is } \frac{y_7}{y_{\text{base}}} = \frac{(F)_7}{(E)_{\text{base}}} = \frac{(9,118.60)}{(4,530.80)}$$

Notes: 1. Source of actual data for Cols. 3 and 4 - Hetch Hetchy's annual income statements for fiscal years ending June 30.

2. All computations to be computed to 2 places after the decimal.

UTILITIES ENGINEERING BUREAU

SUBJECT: Linear Least-Square Regression Analysis - Estimating  $Y_7$  for Year  $X_7$   
Based on Actual Values of  $Y$  for Five Prior Years of Record,  $Y_1$  thru  $Y_5$   
 BY: TLC CHECKED BY: \_\_\_\_\_ DATE: 10/17 1983 SHEET: 01



(1)	(2)	(3)	(4)	(5)	(6)
Fiscal Year	$x_i$	Total Operating Expense (000)	Total Maintenance Expense (000)	$y_i$ (3) + (4)	$x_i y_i$ (2) x (5)
1982	1			8,492.00	8,492.00
1983	2			6,463.70	16,926.40
1984	3			9,118.60	27,355.80
1985	4			9,774.00	39,096.00
1986	5			10,429.40	52,147.00
$\Sigma$	15			46,277.20 (A)	144,017.20 (B)

$$b = \frac{\sum x_i y_i - 3 \sum y_i}{10} = \frac{(B) - 3(A)}{10} = \frac{(144,017.20) - 3(46,277.20)}{10} = 518.56 \quad (C)$$

$$\bar{y} = \frac{\sum y_i}{5} = \frac{(A)}{5} = \frac{(46,277.20)}{5} = 9,255.44 \quad (D)$$

$$\bar{x} = \frac{\sum x_i}{5} = \frac{15}{5} = 3$$

$$a = \bar{y} - b\bar{x} = (D) - 3(C) = (9,255.44) - 3(518.56) = 7,699.76 \quad (E)$$

$$\therefore \text{For year } x_i = x_7, y_7 = (E) + 7(C) = (7,699.76) + 7(518.56) = 11,329.68 \quad (F)$$

For year  $x_i = x_1$ , Index referred to  $x_i = \text{base}$

$$\text{is } \frac{y_7}{y_{\text{base}}} = \frac{(F)_7}{(F)_{\text{base}}} = \frac{(11,329.68)}{(9,118.60)} = 1.24 \quad \leftarrow \text{ANS}$$

- Notes: 1. Source of actual data for Cols. 3 and 4 - Hetch Hetchy's annual income statements for fiscal years ending June 30.  
 2. All computations to be computed to 2 places after the decimal.



Exhibit E

Surcharge for Power Loss shall be adjusted by application of an index determined on the basis of the annual changes in PGandE's system average costs as submitted to the Securities and Exchange Commission in Report Form 10-K. Such adjustment shall be implemented beginning July 1, 1987 and every four years thereafter for the term of the contract.

The index shall be derived as follows:

$$\text{Index} = A/B$$

Where A = Estimated PGandE system average costs  
for the year in question

B = Estimated PGandE system average costs  
for the base year - 1983

The estimated values of A and B shall be determined by the application of the linear least-squares regression analysis upon actual data of record for five previous years. The index thus derived is then applied to the Surcharge for Power Loss as indicated in Paragraph 11.1(c).

For example, the index to be applied effective July 1, 1987 is determined as follows (see attached data sheets 830818TLC-1 and -2):

$$A = 104.44$$

$$B = 73.58$$

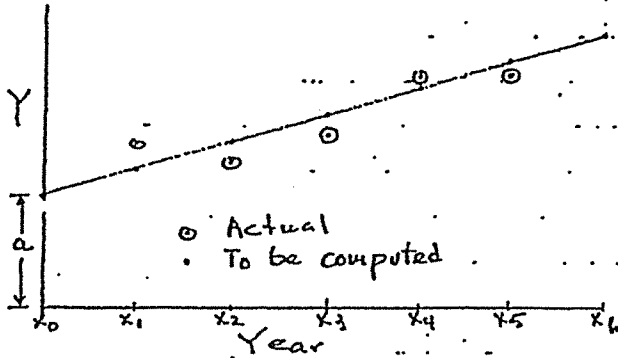
$$\text{Index} = A/B = 104.44/73.58 = 1.42$$

$$\text{Therefore Surcharge} = 9.81\text{¢/ccf} \times 1.42 = 13.93\text{¢/ccf}$$

UTILITIES ENGINEERING BUREAU

SUBJECT Linear Least-squares Regression Analysis - Estimating  $Y_6$  for Year  $X_6$  Based on Actual Values of  $Y$  for Preceding Five Years

BY TLC CHECKED BY \_\_\_\_\_ DATE 8/18 1983 SHEET 3 OF \_\_\_\_\_



$$b = \frac{\sum x_i y_i - 3 \sum y_i}{10}$$

$$a = \frac{\sum y_i}{5} - 3b$$

$$y_6 = a + 6b$$

(1)	(2)	(3)	(4)	(5)	(6)
Year	$x_i$	Total operating Revenue (\$ 000)	Total Energy Sales - (GWh)	$y_i$ (3) ÷ (4)	$x_i y_i$ (2) × (5)
1978	1	2,096,933	56,136	37.35	37.35
1979	2	2,463,845	59,728	41.25	82.50
1980	3	2,927,841	58,292	50.23	150.69
1981	4	3,905,873	61,669	63.34	253.36
1982	5	3,848,602	60,446	63.67	318.35
$\Sigma$	15			255.84 (A)	642.25 (B)

$$b = \frac{\sum x_i y_i - 3 \sum y_i}{10} = \frac{(B) - 3(A)}{10} = \frac{(642.25) - 3(255.84)}{10} = 7.47 \quad (C)$$

$$\bar{y} = \frac{\sum y_i}{5} = \frac{(A)}{5} = \frac{(255.84)}{5} = 51.17 \quad (D)$$

$$\bar{x} = \frac{\sum x_i}{5} = \frac{15}{5} = 3$$

$$a = \bar{y} - b\bar{x} = (D) - 3(C) = (51.17) - 3(7.47) = 28.76 \quad (E)$$

$$\therefore \text{For Year } X_6 = 6, y_6 = (E) + 6(C) = (28.76) + 6(7.47) = 73.58 \quad (F)$$

For Year  $X_6 = 6$ , Index referred to Year  $X_i = \text{base} =$

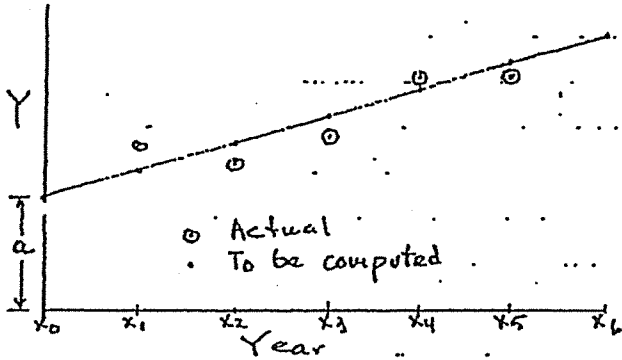
$$\frac{y_6}{y_{i=\text{base}}} = \frac{(F)_6}{(F)_{i=\text{base}}} = \frac{(\quad)}{(73.58)} = \quad \leftarrow 1983$$

- Notes:
- Source of actual data for Cols. 3 and 4 - PG and E's annual report SEC Form 10-K to the Securities & Exchange Commission
  - 1985 Index shall be used for determining rates effective July 1, 1985, etc.
  - All calculations to be computed to 2 places after the decimal

UTILITIES ENGINEERING BUREAU

SUBJECT Linear Least-squares Regression Analysis - Estimating  $y_6$  for Year  $x_6$  Based on Actual Values of  $y$  for Preceding Five Years

BY TLC CHECKED BY \_\_\_\_\_ DATE 8/18 1983 SHEET 3 OF \_\_\_\_\_



$$b = \frac{\sum x_i y_i - 3 \sum y_i}{10}$$

$$a = \frac{\sum y_i}{5} - 3b$$

$$y_6 = a + 6b$$

(1)	(2)	(3)	(4)	(5)	(6)
Year	$x_i$	Total operating Revenue (\$ 000)	Total Energy Sales - (GWh)	$y_i$ (3) ÷ (4)	$x_i y_i$ (2) × (5)
1982	1	3,848,602	60,446	63.67	63.67
1983	2			73.58	147.16
1984	3			81.05	243.15
1985	4			88.52	354.08
1986	5			95.99	479.95
$\Sigma$	15			402.81	1288.01
				(A)	(B)

Assumed  
"  
"  
"

$$b = \frac{\sum x_i y_i - 3 \sum y_i}{10} = \frac{(B) - 3(A)}{10} = \frac{(1288.01) - 3(402.81)}{10} = 7.96 \quad (C)$$

$$\bar{y} = \frac{\sum y_i}{5} = \frac{(A)}{5} = \frac{(402.81)}{5} = 80.56 \quad (D)$$

$$\bar{x} = \frac{\sum x_i}{5} = \frac{15}{5} = 3$$

$$a = \bar{y} - b\bar{x} = (D) - 3(C) = (80.56) - 3(7.96) = 56.68 \quad (E)$$

$$\therefore \text{For Year } x_6 = 6, y_6 = (E) + 6(C) = (56.68) + 6(7.96) = 104.44 \quad (F)$$

For Year  $x_6 = 6$ , Index referred to Year  $x_i = \text{base} =$

$$\frac{y_6}{y_{i=\text{base}}} = \frac{(F)_6}{(F)_{i=\text{base}}} = \frac{(104.44)}{(73.58)} = 1.42 \quad \leftarrow 1983$$

- Notes:
- Source of actual data for Cols. 3 and 4 - I.P.G. and E's annual report SEC Form 10-K to the Securities & Exchange Commission
  - 1985 Index shall be used for determining rates effective July 1, 1985, etc.
  - All calculations to be computed to 2 places after the decimal

RESOLUTION NO. 4-84

A RESOLUTION OF THE GROVELAND COMMUNITY SERVICES DISTRICT  
APPROVING A MODIFIED CONTRACT FOR WATER SERVICE BETWEEN  
GROVELAND COMMUNITY SERVICES DISTRICT AND THE CITY AND  
COUNTY OF SAN FRANCISCO.

WHEREAS, the City and County of San Francisco has prepared a contract to modify in its entirety the 1965 Contract For Water Service, as Amended, between City and District; and

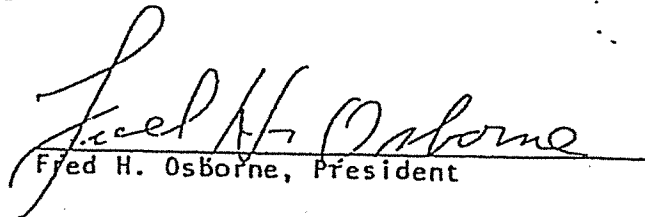
WHEREAS, elements of the modified contract for water service include an extension of the term from year 2020 to year 2034, the enlargement of the boundaries of the service area and a reduction in the rates charged for raw water pumped by District from the Hetch Hetchy Aqueduct; and

WHEREAS, it is in the best interest of the District to enter into the modified contract, effective January 1, 1984, as adopted by the Public Utilities Commission of the City and County of San Francisco on April 24, 1984;

NOW, THEREFORE BE IT RESOLVED BY the Board of Directors of the Groveland Community Services District that said Contract be and it hereby is approved and Bayard C. Beaudreau, General Manager of said District, is authorized and directed to execute said Contract on the part of the Groveland Community Services District.

PASSED AND ADOPTED at a regular meeting of said District on May 8, 1984 by the following vote:

AYES:	Directors	Ducharme, Macy, Fenton, McDowell & President Osborne
NOES:	Directors	None
ABSENT:	Directors	None
ABSTAINING:	Directors	None

  
Fred H. Osborne, President

TEST:

  
Sue A. Gianelli, Secretary

**PUBLIC UTILITIES COMMISSION**  
CITY AND COUNTY OF SAN FRANCISCO

**84-0186**

RESOLUTION No. \_\_\_\_\_

WHEREAS, The City and County of San Francisco (City) and the Groveland Community Services District (District) entered into an agreement for water service on March 23, 1965, amended by Amendment No. 1 on January 9, 1968 and Amendment No. 2 on May 18, 1971; and

WHEREAS, The water needs of the District are growing and the District desires a firm supply to meet its future water needs; and

WHEREAS, The District desires and the City consents to extend the term of the current contract to March 23, 2034; and

WHEREAS, City and District recognize that the rates and charges for furnishing such water service be made on a fair and equitable basis; now, therefore, be it

RESOLVED, That this Commission does hereby approve the terms and conditions of the agreement, dated January 1, 1984, between the City and District and authorizes the General Manager of Public Utilities to execute same on behalf of this Commission.

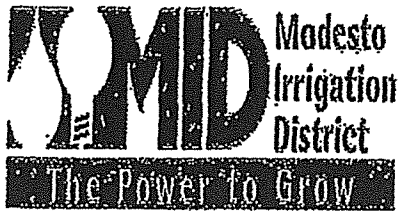
I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission  
at its meeting of \_\_\_\_\_

*Romaine A. Bolbridge*  
Secretary, Public Utilities Commission

**APPENDIX G**  
**WATER EXCHANGE AGREEMENT BETWEEN SAN FRANCISCO PUBLIC**  
**UTILITIES COMMISSION AND TURLOCK IRRIGATION DISTRICT**

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July 23, 2007

Michael P. Carlin  
Assistant General Manager – Water Enterprise  
San Francisco Public Utilities Commission  
1155 Market Street, Fourth Floor  
San Francisco, California 94103

Dear Michael:

It is our understanding that under the SFPUC's Hetch Hetchy Long-Term Maintenance Program, the Mountain Tunnel will periodically be taken out of service over the next ten years. Each outage is not expected to last for more than 60 days at a time and will be confined to the winter months when demand on your system is at its lowest point.

We also understand that the planned outages will have an adverse affect upon Groveland Community Services District, which obtains a supplemental drinking water supply from the SFPUC. In essence, whenever the Mountain Tunnel is down, GCSD will be without its supplemental drinking water supply. To address this predicament, GCSD proposes during these periods to use water in Pine Mountain Lake that would normally flow by water right of the Districts to the Don Pedro Reservoir. SFPUC proposes to assist GCSD by allowing adjustments to its Don Pedro water bank account to cover any shortfall in the amount of water that would otherwise flow from Pine Mountain Lake to Don Pedro Reservoir.

The Districts recognize the need for maintenance of the Hetch Hetchy system and the inconvenience that it will cause to GCSD. We also recognize that the amount of water involved is expected to be less than 200 acre-feet per outage. Consequently, based upon the preceding facts, we wish to cooperate to the extent that we can, by assisting the SFPUC and GCSD during the period when the Mountain Tunnel will be out of service. The Districts would agree to the use of water from Pine Mountain Lake by GCSD under the following conditions:

1. The GCSD shall obtain all necessary permits required for the use of the water.
2. That there shall be no adverse impacts to the Districts' water rights and that the Districts be kept whole at all times.
3. Water used by GCSD during maintenance outages shall be metered at the diversion point and that a similar amount be deducted from the Don Pedro water bank.
4. Meter readings shall be forwarded to the Districts by the 10<sup>th</sup> day of the month following any month in which water is diverted.

Michael P. Carlin  
Assistant General Manager – Water Enterprise  
San Francisco Public Utilities Commission  
July 23, 2007  
Page 2

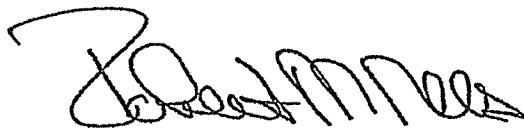
5. The agreement allowing GCSO to use water in Pine Mountain Lake and the corresponding adjustment to the Don Pedro water bank shall expire on March 1, 2017.
6. Authorization is for the purpose of this unique circumstance and shall not establish or set a precedent for future requests. Further, the Districts acknowledge that nothing herein is intended to establish a precedent or course of conduct between the Parties as to their respective Tuolumne River water rights or agreements, including Don Pedro water bank accounting.

If these conditions are satisfactory to you, please indicate your concurrence by signing and dating where indicated and return a copy to each of us.

Sincerely,



Walter P. Ward  
Assistant General Manager  
Water Operations  
Modesto Irrigation District  
P.O. Box 4060  
Modesto, California 95352



Robert M. Nees  
Assistant General Manager  
Water Resources & Regulatory Affairs  
Turlock Irrigation District  
P.O. Box 949  
Turlock, California 95380

I hereby agree to the terms and conditions expressed above.



30 July 07

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Michael P. Carlin, Assistant General Manager – Water Enterprise

Date



**APPENDIX H**  
**ENERGY INTENSITY TABLES**

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**Urban Water Supplier:**

Groveland Community Services District

**Water Delivery Product** (If delivering more than one type of product use Table O-1C)

Retail Potable Deliveries

**Table O-1B: Recommended Energy Reporting - Total Utility Approach**

Enter Start Date for Reporting Period	1/1/2020	Urban Water Supplier Operational Control		
End Date	12/30/2020			
<input type="checkbox"/> Is upstream embedded in the values reported?		Sum of All Water Management Processes	Non-Consequential Hydropower	
<i>Water Volume Units Used</i>	MG	Total Utility	Hydropower	Net Utility
<i>Volume of Water Entering Process (volume unit)</i>		129.54	0	129.541876
<i>Energy Consumed (kWh)</i>		940378	0	940378
<i>Energy Intensity (kWh/volume)</i>		7259.3	0.0	7259.3

**Quantity of Self-Generated Renewable Energy**

0 kWh

**Data Quality** (Estimate, Metered Data, Combination of Estimates and Metered Data)

Metered Data

**Data Quality Narrative:**

Data was provided by the Chief Operator for the GCS D's water system. The 129.54 MG is the amount of raw water that is metered leaving the Hetch Hetchy mountain tunnel and sent to the Water Treatment Plants (Second Garrote WTP, Big Creek WTP, and Alternative Water Supply (ASW) WTP). The 102.04 MG is the amount of treated water that was delivered to customers and used for flushing activities, both are metered. A total of 857,440 kWh was used for water treatment at the Second Garrote WTP, Big Creek WTP, and Alternative Water Supply (ASW) WTP. A total of 82,938 kWh was used to pump treated water from the WTPs to the five (5) storage reservoirs and from the reservoirs into the distribution system where water is delivered to customers.

**Narrative:**

In the water system, energy is consumed to pump water from the two vertical shafts that are tapped into the Mountain Tunnel (Big Creek Station and Second Garrote Station), treat the surface water at the Second Garrote WTP, Big Creek WTP, and Alternative Water Supply (ASW) WTP, pump water into the five storage reservoirs, and deliver water to customers. The GCS D does not produce any form of renewable energy and all energy consumed is produced by PG&E.

**Urban Water Supplier:**

Groveland Community Services District

Table O-2: Recommended Energy Reporting - Wastewater & Recycled Water					
Enter Start Date for Reporting Period		1/1/2020		Urban Water Supplier Operational Control	
End Date		12/30/2020			
Water Management Process					
<input type="checkbox"/> Is upstream embedded in the values reported?		Collection / Conveyance	Treatment	Discharge / Distribution	Total
Volume of Water Units Used		MG			
Volume of Wastewater Entering Process (volume units selected above)		0	41.992662	0	41.992662
Wastewater Energy Consumed (kWh)		211824	584640	0	796464
Wastewater Energy Intensity (kWh/volume)		0.0	13922.4	0.0	18966.7
Volume of Recycled Water Entering Process (volume units selected above)		0	0	0	0
Recycled Water Energy Consumed (kWh)		0	0	0	0
Recycled Water Energy Intensity (kWh/volume)		0.0	0.0	0.0	0.0

**Quantity of Self-Generated Renewable Energy related to recycled water and wastewater operations**

0 kWh

Data Quality (Estimate, Metered Data, Combination of Estimates and Metered Data)

Metered Data

**Data Quality Narrative:**

Data is provided by the GCSD from wastewater flow meters and electric meters. Energy consumption in the "Treatment" process includes discharge/distribution (e.g., effluent pumps) to the spray fields and PML golfcourse.

**Narrative:**

Wastewater management processes consuming energy include lift stations, pumps, treatment, and discharge. The total wastewater volume is listed under the "Treatment" process. Recycled water energy consumption is not readily available.

**APPENDIX I**  
**WATER ORDINANCE NO. 2-17**

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# **WATER ORDINANCE 2-17**

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**ARTICLE I.**  
**General Provisions**

Section 1.1. Short title.

This chapter shall be known and may be cited as “Groveland Community Services District Water Ordinance.”

Section 1.2. Words and phrases.

For the purpose of this ordinance, all words used in this chapter in the present tense shall include the future; all words in the plural number shall include the singular number; and all words in the singular number shall include the plural number.

Section 1.3. Water system.

The GCSD will furnish a system, plant, works and undertaking used for and useful in obtaining, conserving and distributing water for public and private uses, including all parts of said system, all appurtenances to it, and lands, easements, rights in land, water rights, contract rights, franchises, and other water supply, storage and distribution facilities and equipment.

Section 1.4. Pressure conditions.

All applicants for service connections or water service, by accepting such service, are deemed, and consent, to accept such conditions of pressure and service as are provided by the distribution system at the location of the proposed service connection, and to hold the GCSD harmless from any damages arising out of low pressure or high pressure conditions or interruptions in service.

Section 1.5. Tampering with GCSD property.

No one except an employee or representative of the GCSD shall at any time in any manner operate, interfere with, or tamper with District property and the Public Water System including, but not limited to, the curbstops or valves, main stops, gates or valves, or street mains.

Section 1.6. Ruling final.

All rulings of the General Manager shall be final unless, where appeal to the Board of Directors is allowed, appealed in writing to the Board of Directors within five days of the date of mailing of the General Manager’s ruling. When appealed, all rulings of the Board shall be final.

Section 1.7. Interruption in Service.

GCSD shall not be liable for damage that may result from an interruption in service from a cause beyond the control of the GCSD.

Section 1.8. Ground Wire Attachment.

Ground wire connections to any plumbing which ultimately is connected to the GCSD Water System is prohibited unless approved in writing by the General Manager.

Section 1.9. Unpermitted Connections.

Any person connecting to the District Water System without written authorization from the District shall be liable for all damages caused to the Public Water System including, but not limited to, sanitizing the Public Water System, payment of any water the General Manager estimates was taken through the connection at existing rates, and all other fines and penalties applicable.

Section 1.10. Ingress and egress.

Representatives from the District shall have the right of ingress and egress to the customer's premises at reasonable hours for any purpose reasonably connected with the furnishing of water service.

Section 1.11. Inspection fee.

Any person desiring to connect with the mains of the GCSD shall pay in addition to any other charges set out in this chapter, all applicable inspection fees established by resolution approved by the Board.

Section 1.12. Evaporative coolers.

No water coolers shall be installed or operated in any premises served water by the GCSD unless such water coolers are equipped with a recirculating pump.

Section 1.13. Pools and tanks.

When an abnormally large quantity of water is desired such as for filling a swimming pool or for other purposes, the Owner shall obtain written approval from the General Manager prior to taking such water. Approval to use water in unusual quantities will be given only if the General Manager determines that it can be safely delivered through the District's public water system without negatively effecting service to other consumers. Absent unique circumstances, the General Manager shall deny all requests under this section in periods of declared drought.

Section 1.14. Responsibility for equipment.

The customer shall, at his own risk and expense, furnish, install and keep in good and safe condition all equipment that may be required for receiving, controlling, applying and utilizing water, including but limited to, pressure regulating devices and hot water heaters. The GCSD shall not be responsible for any loss or damage caused by the improper installation of such equipment, or the negligence or wrongful act of the customer or of any of his tenants, agents, employees, contractors, licensees or permittees in installing, maintaining, or operating or interfering with such equipment. The GCSD shall not be responsible for damage to property caused by faucets, valves, and other equipment that are open when water is turned on either originally or when turned on after a temporary shutdown.

Section 1.15. Installation of wells.

It shall be unlawful to install wells in the GCSD for any purpose whatsoever without first securing the written permission of the GCSD Board.

Section 1.16. Time limits on connections.

Absent an agreement approved by the Board of Directors, whenever a water connection application has been issued upon the payment of the connection charges established by this ordinance, such application shall be valid for only 365 days after the date of issuance thereof unless actual construction of the building or structure for which water service has been applied has been commenced within said period of 365 days; provided, however, that said time limit may be extended by the GCSD Board of Directors for reasonable cause and subject to conditions as the Board may impose.

## **ARTICLE II. Definitions**

### Section 2.1. Definitions.

Certain words and phrases are defined in this action to clarify their use in this chapter. When a clarification is not given, or where a question of interpretation arises, the definition that shall continue is the normal meaning of the word within the context of its use.

2.1.1. Applicant. “Applicant” means the Owner of the Property or their agent as designated in writing.

2.1.2. Board. “Board” means the Board of Directors of the Groveland Community Services District.

2.1.3. Capacity Charge. “Capacity Charge” means a one-time charge paid when a new connection is made to the District Water System as defined in Government Code Section 66013(a)(3) established by resolution of the Board of Directors.

2.1.4. Connection Fee. “Connection Fee” means a one-time charge for the physical connection to the District Water System as defined in Government Code Section 66013(a)(5) established by resolution of the Board of Directors.

2.1.5. Cost. “Cost” means the cost of labor, material, transportation, supervision, engineering and all other necessary overhead expenses.

2.1.6. Cross-Connection. “Cross-connection” means any physical connection between the piping system from the GCSD service and that of any other water supply that is not, or cannot be, approved as safe and potable for human consumption, whereby water from the unapproved source may be forced or drawn into the GCSD distribution mains.

2.1.7. Customer. “Customer” means the Owner or registered tenant of Property receiving Service.

2.1.8. Distribution Mains. “Distribution mains” mean water lines in streets, highways, alleys, and easements used for public and private fire protection and for general distribution of water.

2.1.9. Equivalent Meter Unit and EMU. “Equivalent Meter Unit” and “EMU” means the ratio of a nominal capacity water meter (peak or non-peak use, depending on application) of that water meter divided by the nominal capacity of a 5/8-inch water meter.

2.1.10. GCSD or District. “GCSD” or the “District” means Groveland Community Services District.

2.1.11. Ordinance. “Ordinance” means the Groveland Community Services District Water Ordinance.

2.1.12. Owner. “Owner” means the person owning the title to the property, or the person in whose name the legal title to the property appears, by deed duly recorded in the county recorder’s office, or the person in possession of the property or buildings under claim of, or exercising acts of ownership over same for himself, or as executor, administrator, guardian or trustee of the owner.

2.1.13. Person. “Person” means any individual, firm, company, partnership, association and private or public or municipal corporations, the United States of America, the state of California, districts and all political subdivisions and governmental agencies.

2.1.14. Premises. “Premises” means a lot or parcel of real property under one ownership, except that each dwelling unit, whether or not separate and any other separate structure under one roof, shall be deemed separate premises. However, motels, office buildings, and structures of like nature may be classified by resolution of the GCSD Board as a single premise.

2.1.15. Private Fire Protection Service. “Private fire protection service” means water service and facilities for building sprinkler system, hydrants, hose reels and other facilities installed on private property for fire protection and the water available therefor.

2.1.16. Property. “Property” means a legal parcel of real property.

2.1.17. Public Fire Protection Service. “Public fire protection service” means the service and facilities of the entire water supply, storage and distribution system of the GCSD, including the fire hydrants affixed thereto, and the water available for fire protection, excepting house service connections and appurtenances thereto.

2.1.18. Regular Water Service. “Regular Water Service” means water service and facilities rendered for normal domestic, commercial and industrial purposes on a permanent basis, and the water available therefor.

2.1.19. Service or Service Connection. “Service” or “Service Connection” means the pipeline and appurtenant facilities such as the curb stop, meter and meter box, if any, all used to extend water service from a distribution main to premises. Where services are divided at the curb or property line to serve several customers, each such branch service shall be deemed a separate service.

2.1.20. Standby Service. “Standby service” means a connection to a GCSD water line that is not normally used on a regular basis.

2.1.21. Temporary Water Service. “Temporary Water Service” means water service and facilities rendered for construction work and other uses of limited duration, and the water available therefor.

2.1.22. Tenant. “Tenant” – any customer who does not have legal title to the premises occupied, that is, renter, lessee, agent, concessionaire, etc. and occupies the premises with the permission of the property owner.

2.1.23. Water System and District Water System. “Public Water System” and “District Water System” means the water system owned and operated by the District including, but not limited to, all pump stations and water mains.



**ARTICLE III.**  
**Notices**

Section 3.1. Ordinance Applies to All.

The purpose of this Ordinance is to safeguard health, property, and public welfare by regulating and controlling the design, construction and quality of materials used in the public water systems. Except as otherwise herein stated, all of the provisions of this Ordinance shall apply to all buildings and structures heretofore erected or to be erected, and all connections heretofore made to the public water system in the District.

Section 3.2. Notices to customers.

Unless otherwise set forth in this Ordinance, all required notices from the GCSD to a Customer shall be given in writing, and either delivered to the Property receiving service or mailed to the address where bills are sent. Where conditions warrant and in emergencies as determined by the General Manager, the GCSD may provide notice either via telephone or e-mail.

Section 3.3. Notices from customers.

Notice from a customer to the GCSD shall be in writing and given by either hand delivery to the District's main office or mail addressed to the attention of either (1) the General Manager or designee or (2) an officer or agent duly authorized by the Board of Directors to receive notices.

**ARTICLE IV.**  
**Application for Regular Water Service Where No Main Extension Required**

Section 4.1. Application for water service.

Any Person desiring Regular Water Service, where no main extension is required, shall submit an application to the District using the form provided by the GCSD. The application shall be signed by the Owner and accompanied by a copy of the property's Recorded Deed and Plot Map when submitted to the District. Application forms may be changed from time to time by the General Manager. Applicant must provide water demand and fire flow calculations performed by a licensed engineer.

Section 4.2. Undertaking of Applicant.

The submission of an application shall constitute the Applicant's agreement to comply with this Ordinance and other ordinances or regulations relating to the Regular Water Service, including, but not limited to, the timely payment of Services billed.

Section 4.3. Payment for previous service.

An application will not be considered if there is outstanding amounts the Applicant owes the District for any water Service previously rendered to the Applicant by the GCSD.

Section 4.4. Installation of services.

Regular Water Service shall be installed within the public utility easement at the location desired by the District, and of the size approved by the General Manager. Service installation for new subdivisions shall be subject to a written service agreement approved by the Board of Directors. All Service connections shall be installed by the GCSD, or a licensed contractor approved by GCSD, at the expense of the Applicant which shall be deposited with GCSD before the installation.

Section 4.5. Changes in Customer's use or equipment.

Customers making any material change in the size, character or extent of the equipment utilizing water Service, or whose change in use results in an increase in the use of water in excess of the approved application, shall immediately provide the GCSD written notice stating the nature of the change or use and, if necessary as determined by the General Manager, submit application to amend their existing approved application prior to the change in equipment or increase in water use.

Section 4.6. Connection charges.

Applicant shall pay in full all Connection Fees and Capacity Charges prior to approval of the application, the amount of which shall be fixed, from time to time, by resolution of the GCSD Board for each dwelling unit or other building, structure, or separate occupancy to be provided water service, whether or not separate connections for such units are required. Refer to Table A.

**ARTICLE V.**  
**Application for Regular Water Service When Main Extension Required**

Section 5.1. Main extensions.

The following rules are established for connections requiring an extension of a water main:

5.1.1. Application. Any Owner of one or more lots or parcels or subdivided tract of land desiring to connect to the Public Water System where, in the opinion of the General Manager, one or more main extensions are required to serve said Property, shall submit a written application to the GCSD on a form provided by the District containing the legal description of the premises to be served and tract number therefore, be accompanied by a map showing the location of the proposed connection, and provide any additional information which may be required by the General Manager.

5.1.2. Determination. Upon receipt of any application under Section 5.1.1, the General Manager shall determine whether in his/her judgment a main extension will be required before GCSD will provide service. Applicant must provide water demand and fire flow calculations performed by a licensed engineer.

5.1.3. Board Approval of Main Extension Application. Upon receipt of the application, the General Manager shall review the application of the proposed extension and submit his opinion and the estimated cost thereof to the Board for approval.

5.1.4. Ruling on Main Extension Application. The Board shall consider the main extension application and the opinion of the General Manager before ruling on the application. The Board may, in its sole discretion, reject the application or authorize the General Manager to negotiate a written service agreement for Board approval detailing the conditions of the approved main extension. The Board's ruling shall be final.

5.1.5. Main Extension Agreement. If a main extension is required and approved by the Board, the Owner of the Property and the District shall enter into a Will Serve Agreement approved by Board of Directors, that shall, among other things, set forth the manner and location of installation of the main extension, including compliance with the GCSD Operational Policies and Procedures Manual as it exists at the time the agreement is entered into. GCSD shall condition approval of a main extension installation and agreement upon dedication of the main extension and easement rights to GCSD.

5.1.6. Dedication of Main Extensions to GCSD. All main extensions approved in accordance with this Ordinance shall be dedicated to GCSD, together with easements as determined necessary by the General Manager, by the Owner prior to the right to use the main extension. GCSD will determine on a case by case basis accepting main line extensions.

5.1.7. Dead-End Lines. No dead-end main extension lines shall be permitted, except as recommended by the General Manager and approved by the Board which shall require the

Applicant to install an automatic flushing device. In cases where, subsequent to the approval of a dead-end line by the Board, another dead-end line is planned in sufficient proximity to make connection feasible, and such connection is recommended by the General Manager and approved by the Board, the dead-end lines shall be connected, the cost of which shall be borne by the subsequent dead-end line Applicant.

5.1.8. Extent and Design. All main extensions may, at the discretion of the General Manager, may extend to the far property line of developed property. If additional Property is developed on the same lot after installation of a main extension, the main extension may be extended to the far Property line of the additionally developed Property. All main extensions shall be subject to design approval by the General Manager and the Board.

Section 5.2. Installation of Extension Main.

All main extensions and Service connections shall be installed by the Applicant at their expense with installation made in compliance with GCSD standards and design, including inspection of all extensions by GCSD.

Section 5.3. Connection Charges.

Where a main extension is required, including new subdivisions, the Applicant shall deposit the applicable Connection Fee and Capacity Charge for each Service Connection with the GCSD prior to the connecting the main extension to the existing GCSD main.

Section 5.4. Reimbursement Agreement

If the Developer or Owner is extending water or sewer line past vacant property that may be developed in the future, the Owner or Developer may request that the District exercise its discretion to enter into a Reimbursement Agreement between Owner/Developer and the District. In the event the District elects to enter into a Reimbursement Agreement, the District shall use its standard Reimbursement Agreement that allows collection of connection fees and refunding of pro-rata share of installation expenses to the Owner/Developer under the terms set forth in the Reimbursement Agreement.

## **ARTICLE VI. Connection Requirements**

### **Section 6.1. Installations.**

All Service shall be metered. The Service Connection, whether located on public or private property, from and including the meter to the water main is the property of the District and part of the District Water System. The District shall have the right to access the Service for inspection, repair, replacement and maintenance, including, but not limited to, removing Service upon discontinuance of service.

### **Section 6.2. Service Connections.**

The Service shall be installed from the water main to the property line of the Property within the public utility easement. The service between the water meter and the building served by the Service shall be the private property of the customer and shall be maintained by the customer at their expense.

### **Section 6.3. Meter Installations.**

Only authorized employees or agents of the District, or licensed contractors approved by the General Manager will be permitted to install a Service Connection from the District's main to and including the water meter. Water meters will be installed within the public utility easement and are the property of the District and part of the District Water System. The District Water System shall not be subject to any charges of any kind by the Property Owner.

### **Section 6.4. Size and Location.**

The size of Service Connections, meters, and their location shall be subject to approval by the General Manager. The installation, including the meter, shall be the property of the District. The Property Owner shall be responsible for complying with all applicable District requirements and County building codes for plumbing installed downstream of the water meter.

### **Section 6.5. Angle Meter Stop (Curb Stop).**

Every service connection installed by the District shall be equipped with an angle meter stop. The stop is to be located on the District's side of the water meter. If the stop is damaged by the Customer's use, replacement shall be at the customer's expense. The customer shall install and maintain an isolation or shut-off valve within one foot of the water meter on the customer's side of the service installation.

### **Section 6.6. Meter Tests.**

A Customer may request that their meter be tested by the District for a fee of \$25.00 if they feel it reading inaccurately. Fee will be refunded if meter is found to be reading inaccurately. If the meter test determines the meter is reading inaccurately, the usage will be adjusted and billed under the following conditions:

6.6.1. Adjustment for Meter Errors – Fast Meters. If a meter, tested at the request of a customer pursuant to Section 6.6, is found to be more than two percent (2%) fast, the excess charges for the time service was rendered to the customer requesting the test or for a period of

six months, whichever is less, shall be credited to the customer's account and the meter or meter register will be changed by the District.

6.6.2. Adjustment for Meter Errors – Slow Meters. If a meter, tested at the request of a customer pursuant to Section 8.6, is found to more than 5% slow (i.e., registered less than 95% of actual flow) the District may bill the customer for the amount of the undercharge based upon corrected meter readings for the time service was rendered to the customer but not exceeding a period of six months and the meter or meter register will be changed by the District.

6.6.3. Non-Registering Meters. If a meter is found not registering, then the charges for service shall be based on the estimated consumption. Such estimates shall be made from previous consumption for a comparable period or by such other method as is determined by District.

**ARTICLE VII.**  
**General Use Regulations**

Section 7.1. Water use limitations.

GCS D water shall be limited in use to domestic, commercial, or industrial use including normal yard upkeep only. Commercial agricultural watering is prohibited. (Examples: vineyards, alfalfa fields, orchards, etc.)

Section 7.2. Number of services per premises.

The Applicant may apply for as many Services as may be reasonably required for their premises; provided, that the pipe line system for each service be independent of the others and that they not be interconnected; and provided further, that larger service lines may be required by the GCS D at their discretion for purposes of insuring adequate service pressures. The cost of all services shall be borne by the applicant. There will be a separate connection charge for each service.

Section 7.3. Supply to Separate Structures.

Each house, habitable structure, dwelling unit, or dwelling unit within a community housing project, for which application for water service is made, shall have a separate service connection, including a separate meter. A habitable structure is defined as 1) any structure where human occupancy is permitted by Tuolumne County and 2) any structure with living, kitchen, or any bathroom facilities. A detached garage or hangar with only a utility sink and/or bathroom is not considered habitable.

Section 7.4. Interruptions in service.

The GCS D shall not be liable for damage which may result from an interruption in service from a cause beyond the control of the GCS D. Temporary shutdowns may be made by the GCS D to make improvements and repairs. Whenever possible and as time permits, all customers affected will be notified prior to making such shutdowns. The GCS D will not be liable for interruption, shortage or insufficiency of supply, or for any loss or damage occasioned thereby, if caused by accident, act of God, fire, strikes, riots, war or any other cause not within its control.

Section 7.5. Responsibility for equipment on customer's premises.

All facilities installed by the GCS D on private property for the purpose of rendering water service shall remain the property of the GCS D and may be maintained, repaired or replaced by the GCS D without consent or interference of the owner or occupant of the property. The property owner shall use reasonable care in the protection of the facilities. No payment shall be made for placing or maintaining said facilities on private property. No persons shall place or permit the placement of any object in a manner which will interfere with the free access to a meter box or will interfere with the reading of a meter where installed. If a Customer violates this section, the District shall issue a written warning to the Customer directing them to correct the violation. Upon a second violation of this section occurring within Twelve (12) months of the first violation, the District shall impose a Fifty dollar (\$50) fine which will be added to Customer's utility account. Upon a third and all subsequent violations of this section occurring

within Twelve (12) months of the previous violation, the District shall impose a Two Hundred Fifty dollar (\$250) fine which will be added to the Customer's utility account. The District shall not be responsible for any damage to any unpermitted structures located above or within a utility easement the Service Connection caused by the maintenance and/or replacement of any component of the Service.

Section 7.6. Damage to water system facilities.

The customer shall be liable for any damage to the GCSD-owned customer water service facilities, including when such damage is from causes originating on the Premises receiving Service including, but not limited to, acts or omission of customer or their tenants, agents, employees, contractors, licensees or permittees, that result in the breaking or destruction of locks on or near a meter, damage to the electronic read transmitter (ERT), or any damage to a meter that may result from hot water or steam from a boiler or heater on the customer's premises. The GCSD shall be reimbursed by the customer for any such damage promptly on presentation of a bill.

Section 7.7. Pressure Reducing Valve (PRV).

A PRV approved by the General Manager shall be installed and maintained by the customer on each connection where the water pressure at the meter exceeds 80 pounds per square inch (psi), per the Uniform Plumbing Code. The customer shall install the PRV in accordance with direction from the GCSD and in compliance with any applicable code requirements of the County of Tuolumne.



**ARTICLE VIII.**  
**Cross Connection Control**

Section 8.1. Cross-connection control.

8.1.1. Purpose. The GCSD Board declares that the purpose of this section is to protect the public water supply against actual or potential cross-connections by:

8.1.1.1. Requiring abandonment of private wells before premises connect to GCSD water supply or by isolating within the premises contamination or pollution that may occur because of some undiscovered or unauthorized cross-connection on the premises; or the installation of a GCSD approved backflow prevention device will be required;

8.1.1.2. To eliminate existing connections between drinking water systems and other sources of water that are not approved as safe and potable for human consumption;

8.1.1.3. To eliminate cross-connection between the drinking water systems and other sources of water or process water used for any purpose whatsoever which jeopardize the safety of the drinking water supply, or the installation of an approved Backflow Prevention Device;

8.1.1.4. To prevent the making of cross-connections in the future;

8.1.1.5. To protect the drinking water supply within the premises, where plumbing defects or cross-connections may endanger the drinking water supply available on the premises;

8.1.2. This section is to be reasonably interpreted. It is the intent of this section to recognize that there are varying degrees of hazard and to apply the principle that the degree of protection should be commensurate with the degree of hazard as determined by the District.

8.1.3. Definitions. For the purpose of this section 8.1, the following words and phrases shall have the meaning respectively ascribed to them by this section:

8.1.3.1. “Air-gap separation” means a physical break between a supply pipe and a receiving vessel. The air-gap shall be at least 2.5 times the diameter of the supply pipe, measured vertically above the top rim of the vessel. Supply pipes less than one-inch diameter shall have a minimum air-gap of 2.5 inches.

8.1.3.2. “Approved” means as approved by GCSD and, where appropriate, Tuolumne County.

8.1.3.3. “Double check-valve assembly” means an Approved assembly of two independently acting, approved check valves, including tightly closing shut-off valves on each

end of the check-valve assembly and suitable connections available for testing the water tightness of each valve. To be approved these devices must be readily accessible for maintenance and testing and in no case shall be less than 12 inches above the flood level of the surrounding ground or floor and in a location where no part of the assembly will be submerged.

8.1.3.4. “Reduced pressure principle backflow prevention device” means an Approved device incorporating two or more independently acting, approved check valves and an automatically operating differential relief valve located between the two checks, two shut-off valves, and equipped with necessary appurtenances for testing. The device shall operate to maintain the pressure in the zone between the two check valves less than the pressure on the public water supply side of the device. At cessation of normal flow, the pressure between check valves shall be less than the supply pressure. In case of leakage of either check valve, the differential relief valve shall operate to maintain this reduced pressure by discharging to the atmosphere. When the inlet pressure is two pounds per square inch or less, the relief valve shall open to the atmosphere thereby providing an air-gap in the device. To be approved, these devices must be readily accessible for maintenance and testing and installed not less than 12 inches above the flood level of the surrounding ground or floor in a location where no part of the valves max height will be submerged.

8.1.3.5. “Water supply” means any water supply Approved by the GCSD.

8.1.3.6. “Auxiliary water supply” means an Approved water supply originating on the premises that is used exclusively for fire protection or irrigation and is not connected in any manner to the domestic supply system on the premises. An auxiliary supply shall be a water supply that has been developed exclusively for the purpose of either fire protection or irrigation or both. The presence of an auxiliary water supply will require the installation of a GCSD approved backflow prevention device.

8.1.3.7. “Cross-connection” means any physical connections between the piping system from the GCSD service and that of any other water supply that is not, or cannot be, approved as safe and potable for human consumption, whereby water from the unapproved source may be forced or drawn into the GCSD distribution mains.

8.1.3.8. “Health hazard” means an actual or potential threat of contamination of a physical or toxic nature to the public potable water system or the consumer’s potable water system to such a degree or intensity that there would be a danger to health.

8.1.3.9. “Pollution hazard” means an actual or potential threat to the physical properties of the water system or the potability of the public water supply but which would not constitute a health or system hazard as defined.

8.1.3.10. “System hazard” means an actual or potential threat of severe damage to the public potable water system, or the consumer’s potable water system, or of a pollution or contamination which would have a protracted effect on the quality of potable water in the system.

8.1.3.11. “Well” means any artificial excavation constructed by any method for the purpose of extracting water from, or injecting water into, the underground. This definition shall not include:

- (a) Oil and gas wells, or geothermal wells constructed under the jurisdiction of the Department of Conservation, except those wells converted to use as water wells; or
- (b) Wells used for the purpose of dewatering excavation during construction, or stabilizing hillsides or earth embankments.

8.1.4. “Abandonment of Wells”.

8.1.4.1. The owner of property upon which a private well is located shall destroy the well at their expense before being connected to the GCSD Public Water System, or the installation of a GCSD approved backflow prevention device will be required and subject to ongoing maintenance requirements and fees.

8.1.4.2. Abandoned wells shall be destroyed in accordance with the “Well Destruction” standards as set forth in Tuolumne County Well Ordinance 443, Section 3-310, or as subsequently revised or supplemented.

8.1.4.3. The destruction of an abandoned well shall be inspected by and completed to the satisfaction of the Tuolumne County and the GCSD.

8.1.5. Protection of Public Water System at Service Connection. No water service connection to any premises shall be installed or maintained by the GCSD unless the water supply is adequately protected in accordance with the requirements and regulations of Title 17 of the California Administrative Code and these regulations:

8.1.5.1. Each service connection from the public water system for supplying water to premises having an auxiliary water supply shall be protected against backflow of water from the premises into the public water system.

8.1.5.2. Each service connection from the public water system for supplying water to premises on which any substance is or may be handled in such fashion as to permit entry into the water system shall be protected against backflow of the substance from the premises into the public system. This shall include the handling of process water and waters originating from the public water supply system which have been subject to deterioration in sanitary quality.

8.1.5.3. Approved backflow prevention devices shall be installed on service connections to any premises where internal cross-connections exist. The District conducts annual testing and/or maintenance that will be billed to the property owner. The Property owner can choose to test and maintain protective device with a certified backflow Tester from CA/NV AWWA, and must submit results to the District annually.

#### 8.1.6. Types of Protection.

8.1.6.1. The protection device required shall depend upon the degree of hazard. An air-gap separation or a reduced pressure backflow prevention device shall be used where there is an existing or potential health or system hazard. A double check-valve assembly may be used where there is an existing or potential pollution hazard determined by the District.

8.1.6.2. The public water system shall be protected at the service connection as specified below at the cost of the Property Owner:

(a) At the service connection to any premises where there is allowed an auxiliary water supply, handled in a separate piping system with no known or easily established cross connection, the public water supply shall be protected by an approved double check-valve assembly. When the auxiliary water supply may be contaminated, an air-gap or approved reduced pressure principle backflow prevention device shall be installed at the service connection.

(b) At the service connection to any premises on which a substance that would be objectionable, but not hazardous to health, if introduced into the public water supply, is handled so as to constitute a cross-connection, the public water supply shall be protected by an approved double check-valve assembly.

(c) At the service connection to any premises on which there is an auxiliary water supply where cross-connections are known to exist, the public water supply shall be protected by an approved reduced pressure principle backflow prevention device.

(d) At the service connection to any premises on which a material dangerous to health or toxic substance in toxic concentration is or may be handled in such a manner as to permit its entry into the water system, the public water supply shall be protected by an air-gap separation. The air-gap shall be located as close as practicable to the meter and all piping between the meter and receiving tank shall be entirely visible. If these conditions cannot be reasonably met, the public water supply shall be protected with an approved reduced pressure principle backflow prevention device, providing the alternative is acceptable to both the GCSD and the Tuolumne County health officer.

(e) At the service connection to any sewage treatment plant, sewage pumping station, or storm water pumping station, the public water supply shall be protected by an air-gap separation. The air-gap shall be located as close as practicable to the meter and all piping between the meter and receiving tank shall be entirely visible. If these conditions cannot be

reasonably met, the public water supply shall be protected with an approved reduced pressure principle backflow prevention device, providing there are no direct connections to sewage pumps or waste lines and this alternative is acceptable to both the GCSO and county health officer. Final decision in this matter shall rest with the State Department of Health.

(f) At the service connection to hospitals, medical buildings, mortuaries and other premises where the county health officer and/or the GCSO determines that a special hazard exists, the public water supply shall be protected by an approved reduced pressure principle backflow device.

(g) Where a health or safety hazard exists on a premises by reason of any existing plumbing installation, or lack thereof, the owner or his agent shall install additional plumbing or make such connection as deemed necessary to abate the hazard and bring the plumbing system into compliance with applicable provisions of this chapter.

8.1.6.3. All Customers with existing and future service connections to its water system shall be subject to the following:

(a) Inspection of all premises for plumbed cross-connections or other actual or potential backflow hazards including but not limited to auxiliary water systems such as private wells, landscape irrigation systems, water-using commercial or industrial equipment, stock-watering facilities, hot tubs, pools, solar panels and HVAC heat exchangers.

(b) Installation of a backflow prevention devices approved by the District as a condition of water service where required by the General Manager. Any premises without an approved backflow prevention device and/or cross connection control shall be subject to shut off and discontinuance of water service. Discontinue water service immediately upon detection of an imminent sanitary threat to the District water supply due to an actual or potential backflow situation on any customer premises, including normal charges for resumption of service and reconnection of a discontinued service after customer fully compliance with District backflow prevention requirements.

(c) All backflow prevention devices shall be installed at or near water service connections (adjacent to water meter) or when such installation is impractical as determined by the General Manager, at another location as determined by the General Manager.

(d) All backflow prevention devices shall be subject to regular inspection as determined by the General Manager and testing upon installation, repair.

(e) The Customer shall be responsible for maintaining and all repairs necessary to insure proper operation of the backflow prevention device at all times.

(f) All backflow prevention devices determined by the District to require major repairs or replacement shall be repaired or replaced at the expense of the Customer.

8.1.6.4. The property owner or consumer who is responsible for any protective device installed on a fire protection system shall have such device inspected and tested in accordance with requirements of the GCSD and county health department. The GCSD shall be furnished with a copy of the test result on an annual basis by July 1st. Persons testing protective devices shall be qualified and approved by the GCSD and county department of public health.

8.1.7. Failure to Comply. Failure to comply with any part of this section may be cause for the discontinuance of water service by the GCSD and/or the county department of public health. The GCSD shall give notice in writing of any violations of this chapter to the property owner and consumer. If no action is taken within 10 days after such notice has been mailed or delivered in person, the GCSD may discontinue delivery of water. If it is determined by either the GCSD or the Tuolumne County health officer that any immediate hazard exists as a result of failure to comply, the GCSD may immediately discontinue service to the premises. Delivery of water shall not be resumed until a protective device has been properly installed and approved as provided in this section.

**ARTICLE IX.**  
**Liability for Service Charges**

Section 9.1. Liability for Charges.

9.1.1. The property owner, as determined by the real property tax roll of the county assessor, is liable for payment of water service provided by the District either directly, through contract or permit, and shall be liable for the rates, charges and fees for that service as established by the District. In situations where someone other than the owner occupies the property receiving the service, the owner of the property shall be primarily liable for payment of services regardless of whether the owner authorizes the monthly bills to be sent to someone other than the owner.

9.1.2. It is the responsibility of the owner of the real property to provide the District with the current billing address and to notify the District of any changes of address.

9.1.3. It shall be and is hereby made the duty of each property owner to ascertain from the District the amount and due date of any rates, charges and fees for which the owner is liable. It shall also be and is hereby made the duty of each owner liable for the rates, charges and fees to inform the District immediately of all circumstances and of any change(s) in any circumstances which will in any way affect the applicability or the amount of any rates, charges and fees to premises where water service is being received.

9.1.4. Upon the written direction and consent of the property owner using a form provided by the District, the property owner can direct the bills containing the charges for service be sent to a person other than the property owner, including a tenant of the property, for payment. Regardless of whether the designated person pays the bills, the owner of the property shall remain liable for all charges for service, including delinquent charges and penalties.

**ARTICLE X.  
Rates and Fees**

Section 10.1. Standard Rate Schedule.

Standard monthly rates for regular water service are established in Table A. Standard monthly water rates are divided into four components: fixed charge, usage (variable) charge, bond debt repayment (such as Revenue Improvement District Bond debt), and private fire service. The charges are dependent of water meter size established to account for the fact that additional service capacity needed in the water system to accommodate the higher flow rate potential of the larger water meters, which are quantified by equivalent meter unit (EMU), as determined in the GCSD Water Rate Study by Hilton Farnkopf & Hobson, November 1, 1995. Standard monthly fixed rates, Variable rate Fire service rate, and Bond debt charge for regular monthly water service are provided in the following subsections.

10.1.1. Fixed Rate. The District incurs regular, ongoing costs associated with operating the buildings, grounds, and facilities of the District, irrespective of that quantity of water used by District customers or the occupancy status of the dwelling unit. The fixed rate is established in Table A.

10.1.2. Variable Rate. As water is pumped and distributed to its customers, the District incurs variable expenses that are proportional to the amount of water delivered. The variable rate is established in Table A.

10.1.3. Debt Service. The District has from time to time sold bonds to fund capital improvement projects. Debt is generally repaid on a semi-annual basis over a period ranging from 20 to 30 years. The amount of the monthly debt service charge is based on meter size, using the meter size equivalency calculated by Hilton, Farnhopf & Hobson, 1995 and is established in Table A.

10.1.4. Fire Service. Some structures have fire sprinkler systems that are separate from the structures main water service. Because private fire service systems are only used occasionally (during fires and testing), the Board considers a reduced rate from the normal fixed monthly rate fair and equitable for operators of private fire service systems. The fixed monthly standby rate for these systems is established in Table A.

Section 10.2. Single Service Connection-Multiple Use.

10.2.1. Single Dwelling. Single dwellings pay a service charge based on the size of the existing meter. Each additional and separate dwelling serviced through a single metered service connection, whether occupied or not, shall pay an added minimum service charge based on the ¾ inch meter rate.

10.2.2. Multiple Dwelling. Multiple Dwellings, such as duplexes, apartments, and community housing projects, in addition to the appropriate rate established for the size of the



existing meter, shall pay a monthly service charge based on the ¾ inch meter size rate for each unit in excess of one.

10.2.3. Hotels and Motels. Hotels and motels shall pay a monthly service charge based on the size of the existing meter (see subsection G).

10.2.4. Combined Dwelling and Business Units. Dwelling units combined with professional, commercial units, in addition to the appropriate rate established for the size of the existing meter, shall pay a monthly service charge based on the ¾inch meter size rate for each unit in excess of one.

10.2.5. Combined Business Units. Where two or more businesses, professional or commercial units occupy a single premise, in addition to the appropriate minimum rate established for the size of the existing meter, each additional unit in excess of one, shall pay a monthly service charge based on the ¾ inch meter size.

10.2.6. Permanent Occupancy of Hotels, Motels, and Trailer Parks. Subsection C, notwithstanding, any hotel or motel unit with complete living facilities, or trailer in a trailer park, occupied for more than thirty (30) days, shall pay an additional monthly service charge per unit based on the ¾inch meter size rate.

Section 10.3. New Business-Duty to Notify District.

Owners or proprietors of newly established businesses, professional, or commercial enterprises shall notify the District that such business is being conducted within thirty (30) days of inception.

Section 10.4. Charges for Special Uses.

Rates for water supply special uses not cited herein shall be determined in each case by agreement between the District and the user.

**ARTICLE XI.**  
**Billings and Enforcement of Charges**

Section 11.1. Billing period.

The regular billing period will be monthly or bimonthly at the option of the GCSD. Water consumption charges will be for the regular billing period immediately prior to the bill and based on metered water usage.

Section 11.2. Opening and closing bills.

Opening and closing of service for less than the normal billing period shall be prorated; provided, however, that the total period for which service is rendered is less than one month, the bill shall not be less than the monthly fixed rate service charge. Closing service bills may be estimated by the GCSD for the final period as an expediency measure to permit the customer to pay the closing bill at the time service is discontinued.

Section 11.3. Payment of bills.

Bills for water service shall be rendered on or about the first business day of each month. Water Bills for Service are due by the last day of the month in which they are billed, or a ten percent (10%) penalty shall be added. An additional penalty shall be payable in an amount equal to one-half percent (0.5%) of the unpaid water service charges plus the basic 10% penalty for each month until all delinquent charges and penalties have been paid by the property owner. If the bill is not paid by the 15<sup>th</sup> of the following month, the water service may be shut off and an additional charge shall be paid in order to have the water turned back on. When service is discontinued due to nonpayment of bills, it shall not again be resumed until payment of all charges (past due and current) are made in full. All penalties provided for in this chapter shall be paid whether or not water service is discontinued.

Section 11.4. Billing of separate connections combined.

Combined bills may be rendered for all service connections to the same premises.

11.4.1. Past Due Accounts. Rates and charges that are not paid on or before the last day of the month shall be subject to a penalty of ten percent (10%) and thereafter shall be subject to a further penalty on one-half percent (0.5%) per month for non-payment of the delinquent charges.

Section 11.5. Enforcement of Payment.

Upon failure of payment for delinquent water service charges, or if the owner or occupant of any premises shall violate any of the provisions hereof, any one or more of the following actions authorized by this Article may be taken by District to enforce such payment.

11.5.1. Notifications. Delinquency notices will appear on the billing statement generated on the first business day of the month. Past due charges will be clear and identifiable, and past due policy will be visible. If the account remains unpaid, a final disconnection notice will be made via telephone call to the number on file, the Friday before the 15<sup>th</sup> day of the month.

11.5.2. Mailing Address for Owner Notifications. The District will use the address and on file with the District as provided by the owner for the mailing of all notices.

Section 11.6. Repayment Plan.

Subject to interest and penalties along with all other charges of fees levied by this article, the General Manager may permit continuance of use for water service upon the customer's written agreement to comply with all terms and conditions of a short term re-payment plan. The plan shall include the following requirements:

11.6.1. The customers' account must be brought current by the end of the repayment plan term.

11.6.2. Failure to comply with agreed to terms and conditions will result in a discontinuance of service.

Section 11.7. Water use charges as lien.

Notwithstanding any other provision of this chapter, water service charges and penalties shall constitute a lien against the premises against which the charges for water service remains delinquent for a period of 60 days. The lien shall be recorded in accordance with Government Code Section 6115(c).

Section 11.8. Liens Release.

District costs to prepare, record and release liens for delinquent charges shall be paid prior to release of such liens. District costs to be paid per lien released are established in Table A.

Section 11.9. Dishonored Checks.

If the dishonored check was paid to avoid disconnection of service, then the responsible party will be contacted immediately and given two (2) days to honor the check. If the District receives two dishonored checks, cash payment (cash or a cashier's check) of all future utility bills may be required, together with charges for dishonored checks established in Table A.

Section 11.10. Fees for Cross-Connection Control Program.

A customer may be required by law or District Ordinance to install a backflow prevention device within his premises. The District will charge the actual cost of the device, and labor charges for the installation of the backflow prevention device. A backflow prevention device is required by law to be inspected annually. Inspection and repair charges shall be paid after receipt of billing mailed with District requirements for the approved backflow prevention device. The District may choose to subcontract the inspection and repair costs for backflow prevention devices.

Any owner of three or more backflow prevention devices shall receive a 30% discount in annual testing fees if the customer pre-arranges a specific time with the District to do all the testing at one time. Testing fees are established in Table A.

**Section 11.8. Collection of Delinquent Charges on Tax Roll.**

For any water charges which have been delinquent for sixty (60) days, the General Manager shall cause a written report to be prepared and filed with the District Secretary pursuant to Government Code Section 61115, and the Secretary shall thereupon cause notice to be given and published of a public hearing before the Board on the issue of placement of such delinquent charges and penalties upon the County Property Tax Roll for collection. Upon conclusion of the hearing, the Board of Directors may determine to collect such delinquent charges and penalties upon the County Property Tax Roll for the affected parcel of property. Upon such determination by the Board of Directors by resolution, the District's Secretary shall thereafter file with the County Auditor the report adopted by the Board at such public hearing and request that the delinquent charges and penalties be added to and collected with property taxes on said property at the same time and in the same manner as property taxes are collected by the County Auditor.

**Section 11.9. Collection by Legal Action.**

The General Manager may institute and prosecute appropriate legal action for the collection of delinquent water charges and penalties. By its application for and receipt of water services, property owner/customer hereby agrees to be responsible for reimbursement to the District of all attorneys' fees and other legal costs incurred by District in collecting any delinquent charges and penalties from the property owner/customer through such legal action.

**Section 11.10. Customers Filing for Bankruptcy.**

Upon the filing for bankruptcy protection, the customer shall immediately notify the District of the filing. Customers filing for bankruptcy shall within 30 days deposit with the District the equivalent of two months of monthly charges as determined by the General Manager. The General Manager shall have discretion to reduce the deposit amount when he determines that the risk of delinquent payments are low. The District shall be entitled to collect any post bankruptcy filing delinquencies from the deposited amount. Upon notice, the customer shall replenish the deposit to the amount required by the General Manager within 10 days notice from the District. The Deposit shall be required for a period of 12 months following discharge from bankruptcy.

**ARTICLE XII.**  
**Discontinuance of Service**

Section 12.1. Discontinuance of Service for Delinquent Bills.

12.1.1. The District may discontinue service for non-payment of bills. Current billing reflects the past due balance due immediately. At least five (5) days prior to discontinuance of such service, the customer or property owner will be sent a Final Notice phone call to notify that the discontinuance of service will be enforced if payment is not made by 4pm on the 15<sup>th</sup> business day of the Month. The failure of the District to send or any such person to receive such notice shall not affect the District's power to discontinue services pursuant to this section. The customer's water service may be discontinued if water service furnished to the previous location is not paid for within the time fixed for the payment of bills. Reconnection will be made by the District only upon complete payment of all delinquent service charges, penalties, and disconnection fees are paid in full as specified in this ordinance.

12.1.2. Disconnection of Service. Any account with an outstanding balance after the due date listed in the disconnection notice, shall have water service disconnected and meter will be fixed with a District lock, and charged the Disconnection fee as established in Table A.

12.1.3. Reinstatement of Services. In situations where water service has been terminated or the meter has been removed, the water meter will not be re-installed until all applicable charges have been paid including any outstanding water bills, meter installation fees, customer activation fee, or any costs damage to the District.

Section 12.2. Discontinuance of Service for Non-Delinquencies.

The District may terminate Service to a Customer for any of the reasons set forth in this section.

12.2.1. Violation of this Ordinance.

12.2.2. Violation of Applicable County ordinances or regulations.

12.2.3. Violation of State or Federal laws and regulations.

12.2.4. Unsafe apparatus. Water service may be refused or discontinued to any premises where apparatus or appliances are in use which might endanger or disturb the service to other customers.

12.2.5. Fraud or abuse. Service may be discontinued if necessary to protect the GCSD against fraud or abuse.

Section 12.3. Reconnection charge.

Service will not be reconnected until payment of charges for reconnection established in Table A. Services will not be reconnected after 8 pm Sunday through Thursday, or after 9 pm

Friday and Saturday. Reconnection will not occur until all reconnection fees and the full account balance has been paid to GCSD.

Section 12.4. Changes in Ownership.

Upon a change in the ownership of premises, the existing owner shall notify the District five business days prior to the transfer of title to the property to the new owner. Escrow Demands for the total amount of service charges due at the time of transfer upon the selling of a property and the recorded deed in the new owners name is required to transfer the service to the new owner. The prior owner shall be liable for all charges, whether or not any water is used, prior to the transfer of service as set forth in this subsection.

Section 12.5. Temporary Suspension of Service.

Upon written request from a property owner that exceptional circumstances beyond personal control of the Owner/User prevents habitation or use of the water service for at least six (6) months, monthly fixed and variable water charges may be suspended in part as determined by the General Manager. However, the General Manager shall not have authority to suspend debt service charges attributable to the premises which shall continue to be billed by the District. Such suspension of service shall be dependent upon approval of District's General Manager.

Customers receiving a temporary suspension of service shall notify the District in writing at least ten (10) business days before resuming use of water service. Thereafter regular billing of the Customer will resume. If Customer resumes use of water service before written notice to the District, the Customer shall be subject to a penalty as determined by the General Manager of up to twice the normal full charges that would have been billed during the suspension period.

Section 12.6. Voluntary Termination of Service.

Upon written request of a property owner, all water service to the premises may be terminated and account will be subject to meter removal fee as established in Table A. If the property owner wishes to reinstate service in the future, they shall apply for new service in accordance with this Ordinance, including paying all charges and fees associated with a new service.

**ARTICLE XIII.**  
**Public Fire Protection**

Section 13.1. Use of fire hydrants.

Fire hydrants are for use by the GCSD or by organized fire protection agencies. Other parties desiring to use fire hydrants for any purpose must first obtain written permission from the GCSD prior to use and shall operate the hydrant in accordance with instructions issued by the GCSD. Unauthorized use of hydrants will be prosecuted according to law.

Section 13.2. Hydrant rental.

A charge to be prescribed from time to time by the Board by resolution will be imposed for hydrant maintenance and water used for public fire protection.

Section 13.3. Moving of fire hydrants.

When a fire hydrant has been installed in the location specified by the proper authority, the GCSD has fulfilled its obligation. If a property owner or other party desires a change in the size, type or location of the hydrant, they shall bear all costs of such changes, without refund. Any change in the location of a fire hydrant must be approved by the Board.

**ARTICLE XIV.**  
**Private Fire Protection and Standby Service**

Section 14.1. Payment of cost.

The applicant for private fire protection service not now installed shall pay the total actual cost of installation of the service from the distribution main to the customer's premises including the cost of a detector check meter or other suitable and equivalent device, valve and meter box, said installation may become the property of the GCSD as determined by the General Manager. All costs are to be the responsibility of the Applicant. Installation of service and connection to the main line is to be completed by GCSD, or a GCSD approved Contractor.

Section 14.2. No connection to other system.

There shall be no connections between this fire protection system and any other water distribution system on the premises.

Section 14.3. Use.

There shall be no water used through the fire protection service except to extinguish fires and for testing the firefighting equipment.

Section 14.4. Meter rates.

Any consumption recorded on the meter will be charged at double the regular service rates except that no charge will be made for water used to extinguish accidental fires where such fires have been reported to the duly authorized fire protection agency.

Section 14.5. Monthly rates.

The monthly rates for private fire protection are established in Table A.

Section 14.6. Water for fire storage tanks.

Occasionally water may be obtained from a private fire service for filling a tank connected with the fire service, but only if written permission is secured from the GCSD in advance and an approved means of measurement is available. The rate for water so used shall be established by the GCSD at the time application for such service is made.

Section 14.7. Violation of agreement.

If water is used from a private fire service in violation of the agreement or of these regulations, the GCSD may, at its option, discontinue and remove the service.

Section 14.8. Water pressure and supply.

The GCSD assumes no responsibility for loss or damage due to lack of water or pressure and merely agrees to furnish such quantities and pressures as are available in its general distribution system. The service is subject to shutdowns and variations required by the operation of the system.



Section 14.9. Standby Service Rate.

Private fire protection service shall be charged Private Fire Service Standby Rate as established in Table A.

**ARTICLE XV.**  
**Temporary Services**

Section 15.1. Approval of Temporary Service Requests.

The General Manager shall have the sole discretion on whether to grant a request for temporary service under this Article.

Section 15.2. Duration of service.

Temporary service connections shall be disconnected and terminated within six months after installation unless an extension of time is granted in writing by the General Manager.

Section 15.3. Deposit.

The applicant shall deposit in advance an amount equal to \$175.00 for each inch of meter diameter of service the applicant applies for. Upon discontinuance of service, the actual cost of installing and removing the facilities required to furnish said service, exclusive of the cost of salvageable material, shall be determined and an adjustment made as an additional charge, refund or credit.

If service is supplied through a fire hydrant, the applicant will be charged in accordance with the rate schedule established in Table A.

Section 15.4. Installation and operation.

All facilities for temporary service to the customer connection shall be made by the GCSD and shall be operated in accordance with its instructions.

Section 15.5. Responsibility for installation.

The customer shall use all possible care to prevent damage to any loaned facilities of the GCSD which are involved in furnishing the temporary services from the time they are installed until they are removed, or until 48 hours' notice in writing has been given to the GCSD that the contractor or other person is through with the installation. If the facilities are damaged, the cost of making repairs shall be paid by the customer.

Section 15.6. Temporary service from a fire hydrant.

If temporary service is supplied through a fire hydrant, an application for the use of the hydrant shall be obtained from GCSD. It is specifically prohibited to operate the valve of any fire hydrant other than by the use of a spanner wrench designed for this purpose.

Section 15.7. Unauthorized use of hydrants.

Tampering with any fire hydrant or the unauthorized use of water therefrom, or for any other purpose, is a misdemeanor, punishable by law, and subject to a fine plus services charges established in Table A.

Section 15.8. Rates.

The rates for temporary service shall be established by the General Manager at the time application for such service is made.



**ARTICLE XVI.**  
**Rates**

Section 16.1. Rate schedule.

Rates for water service shall be established from time to time by resolution of the Board as authorized by Government Code Section 61115.

Section 16.2. Determination of applicable rate.

Upon receipt of any application for water service, the General Manager shall determine the applicable monthly rate based on the size of the service.

Section 16.3. Penalty for violation.

For the failure of the customer to comply with all or any part of this ordinance, and any ordinance, resolution or order fixing rates and charges of this GCSD, customer's service shall be discontinued and the water shall not be supplied such customer until he shall comply with the rule or regulation, rate or charge which they have violated or, in the event that they cannot comply with said rule or regulation, until they shall have satisfied the GCSD that in the future they will comply with all the rules and regulations established by ordinance of the GCSD and with all rates and charges of this GCSD.

**ARTICLE XVII.  
Drought Restrictions**

Section 17.1. Definitions.

The following terms are defined for the purpose of this article:

17.1.1. "Allocation" means the calculated percentage of the amount of water delivered to each customer's property during the corresponding monthly billing period of the base year for which no penalty or surplus use charges shall be imposed.

17.1.2. "Applicant" means a customer, firm, partnership, business, corporation, district or governmental agency that requests or receives water from the District.

17.1.3. "Board of Directors" means the Board of Directors of the Groveland Community Services District.

17.1.4. "Customer" or "water consumer" means any customer, firm, partnership, business, corporation, district, or governmental agency that receives water from the District.

17.1.5. "District" means the Groveland Community Services District.

17.1.6. "General Manager" means the General Manager of the District duly appointed by the Board of Directors.

17.1.7. "Water" means potable water supplied by the District to customers within its jurisdiction.

Section 17.2. Purpose and Scope.

This article sets forth water shortage emergency conditions which exist within the boundary of the Groveland Community Services District as declared by resolution of the Board of Directors. These regulations shall become effective with the effective date of the ordinance that includes the provisions of this article. A water shortage emergency declaration shall be in effect upon proper findings made by the Board of Directors after a public hearing and shall remain in effect until the Board of Directors finds and declares by resolution that the water shortage emergency condition has abated, has changed in degree or no longer exists.

Section 17.3. Findings.

The Board of Directors shall make the findings below prior to enforcement of the provisions of this article:

17.3.1. The Board of Directors shall conduct duly noticed public hearings for the purpose of determining whether a water shortage emergency condition exists and, if so, the degree of the emergency and what regulations and restrictions should be enforced in response to the shortage.

17.3.2. The Board of Directors shall adopt a resolution which declares that a water shortage emergency condition exists, the facts and conclusions which support such a declaration and that the ordinary water demands and requirements of water consumers within the District cannot be satisfied.

17.3.3. The regulations set forth in this article are necessary and proper to protect and conserve the water supply for human consumption, sanitation, and fire protection during the duration of the water shortage emergency condition.

17.3.4. The regulations set forth in this article shall remain enforceable to the extent declared by the Board of Directors and until such time as the Board of Directors finds that the water shortage emergency no longer exists.

Section 17.4. Phases of Water Shortage Emergencies.

The following phases of water shortage emergencies are established. Upon declaration of the Board of Directors that an emergency condition exists, the Board of Directors shall declare the degree of emergency and identify the applicable phase and the regulations, which shall be enforceable for each respective phase. The District recognizes 4 phases of a water shortage emergency as set forth in this section.

17.4.1. Phase 1—Ongoing Water Conservation. The District shall implement the following Phase 1 water conservation measures at all times regardless of the existence of a water shortage emergency:

17.4.1.1. Education programs

17.4.1.2. Promotion of water-saving landscaping.

17.4.1.3. Requirement of low-flow fixtures in new developments.

17.4.1.4. Meter and/or flow control for all customer accounts and plant production activities.

17.4.1.5. Maintain tiered water rates for treated water.

17.4.1.6. Prohibit wasteful use of water.

17.4.1.7. Review water measuring and/or metering devices for accuracy.

17.4.2. Phase II – Voluntary Conservation Measures. Upon the findings of the Board of Directors in accordance with Section 18.03 that there is a potential threat of an emergency or water shortage based on forecasted precipitation, snowpack and reservoir levels, or if San Francisco Public Utilities Commission calls for Phase II conservation measures, the District shall adopt a resolution that implements the following measures:

17.4.2.1. Declare a threat of emergency or shortage exists; and

17.4.2.2. Identify a water reduction goal of ten percent (10%); and

17.4.2.3. Immediately implement the following Phase II conservation measures:

- (a) Increase public awareness.
- (b) Prohibit fire hydrant flow testing.
- (c) Restaurants shall serve water only upon customer request.
- (d) Voluntary customer water usage reduction. Water customers will be notified that it is a low water year and will be requested to reduce water usage from the previous year's usage. The District will provide information on conservation methods.
- (e) Contact high water users. The District will contact the highest water users to encourage use of water conservation methods.

17.4.3. Phase III – Mandatory Water Conservation Measures. Upon the findings of the Board of Directors in accordance with Section 18.03 that an emergency or water shortage exists based on forecasted precipitation, snowpack and reservoir levels, or if San Francisco Public Utilities Commission calls for Phase III conservation measures, the District shall adopt a resolution that implements the following measures:

17.4.3.1. Declare a state of emergency for the District service area until such time that the District determines that conditions no longer merit Phase III conservation measures; and

17.4.3.2. Identify a water reduction goal of twenty percent (20%); and

17.4.3.3. Immediately implement the following Phase III conservation measures:

- (a) All measures identified in Phase II.
- (b) Establish a Phase III water reduction goal based on the severity of the emergency for approval by the District.
  - (1) If the San Francisco Public Utilities Commission has declared Phase III conservation measures, the District's water reduction goal must match or exceed the water reduction goal identified by the San Francisco Public Utilities Commission. The water reduction goal will be defined as a percentage reduction of the prior year's water usage and may be updated as conditions change.
  - (2) The meeting to consider the resolution adopting the Phase III measures shall be a public hearing providing customers the

opportunity to be heard regarding the declaration of water shortage emergency conditions.

(c) Landscape watering restrictions:

(1) Watering of lawns, gardens and other outdoor vegetation by use of irrigation systems, hoses, faucets or other outlets connected to the public water supply is prohibited, unless specified otherwise below.

(2) Individual garden plants or trees may be irrigated only by the use of buckets, containers or properly maintained irrigation drip systems.

(3) Watering lawns is allowed whenever the water reduction goal is forty percent (40%) or less.

(d) Landscape watering allowed under this section may only be undertaken at the following times:

(1) Properties with addresses ending in an even number may irrigate only on Tuesday and Thursday.

(2) Properties with addresses ending in an odd number may irrigate only on Wednesday and Friday.

(3) Irrigation may occur only between 7:00 p.m. and 9:00 a.m.

(e) Irrigation which results in water running onto driveways, gutters, streets, adjoining property, and/or any other water runoff is prohibited.

(f) Washing of cars, boats, trailers, equipment or other vehicles by hose or by use of water directly from faucets or outlets connected to the public water supply is prohibited. Washing such vehicles may occur at District approved commercial washing facilities that utilize water recycling capabilities.

(g) Washing of sidewalks, walkways, driveways, patios, parking lots, graveled areas, tennis courts or other hard-surfaced areas, including residential and commercial establishments, by hose or by use of water from faucets or other outlets connected to the public water supply is prohibited.

(h) New construction service applications shall be granted upon condition that water shall be used only for interior purposes and landscaping that does not require watering. Any landscaping requiring the use of water



shall be delayed until repeal of Phase III restrictions.

(i) Use of water in decorative fountains, pools, recreational ponds and the like shall be limited to the minimum necessary to preserve aquatic life if present.

(j) Use of water for dust control, earth compaction, and other outdoor construction activities is prohibited.

(k) Filling of new or existing swimming pools, spas and recreation ponds is prohibited.

(l) Fire hydrants shall be used only for emergency purposes.

(m) Leak restrictions:

(1) Allowing any plumbing system leak to remain un-repaired, without reasonable cause as determined by the District, for seven calendar days following written notification by the District is prohibited.

(2) Failure to repair leaks as specified is subject to the following special enforcement:

(i) Water service will be shut off until such time that leak(s) are repaired.

(ii) Reinstatement of water service will be subject to the fees listed on the District's most current rate schedule.

(n) Excessive Water Use:

(1) Excessive water use, without reasonable cause as determined by the District, is prohibited.

(2) Excessive water use is defined as monthly water use that exceeds a certain percentage of the prior year's usage for the same month. This percentage varies based on the reduction goal and is determined by the following chart:

Reduction Goal	Excessive Use Percentage
20% to 25%	90%
30% to 35%	85%
40% to 45%	80%
50%	75%

If the reduction goal is 40%, excessive water use is monthly use that exceeds 80% of last year's monthly use.

(3) Monthly water use less than 4,000 gallons will not be considered excessive.

(4) Commercial and industrial customers may contact the District to discuss the individual water needs required to maintain their business.

(5) Excessive water use is subject to the following special enforcement:

(i) First Violation: Customer will receive a written warning from the District that a further violation will result in water restrictions and penalties.

(ii) Second Violation: Payment of \$50 penalty.

(iii) Third Violation: Payment of a \$100 penalty and customer's service will be restricted by a flow restriction device for 30 days.

(iv) Fourth Violation: Payment of a \$500 penalty and customer's water service will be restricted by a flow restriction device until the District repeals the state of emergency, threat of emergency or shortage.

(v) Continued Violation: Payment of a \$500 penalty and continued water service restriction. The District may, in its discretion, pursue misdemeanor charges pursuant to Water Code Section 71644 which may result in imprisonment in the county jail for not more than 30 days, or by fine not exceeding \$600, or by both.

17.4.4. Phase IV – Mandatory Conservation Measures for Extreme Emergency. Upon the findings of the Board of Directors in accordance with Section 18.03 that an extreme emergency or water shortage exists based on forecasted precipitation, snowpack and reservoir levels, or an emergency event, or if San Francisco Public Utilities Commission calls for Phase IV conservation measures, the District shall adopt a resolution that implements the following measures:

17.4.4.1. Declare a state of emergency for the District service area until such time that the District Board of Directors determines that conditions no longer merit Phase III conservation measures; and

17.4.4.2. Identify a water reduction goal of up to fifty percent (50%); and

17.4.4.3. Immediately implement the following Phase IV conservation measures:

(a) All measures identified in Phase III.

(b) Establish a Phase IV water reduction goal based on the severity of the emergency for approval by the District.

(1) If the San Francisco Public Utilities Commission has declared Phase IV conservation measures, the District's water reduction goal must match or exceed the water reduction goal identified by the San Francisco Public Utilities Commission. The water reduction goal will be defined as a percentage reduction of the prior year's water usage and may not exceed fifty 50%. The water reduction goal may be updated as conditions change.

(2) The meeting to consider the resolution adopting the Phase IV measures shall be a public hearing providing customers for the opportunity to be heard regarding the declaration of water shortage emergency conditions.

(c) Immediately notify appropriate media outlets, and post local road signage notifying the public of the current water use restrictions.

(d) Landscape/outdoor watering by hose or by use of water directly from faucets or outlets connected to the public water supply shall be strictly prohibited.

(e) Excessive Water Use:

(1) Excessive water use, without reasonable cause as determined by the District, is prohibited.

(2) Excessive water use is defined as monthly water use that exceeds a certain percentage of the prior year's usage for the same month. The percentage varies based on the reduction goal and is determined by the following chart:

Reduction Goal	Excessive Use Percentage
20%	90%
25%	85%
30%	80%
35%	75%
40%	70%

45%	65%
50%	60%

If the reduction goal is 40%, excessive water use is monthly use that exceeds 70% of last year’s monthly use.

(3) Monthly water use less than 4,000 gallons will not be considered excessive.

(4) Commercial and industrial customers may contact the District to discuss the individual water needs required to maintain their business.

(5) Excessive water use is subject to the following special enforcement:

(i) First Violation: Customer will receive a written warning from the District that a further violation will result in water restrictions and penalties.

(ii) Second Violation: Payment of a \$50 penalty and customer’s service will be restricted by a flow restriction device for 30 days.

(iii) Third Violation: Payment of a \$100 penalty and customer’s water service will be restricted by a flow restriction device until the District repeals the state of emergency, threat of emergency, or shortage.

(iv) Fourth Violation: Payment of a \$500 penalty and continued water service restriction.

(v) Continued Violation: Payment of a \$500 penalty and continued water service restriction. The District may, in its discretion, pursue misdemeanor charges pursuant to Water Code Section 71644 which may result in imprisonment in the county jail for not more than 30 days, or by fine not exceeding \$600, or by both.

Section 17.5. Request for Increase in Allocation.

17.5.1. All applicants for an increase in allocation during a declared water shortage emergency must submit an application in writing to the District on an application form provided by the General Manager.

17.5.2. The General Manager will review all written requests for increased allocations and the General Manager shall determine if the application is approved, approved with modification, or denied.

17.5.3. All residential applicants for an additional allocation based on additional person residing at the residence shall show proof of residency for all residents at the property.

17.5.4. Water allocations may be adjusted by the General Manager upon written application where the requested adjustment is found to be reasonably necessary. Factors for consideration shall include without limitation:

17.5.4.1. Additional people residing full time at the residence.

17.5.4.2. Unusual medical needs.

17.5.4.3. Change of property use.

17.5.4.4. Where a District audit of nonresidential customer's water-using appliances and usage shows that all reasonable conservation measures are being employed and the applicant provides a conservation plan demonstrating the measures employed and compliance with the plan.

17.5.4.5. Where a nonresidential customer has demonstrated growth in business volume over the base year in providing a water-related service to the public, the allocation may be adjusted at the discretion of the General Manager.

17.5.4.6. Hospitals, health care facilities, nursing care facilities, health clinics, and similar users may be excepted from the percentage reductions provided that a water conservation plan demonstrating reductions in consumption to the maximum extent feasible without jeopardizing patient care is approved by the General Manager.

17.5.5. A decision in writing shall be mailed to the applicant within fifteen (15) days of the receipt of the application.

## Section 17.6. Appeals.

17.6.1. Procedure. Any customer may appeal for reconsideration the General Manager's written decision under Section 18.05 of this article for an increase in allocation. Appeals for reconsideration shall be processed as set forth below.

17.6.1.1. Any customer appealing for reconsideration of the classification or allocation shall do so in writing to the General Manager by either using forms provided by the District or by letter setting forth in detail the reasons for the appeal.

17.6.1.2. The appeal for reconsideration shall be reviewed by the General Manager and a site visit scheduled if required. The General Manager shall also notice a hearing by regular mail whereby the applicant may present their arguments. The notice of hearing to the applicant identifying the date, time and location of the hearing shall be deposited into the U.S. mailed at least 7 calendar days before the hearing.

17.6.1.3. The General Manager shall issue a written decision on the appeal with his/her decision within 10 days of the hearing.

17.6.1.4. If an appeal for reconsideration is sustained, a condition of approval may include a requirement for the installation of water efficient plumbing fixtures and/or irrigation systems.

17.6.1.5. If an applicant disagrees with the General Manager's decision, the decision may be appealed in the same procedural manner as specified in Subsection (a) of this section to the Board of Directors. If an appeal to the Board of Directors is requested, the customer shall be notified of a hearing date by mail. Such hearing shall be scheduled within thirty (30) days of filing the appeal. A decision shall be forwarded to the applicant within fifteen (15) days after completion of the hearing.

17.6.2. Each appeal to the Board of Directors shall be accompanied by the payment of an appeal fee in an amount set by resolution of the Board of Directors from time to time to defray the costs of the appeal to the District.

#### Section 17.7. New Connections Requirements.

All applicants for new water service connections for new construction shall be required to furnish proof of installation in residential, commercial and/or industrial buildings of ultra-low flow toilets with a maximum tank size or flush capacity of 1.6 gallons and shower heads with a maximum flow capacity of 3 gallons per minute.

#### Section 17.8. Financial Assistance.

The District may request that federal and state agencies provide financial and other assistance to residents, water suppliers, water rights holders, ranchers, farmers, business owners and any local governments who are harmed by the drought emergency in its territorial limits to help them mitigate the effects of the persistent drought conditions.”

**ARTICLE XVIII.**  
**Other Fees and Charges**

Section 18.1. Service Connections & Charges.

The District will furnish and install a service of such size and at such location as the applicant requests, provided such requests are reasonable and approved by District. The service will be installed from the water distribution main to the curb line or property line of the premises, which may abut the street, on other thoroughfares, or on District rights-of-way or easements. Charges for new services are payable in advance and shall include charge for the service box, meter, meter installation, and participation fee.

Section 18.2. Charge for Service (Meter) Box.

The charge for a service box with fittings installed by District shall be the actual cost for labor, equipment, and materials determined after installation as established in Table A.

Section 18.3. Meter Charges and Participation Fees.

The District charges a participation fee (also known as “connection fee and capacity charge”) in order to reimburse existing rate payers for the investment they have made to oversize the water system’s facilities so that sufficient excess capacity is available to new customers. Section 66000 of the California Government Code describes how participation fees should be calculated and restricts how the funds collected from such fees can be utilized.

The equivalent meter unit ratio multiplier was calculated for the District by the consulting firm of Hilton, Farnkopf & Hobson, in the Water Rate Study completed for the District on November 1, 1995.

Meter installation charges established in Table A are based on the actual cost for the District to purchase the meter at the time this ordinance was promulgated, plus one man-hour of installation time at the rate of \$25 per hour. The actual prevailing meter cost will be charged to the applicant at the time installation is done.

Section 18.4. Water Connection/Extension Application Fee.

The Water Connection or Extension Application Fee established in Table A covers the District’s administrative costs for new file preparation and provides applicant with copy of agreement form and current fee schedule.

Section 18.5. Administrative Fee for Water Extension.

The non-refundable Water Extension Administrative Fee established in Table A covers the District’s expected administrative staff time, which would involve assistance to the applicant regarding agreement preparation, agenda scheduling, and bookkeeping functions.

Section 18.6. Engineering Deposit for Water Extension.

The Water Extension Engineering Deposit established in Table A covers the District’s actual Engineering (in-house or contracted) time and materials expended for review of CEQA requirements, plan reviews, easement reviews, project management, and construction site and

facility inspections. Any unused money left from the deposit will be credited back to the applicant.

Section 18.7. Meter Test—Deposits.

If a customer desires to have the meter serving the customer's premises tested, they shall first deposit a fee established in Table A.

Section 18.8. Disconnection/Termination Fee.

A disconnection fee plus penalties established in Table A will be made and collected prior to renewing service following discontinuance. If the user calls the District to reconnect service outside of normal District business hours, then the After Hours Reconnection Fee established in Table A shall apply.

Section 18.9. Water Main Extension Fees.

The applicant for water main extension shall submit the required charges and fees established in Table A prior to the District's review, inspection, and final acceptance for the Water Main Extension Project. Funds collected under the Administrative Expense and Engineering Expense Deposits shall maintain a positive balance at all times; any charges in excess of the deposit will be monthly. Any funds collected under the District Engineer Expense Deposit but not used, shall be refunded after the close of the one-year warranty period.

Section 18.10. Temporary Authorized Use of Fire Hydrant Water.

The District may authorize the temporary beneficial use of water from fire hydrants. The District has identified four hydrants throughout the service area from which water can be drawn after receiving permission from the District. The Customer shall pay the applicable fees established in Table A.

Damage to the hydrant and/or meter by the customer shall be repaired at the customer's expense.

Section 18.11. Charge for Unauthorized Use of Fire Hydrants.

In the event any person, other than organized fire protection agencies, makes any connection to a fire hydrant without written permission from the District, the charge established in Table A shall be paid to the District by the person making such connection. Any such unauthorized connection shall be immediately disconnected upon discovery thereof, and no further connection by said person shall be permitted until payment of the charge for unauthorized use plus the estimated water use rendered by the District has been paid.

Section 18.12. Charge for Tampered or Destroyed Meter and Locks.

If the customer places an object that interferes with meter access, tampers with, or destroys a meter lock installed by the District, the charge established in Table A shall be billed to the customer.

A Meter or Curbstop destroyed or damage shall result in a charge to the customer established in Table A.



<b>TABLE A</b>		
<b>MONTHLY FIXED RATE SERVICES CHARGES</b>		
<b>Meter Size</b>	<b>EMU Ratio*</b>	<b>Monthly Charge</b>
5/8-3/4-inch	1.0	\$35.22
1.0-inch	1.6	\$56.36
1.5-inch	2.6	\$91.57
2.0-inch	3.5	\$123.27
3.0-inch	5.5	\$193.70
4.0-inch	7.8	\$274.71
* EMU Ratio used for Monthly Fixed Rate Service Charge is based on non-peak flow rates. Example: for 1.5" Meter, the Base rate (5/8" meter) is \$35.22 times EMU for 1.5" meter (2.6) is \$91.57		
<b>USAGE (VARIABLE) RATE</b>		
<b>Gallons Used per Month</b>	<b>Residential Usage Charge per Gallon</b>	<b>Usage Rate Category</b>
0 to 3300	.0068	Baseline Usage Rate
>3301	.01345	Peak Demand Usage Rate
<b>DISTRICT-WIDE DEBT SERVICE CHARGES</b>		
<b>Meter Charges</b>	<b>EMU Ratio</b>	<b>Monthly Charge</b>
5/8-3/4-inch	1.0	\$20.58
1.0-inch	1.6	\$32.93
1.5-inch	2.6	\$53.51
2.0-inch	3.5	\$72.04
3.0-inch	5.5	\$113.20
4.0-inch	7.8	\$160.52
<b>PRIVATE FIRE SERVICE STANDBY RATE</b>		
<b>Fixed Monthly Standby Rate</b>		
\$10/per month/inch of meter size/connection		
<b>VOLUNTARY TERMINATION OF SERVICE METER REMOVAL FEE</b>		
\$100.00		
<b>APPLICATIONS FOR WATER SERVICE</b>		
\$35.00 where no water main extension is required, plus deposit estimated by District		
\$200.00 where water main extension is required, plus deposit estimated by District		
<b>PROPERTY TRANSFERS</b>		
\$25.00 for unimproved property in RID#1 where Standby and Facilities charges are levied		
\$40.00 for improved properties in the District where water/and or sewer service is provided		
\$15.00 for tenant changes by owner or agent of rental properties		

<b>LIENS</b>			
\$50.00 for Tax Roll Removal			
\$35.00 for Satisfaction of Lien			
<b>DISHONORED CHECKS</b>			
\$35.00 per occurrence			
<b>CROSS-CONNECTION CONTROL PROGRAM-BACKFLOW PREVENTION DEVICE TESTING FEES</b>			
Installation will be actual device cost and labor charges			
\$40.00 annual inspection fee			
Maintenance will be actual labor and materials cost			
\$40.00 retesting fee			
<b>METER BOX</b>			
Actual cost for labor, equipment, and materials. Typical cost ranges from \$400.00-\$1,200.00			
<b>METER CHARGES AND PARTICIPATION FEES</b>			
Meter Size	EMU* Multiplier	Participation Fees	Meter Install Charge
5/8-inch	1.0	\$1,827.00	Actual Cost
¾-inch	1.0	\$1,827.00	Actual Cost
1.0-inch	1.7	\$3,106.00	Actual Cost
1.5-inch	3.3	\$6,029.00	Actual Cost
2.0-inch	5.3	\$9,684.00	Actual Cost
3.0-inch	11.7	\$21,377.00	Actual Cost
4.0-inch	20.0	\$36,542.00	Actual Cost
<p>*EMU Ratio Multiplier used to calculate participation fees is based on peak flow rates, which is slightly higher than the EMU ratio used for calculating monthly fixed rate charges, which uses non-peak flow rates.</p> <p>Example of calculation for 1.5-inch meter: Base participation fee is \$1,827.00 times the EMU ratio multiplier of 3.3 is \$6,029.00.</p>			
<b>METER TEST</b>			
\$25.00 (refunded if meter is reading incorrectly)			
<b>DISCONNECTION FEE</b>			
\$50.00			
<b>AFTER HOURS RECONNECTION FEE</b>			
\$150.00			

<b>TEMPORARY AUTHORIZED USE OF FIRE HYDRANT WATER</b>		
\$100.00 Non-Refundable Service charge for flow meter and backflow device		
\$5.00/day Hydrant Charge		
\$1.39 per 100 gallons		
\$65.00 Hydrant Location Change Charge		
<b>UNAUTHORIZED USE OF FIRE HYDRANTS</b>		
\$1,000.00		
<b>CHARGE FOR TAMPERED OR DESTROYED METER, LOCKS, AND CURBSTOP</b>		
\$50.00 for tampering with or destroying District fixed lock		
\$400.00-\$1,200.00 for tampering with or destroying meter or curbstop (actual material and labor cost will apply)		
<b>WATER MAIN EXTENSION &amp; SERVICE CONNECTION</b>		
Water Extension Application Fee	\$200.00	Covers Administrative cost for new file preparation and provides applicant with copy of Agreement form and current fee schedule. (Section A2.02.3)
District Engineering Expense Deposit	\$1,500.00	Covers actual Engineer's time expended for review of CEQA requirements, plan reviews, easement reviews, project management, and construction site and facility inspections. (Section A2.02.4)
Performance (Security) Bond		Irrevocable Letter of Credit, Performance Bond, or Cash Deposit with the District, shall be provided for estimated cost of the construction project using prevailing wage rates.
Maintenance Bond		After the project is finished, but prior to District acceptance, the owner shall furnish the actual cost of construction. The Maintenance Bond will be set at 25% of the actual cost of the project. The Maintenance Bond shall remain in effect for one year after final acceptance by the District.
Connection Fees		Payable after District acceptance of the Improvement project, but prior to the start of construction. <i>Refer to Meter Charges and Participation Fees</i>
Meter Box	\$400.00-\$1,200.00	<i>Refer to Meter Box</i>

**APPENDIX J**  
**NOTICE OF PUBLIC HEARING**

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G.C.S.D. Services - 209 / 962-7161

Fax - 209 / 962-4943

Fire Department - 209 / 962-7891

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18966 Ferretti Road P.O. Box 350 Groveland, CA 95321-0350

September 7, 2021

Pine Mountain Lake Association  
Joe Powell  
General Manager  
19228 Pine Mountain Lake  
Groveland, CA 95321

**Subject: Notice of Public Hearing for the Groveland Community Services District 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Powell,

Existing State law requires each urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) at least once every 5 years. The Groveland Community Services District (GCSGD) has prepared its Draft 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), and it is now available for public review.

The Board of Directors will conduct a public hearing to receive public comments and consider adoption of the Draft 2020 UWMP and WSCP on Tuesday, November 9, 2021, at 10:00 a.m. or as soon thereafter as the matter may be heard, at the Board Chambers, 18966 Ferretti Road, Groveland, California. Following the public hearing, the Board of Directors may adopt the Draft 2020 UWMP and WSCP with recommended modifications as a result of public input.

The Draft 2020 UWMP and WSCP is available for public review at District's Administration office and on the District's website. During the public hearing, the Board of Directors will hear and consider all comments. All interested persons are invited to attend and speak on this matter. Written comments can also be submitted up until the date of the public hearing to:

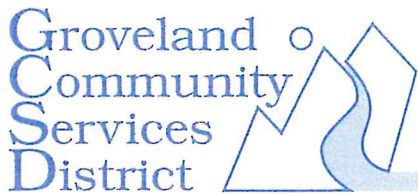
Peter Kampa  
General Manager  
Groveland Community Services District  
18966 Ferretti Rd  
Groveland, CA 95321  
e-mail: [pkampa@gcsd.org](mailto:pkampa@gcsd.org)

We invite your participation in this process.

Sincerely,

A handwritten signature in blue ink that reads "Rachel Pearlman".

Rachel Pearlman  
Board Secretary  
Groveland Community Services District



G.C.S.D. Services - 209 / 962-7161

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September 7, 2021

City of Sonora  
Rachel Kellogg  
Community Development Director  
94 N. Washington Street  
Sonora, CA 95370

**Subject: Notice of Public Hearing for the Groveland Community Services District 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Ms. Kellogg,

Existing State law requires each urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) at least once every 5 years. The Groveland Community Services District (GCSGD) has prepared its Draft 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), and it is now available for public review.

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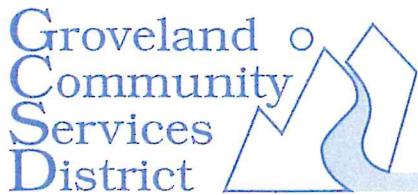
Peter Kampa  
General Manager  
Groveland Community Services District  
18966 Ferretti Rd  
Groveland, CA 95321  
e-mail: [pkampa@gcsd.org](mailto:pkampa@gcsd.org)

We invite your participation in this process.

Sincerely,

A handwritten signature in blue ink that reads "Rachel Pearlman".

Rachel Pearlman  
Board Secretary  
Groveland Community Services District



G.C.S.D. Services - 209 / 962-7161

Fax - 209 / 962-4943

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September 7, 2021

San Francisco Public Utilities Commission  
Michael Carlin  
General Manager  
525 Golden Gate Ave  
San Francisco, CA 94102

**Subject: Notice of Public Hearing for the Groveland Community Services District 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Carlin,

Existing State law requires each urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) at least once every 5 years. The Groveland Community Services District (GCSGD) has prepared its Draft 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), and it is now available for public review.

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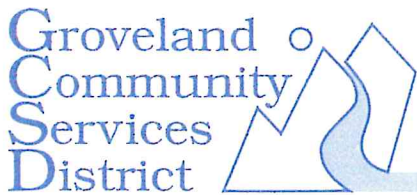
Peter Kampa  
General Manager  
Groveland Community Services District  
18966 Ferretti Rd  
Groveland, CA 95321  
e-mail: [pkampa@gcsd.org](mailto:pkampa@gcsd.org)

We invite your participation in this process.

Sincerely,

A handwritten signature in blue ink that reads "Rachel Pearlman".

Rachel Pearlman  
Board Secretary  
Groveland Community Services District



G.C.S.D. Services - 209 / 962-7161

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September 7, 2021

County of Tuolumne  
Quincy Yaley  
Community Development Department Director  
2 S. Green Street  
Sonora, CA 95370

**Subject: Notice of Public Hearing for the Groveland Community Services District 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Ms. Yaley,

Existing State law requires each urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) at least once every 5 years. The Groveland Community Services District (GCSGD) has prepared its Draft 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), and it is now available for public review.

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Peter Kampa  
General Manager  
Groveland Community Services District  
18966 Ferretti Rd  
Groveland, CA 95321  
e-mail: [pkampa@gcsd.org](mailto:pkampa@gcsd.org)

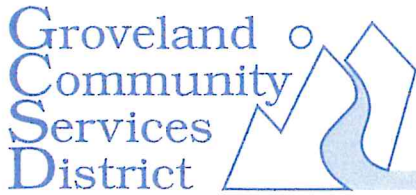
We invite your participation in this process.

Sincerely,

A handwritten signature in blue ink that reads "Rachel Pearlman".

Rachel Pearlman  
Board Secretary  
Groveland Community Services District





G.C.S.D. Services - 209 / 962-7161

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September 7, 2021

Turlock Irrigation District  
Michelle Reimers  
General Manager  
333 East Canal Drive  
P.O. Box 949  
Turlock, CA 95381

**Subject: Notice of Public Hearing for the Groveland Community Services District 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Ms. Reimers,

Existing State law requires each urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) at least once every 5 years. The Groveland Community Services District (GCSGD) has prepared its Draft 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), and it is now available for public review.

The Board of Directors will conduct a public hearing to receive public comments and consider adoption of the Draft 2020 UWMP and WSCP on Tuesday, November 9, 2021, at 10:00 a.m. or as soon thereafter as the matter may be heard, at the Board Chambers, 18966 Ferretti Road, Groveland, California. Following the public hearing, the Board of Directors may adopt the Draft 2020 UWMP and WSCP with recommended modifications as a result of public input.

The Draft 2020 UWMP and WSCP is available for public review at District's Administration office and on the District's website. During the public hearing, the Board of Directors will hear and consider all comments. All interested persons are invited to attend and speak on this matter. Written comments can also be submitted up until the date of the public hearing to:

Peter Kampa  
General Manager  
Groveland Community Services District  
18966 Ferretti Rd  
Groveland, CA 95321  
e-mail: [pkampa@gcsd.org](mailto:pkampa@gcsd.org)

We invite your participation in this process.

Sincerely,

A handwritten signature in blue ink that reads "Rachel Pearlman".

Rachel Pearlman  
Board Secretary  
Groveland Community Services District

**APPENDIX K**  
**PUBLICATION OF NOTICE OF PUBLIC HEARING**

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AFFP  
GROVELAND COMMUNITY SERVICES

**Affidavit of Publication**

STATE OF CALIFORNIA }  
COUNTY OF TUOLUMNE } SS

Bev Woodland, being duly sworn, says:

That she is Principal Clerk of the Union-Democrat, a daily newspaper of general circulation, published in Sonora, Tuolumne County, California; that the publication, a copy of which is attached hereto, was published in the said newspaper on the following dates:

September 02, 2021, September 09, 2021

That said newspaper was regularly issued and circulated on those dates.

SIGNED:



Principal Clerk

Subscribed to and sworn to me this 9th day of September 2021.



Bev Woodland, Principal Clerk, Tuolumne County, California

GROVELAND COMMUNITY SERVICES  
DISTRICT NOTICE OF PUBLIC HEARING

NOTICE IS HERBY GIVEN that the Board of Directors Groveland Community Services District (GCSD) will conduct a public hearing on Tuesday, November 9, 2021, at 10:00 a.m. or as soon thereafter as the matter may be heard, at the Board Chambers, 18966 Ferretti Road, Groveland, California, to consider the following:

GROVELAND COMMUNITY SERVICES  
DISTRICT 2020 URBAN WATER  
MANAGEMENT PLAN AND WATER  
SHORTAGE CONTINGENCY PLAN

The Board of Directors will conduct a public hearing to receive public comments and consider adoption of the Draft 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP). Following the public hearing, the Board of Directors may adopt the Draft 2020 UWMP and WSCP with recommended modifications as a result of public input.

The Draft 2020 UWMP documents the GCSD's plans to ensure adequate water supplies to meet existing and future demands under a range of water supply conditions, including water shortages. The Draft WSCP documents the GCSD's plans to manage and mitigate an actual water shortage condition, should one occur because of drought or other impacts on water supplies.

The Draft 2020 UWMP and WSCP is available for public review at District's Administration office and on the District's website. During the public hearing, the Board of Directors will hear and consider all comments. All interested persons are invited to attend and speak on this matter. Written comments can also be submitted up until the date of the public hearing to:

Peter Kampa  
General Manager  
Groveland Community Services District  
18966 Ferretti Rd  
Groveland, CA 95321  
e-mail: pkampa@gcsd.org

We invite your participation in this process.  
Publication dates: 9/2/21, 9/9/21  
The Union Democrat, Sonora, CA

00003642 00014975

Norma Chavez  
AM CONSULTING ENGINEERS  
5150 N SIXTH STREET, STE 124  
FRESNO, CA 93710

**GROVELAND COMMUNITY SERVICES  
DISTRICT NOTICE OF PUBLIC HEARING**

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DISTRICT 2020 URBAN WATER  
MANAGEMENT PLAN AND WATER  
SHORTAGE CONTINGENCY PLAN**

The Board of Directors will conduct a public hearing to receive public comments and consider adoption of the Draft 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP).

Following the public hearing, the Board of Directors may adopt the Draft 2020 UWMP and WSCP with recommended modifications as a result of public input.

The Draft 2020 UWMP documents the GCSD's plans to ensure adequate water supplies to meet existing and future demands under a range of water supply conditions, including water shortages. The Draft WSCP documents the GCSD's plans to manage and mitigate an actual water shortage condition, should one occur because of drought or other impacts on water supplies.

The Draft 2020 UWMP and WSCP is available for public review at District's Administration office and on the District's website. During the public hearing, the Board of Directors will hear and consider all comments. All interested persons are invited to attend and speak on this matter. Written comments can also be submitted up until the date of the public hearing to:

Peter Kampa  
General Manager  
Groveland Community Services District  
18966 Ferretti Rd  
Groveland, CA 95321  
e-mail: [pkampa@gcsd.org](mailto:pkampa@gcsd.org)

We invite your participation in this process.  
Publication dates: 9/2/21, 9/9/21  
The Union Democrat, Sonoma, CA

**APPENDIX L**  
**2020 UWMP AND WSCP ADOPTION RESOLUTION**

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**RESOLUTION 35-2021**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE GROVELAND COMMUNITY SERVICES DISTRICT ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN**

**WHEREAS**, the California Urban Water Management Planning Act ("Act") (California Water Code Sections 10610 et. seq.) requires urban water suppliers providing municipal water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to develop an Urban Water Management Plan; and

**WHEREAS**, the Act requires that an urban water management plan be updated every five years and submitted to the California Department of Water Resources by July, in the years ending in 1 and 6; and

**WHEREAS**, the Groveland Community Services District last updated its Urban Water Management Plan in January 2017; and

**WHEREAS**, the District's 2020 Urban Water Management Plan must be adopted, after public review and hearing, and filed with the California Department of Water Resources; and

**WHEREAS**, a Draft 2020 Urban Water Management Plan has been prepared and circulated for public review; and all comments received have been reviewed and considered; and, following publication of notices on September 2, 2021, and September 9, 2021, a properly noticed public hearing was held by the Board of Directors on November 9, 2021, prior to adoption of the Final Urban Water Management Plan, all in compliance with the requirements of the Act.


**NOW THEREFORE BE IT RESOLVED THAT THE BOARD OF DIRECTORS OF THE GROVELAND COMMUNITY SERVICES DISTRICT DOES HEREBY approve as follows:**

1. The 2020 Urban Water Management Plan is adopted.
2. The General Manager is authorized and directed to file the 2020 Urban Water Management Plan with the Department of Water Resources.

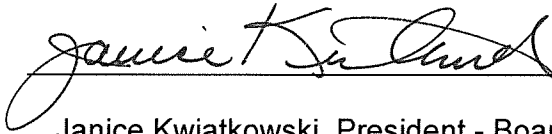
**WHEREFORE**, this Resolution is passed and adopted by the Board of Directors of the Groveland Community Services District on November 9, 2021, by the following vote:

AYES: Directors Kwiatkowski, Mora, Armstrong, Edwards and Swan  
NOES:  
ABSTAIN:  
ABSENT:

ATTEST:

  
\_\_\_\_\_

Rachel Pearlman, Board Secretary

  
\_\_\_\_\_

Janice Kwiatkowski, President - Board of Directors

**CERTIFICATE OF SECRETARY**

I, Rachel Pearlman, the duly appointed and acting Secretary of the Board of Directors of the Groveland Community Services District, do hereby declare that the foregoing Resolution was duly passed and adopted at a Regular Meeting of the Board of Directors of the Groveland Community Services District, duly called and held on November 9, 2021.

DATED: 11.9.2021

## RESOLUTION 36-2021

### A RESOLUTION OF THE BOARD OF DIRECTORS OF THE GROVELAND COMMUNITY SERVICES DISTRICT ADOPTING THE 2020 WATER SHORTAGE CONTINGENCY PLAN

**WHEREAS**, the California Urban Water Management Planning Act ("Act") (California Water Code Sections 10610 et. seq.) requires urban water suppliers providing municipal water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to develop an Urban Water Management Plan and Water Shortage Contingency Plan; and

**WHEREAS**, the District's 2020 Water Shortage Contingency Plan must be adopted, after public review and hearing, and filed with the California Department of Water Resources; and

**WHEREAS**, a Draft 2020 Water Shortage Contingency Plan has been prepared and circulated for public review; and all comments received have been reviewed and considered; and, following publication of notices on September 2, 2021, and September 9, 2021, a properly noticed public hearing was held by the Board of Directors on November 9, 2021, prior to adoption of the Final Urban Water Management Plan, all in compliance with the requirements of the Act.

NOW THEREFORE BE IT RESOLVED THAT THE BOARD OF DIRECTORS OF THE GROVELAND COMMUNITY SERVICES DISTRICT DOES HEREBY approve as follows:

1. The 2020 Water Shortage Contingency Plan is adopted.
2. The General Manager is authorized and directed to file the 2020 Water Shortage Contingency Plan with the Department of Water Resources.

**WHEREFORE**, this Resolution is passed and adopted by the Board of Directors of the Groveland Community Services District on November 9, 2021, by the following vote:

AYES: Directors Kwiatkowski, Mora, Armstrong, Edwards and Swan

NOES:

ABSTAIN:

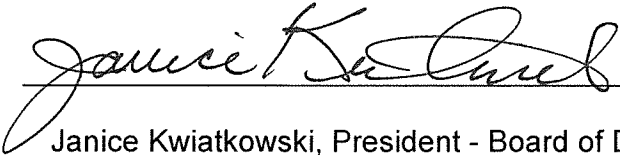
ABSENT:



ATTEST:

  
\_\_\_\_\_

Rachel Pearlman, Board Secretary

  
\_\_\_\_\_

Janice Kwiatkowski, President - Board of Directors

**CERTIFICATE OF SECRETARY**

I, Rachel Pearlman, the duly appointed and acting Secretary of the Board of Directors of the Groveland Community Services District, do hereby declare that the foregoing Resolution was duly passed and adopted at a Regular Meeting of the Board of Directors of the Groveland Community Services District, duly called and held on November 9, 2021.

DATED: 11.9.2021

**APPENDIX M**  
**2020 UWMP CHECKLIST**

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2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Chapter 1, pg. 8-12
Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Lay Description, pg. 1-7
Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.2
Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5
Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.5
Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Sections 2.5.1 & 6.4
Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Not Applicable
Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Chapter 3, pg. 17-21
Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.4
Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.5.1, Table 3-3
Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.5.2
Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.5.1
Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.6
Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.3
Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.3.3
Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws.	System Water Use	Section 4.3.6
Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.3.6
Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.3.3
Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.4
Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.5
Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Section 5.6
Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.7
Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Not Applicable
Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.7.1
Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7
Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Section 5.7.2
Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Sections 6.2, 6.4 & 7.2

Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, <i>including changes in supply due to climate change.</i>	System Supplies	Section 6.11
Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Not Applicable
Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.9
Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.10
Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.3
Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Not Applicable
Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Not Applicable
Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Not Applicable
Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Not Applicable
Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Not Applicable
Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Not Applicable
Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.4
Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.6
Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.6
Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.6.4
Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.6.4
Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.6.5
Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.6
Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.7
Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.6
Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.9
Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.12
Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.2
Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.2.4
Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.2
Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.3
Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.3

Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.3
Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.3
Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.3
Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Chapter 7 pg. 61-81
Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Section 8.2
Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Section 8.10
Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Section 8.3
Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Section 8.3
Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Section 8.4
Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Section 8.4, Table 8-1
Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Section 8.4, Table 8-1
Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Section 8.5
Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Section 8.5
Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Section 8.5
Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Section 8.5
Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Section 8.5.6
Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Section 8.6
Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Section 8.6
Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Section 8.7
Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Section 8.8
Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Section 8.8
Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Section 8.8
Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 8.9
Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 8.9
Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Section 8.9
Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Section 8.10

Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Section 8.12
Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4
Section 8.12	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Section 10.4
Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Section 9.2
Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Section 9.3
Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Chapter 10 pg. 97-91
Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.2.1
Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.4
Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2 - 10.4, Appendices J & K
Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2.1
Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Appendix L
Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4
Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4
Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.4
Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	Section 10.6
Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.7.2