City of Madera

Urban Water Management Plan 2020 Update

September 2022

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City of Madera

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Abbreviations

AB ..... State Assembly Bill
AF ..... acre-feet
AWWA ..... American Water Works Association
California Water Service ..... Cal Water
CIMIS ..... California Irrigation Management Information System
CMGSA ..... City of Madera Groundwater Sustainability Agency
CVP ..... Central Valley Project
CWC ..... California Water Code
DMM ..... Demand Management Measures
DOF ..... Department of Finance
DRA ..... Drought Risk Assessment
DWR ..... Department of Water Resources
ENSO ..... El Niño Southern Oscillation
ETo ..... evapotranspiration
GAC ..... granular activated carbon
GMP ..... Groundwater Management Plan
gpcd ..... gallons per capita per day
gpd ..... gallons per day
GSP ..... Groundwater Sustainability Plan
kWh ..... kilowatt hours
MG ..... million gallons
mg/L ..... milligrams per liter
MCL ..... Maximum Contaminant Level
MGD ..... million gallons per day
MID ..... Madera Irrigation District
MWELO ..... Model Water Efficient Landscape Ordinance
RUWMP ..... Regional Urban Water Management Plan
SB ..... State Senate Bill
SBx7-7 ..... Water Conservation Act of 2009
SGMA ..... Sustainable Groundwater Management Act of 2014

TCP ..... 1,2,3 Trichloropropane
TDS ..... Total Dissolved Solids
UDB ..... Urban Development Boundary
UWMP ..... Urban Water Management Plan
UWMP Guidebook ..... 2020 Urban Water Management Plan Guidebook for Urban Water Suppliers
UWMPA ..... Urban Water Management Plan Act
WSCP ..... Water Shortage Contingency Plan
WSMP ..... City of Madera Water System Master Plan
WUE ..... Water Use Efficiency
WWTF ..... Wastewater Treatment Facility

Lay Description

Legal Requirements:

CWC §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.*

The City of Madera has prepared this 2020 Urban Water Management Plan (UWMP), encompassing its entire service area. The UWMP discusses the water system, system supplies and demands, compliance with legislation requiring reduced demands by 20 percent. The UWMP spans the years from 2020 through 2040 and serves as an update to the UWMP adopted in 2017 for the 2015 – 2035 timeframe.

The City's service area covers all users within the City limits. Three unincorporated areas are found to the north, south and east of the City, respectively, including Madera Acres, Parkwood, and Parksdale. None of these areas receive City water; however, portions of Parkwood are on the City sewer system. The combined service area includes an estimated population of 65,526 in 2020 with a projection to 81,552 individuals by 2040 (assumed 1.1 percent annual growth rate).

The City provides water supplies to the customer base through multiple groundwater wells located throughout the City; the system uses groundwater as its sole water supply source. In the past, the City has purchased small quantities of surface water from Madera Irrigation District for use as groundwater recharge in basins around the service area. Based on recent water audits, the City has not purchased or imported water since at least 2017.

The State of California set a goal for all cities to reduce their water use by 20% and to achieve this goal by the year 2020. To reach this goal, the City needed to limit water use to 196 gallons per day for each person. In 2020, the City met this goal with a per person use of 119 gallons per day and will continue water conservation programs to keep meeting this goal in the future.

The City has water conservation programs that can be implemented in the event of drought or other water supply issues. The City is also prepared to respond to a water supply interruption from an emergency. These measures are documented in the Water Shortage Contingency Plan, which is included in this document as an appendix, but is a separate plan from this UWMP. The City will typically not experience water shortages unless there is a catastrophic interruption of supply.

Executive Summary

The California Water Code requires urban water suppliers within the state to prepare and adopt Urban Water Management Plans (UWMPs) for submission to the California Department of Water Resources (DWR). The UWMPs, which must be filed every five years, must satisfy the requirements of the Urban Water Management Planning Act (UWMPA) of 1983 including amendments that have been made to the Act and other applicable regulations. 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, as set forth in the 2020 Urban Water Management Plan Guidebook for Urban Water Suppliers (UWMP Guidebook) established by the DWR (DWR, 2021), constitutes the City of Madera's (City) 2020 UWMP.

The UWMP is organized into ten Sections, including: Section 1 – Introduction and Overview; Section 2 – Plan Preparation; Section 3 – System Description; Section 4 – System Demands; Section 5 – SB X-7 Baselines, Targets, and Compliance; Section 6 – System Supplies; Section 7 – Water Service Reliability; Section 8 – Water Shortage Contingency Planning; Section 9 – Demand Management Measures; and Section 10 – Plan Adoption, Submittal, and Implementation.

System Description

The City is the only municipal water purveyor within the City limits and provides service to 65,526 City residents. The graphic to the right shows the anticipated growth within the service area, including a 1.1% growth rate for the City.

The existing land uses within the city limits include 5,362 acres of residential, 1,392 acres of commercial and office space, 1,003 acres of industrial, 1,127 acres of Open Space and Resource Conservation, and 1,472 acres of Public facilities.

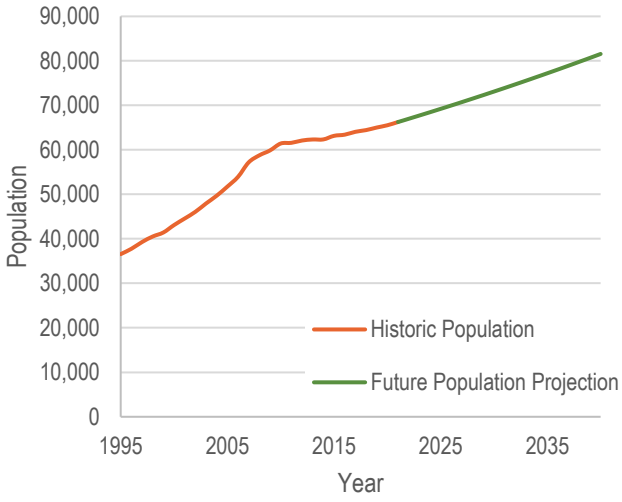

Figure ES-1: Historic and Projected Population

System Demands

The City provides water through five customer classes, including single-family, multi-family, commercial/institutional, industrial, and landscape. The total water delivered in the past twenty years has decreased, while the service population has increased by more than 50 percent, indicating the per capita demands have decreased over the same period, as seen in **Table ES-1**.

Table ES-1: Historic Water Production

Year	Total Annual Water Production	Population	Per Capita Consumption
2000	11,834	43,089	245
2001	11,210	44,565	225
2002	11,868	46,066	230
2003	12,473	47,939	232
2004	12,886	49,691	232
2005	12,818	51,735	221
2006	13,299	53,928	220
2007	13,725	57,181	214
2008	13,763	58,767	209
2009	13,114	59,868	196
2010	11,742	61,416	171
2011	11,395	61,574	165
2012	11,742	62,096	169
2013	11,327	62,330	162
2014	10,635	62,342	152
2015	9,313	63,147	132
2016	9,203	63,407	130
2017	9,088	64,052	127
2018	8,393	64,436	116
2019	8,361	65,008	115
2020	8,754	65,526	119

Notes:
Water Production units: acre-feet (AF)
Per Capita Consumption units: gallons per capita per day (gpcd)

The total demands for 2020 and the projected demands for the next twenty years can be seen in **Table ES-2**.

Table ES-2: Current and Projected Water Use

Use Type	Current Water Use 2020 (AF)	Projected Water Use (AF)			
		2025	2030	2035	2040
Single Family	5,214	8,450	8,145	8,603	9,087
Multi-Family	1,553	2,517	2,426	2,563	2,707
Commercial/Institutional	1,282	2,225	2,350	2,482	2,622
Industrial	80	138	146	154	163
Landscape	550	955	1,008	1,065	1,125
Other	0	0	0	0	0
Water Loss	75	585	618	653	689
Total	**8,754**	**14,870**	**14,694**	**15,520**	**16,392**

The projected water use is based on a blend of the 2020 Water Use target of 196 gallons per capita per day (gpcd) and a reduced residential target of 183 and 167 gpcd for years 2025 and 2030 and beyond, respectively. This reduced target reflects the anticipated indoor residential water use standards discussed in Assembly Bill 1668 and Senate Bill 606.

SB X7-7 Compliance

The City's 2020 per capita water use goal was set in the 2015 UWMP as 196 gpcd. As discussed in the 2020 UWMP Guidebook, the City does not meet any criteria which would necessitate updating the target; therefore, 196 gpcd remains the 2020 water use target. With a water use of 119 gpcd, the City has met the target and achieved SB X7-7 compliance. As shown in the following figure, the City's per capita water use remains well below the 196 gpcd target.

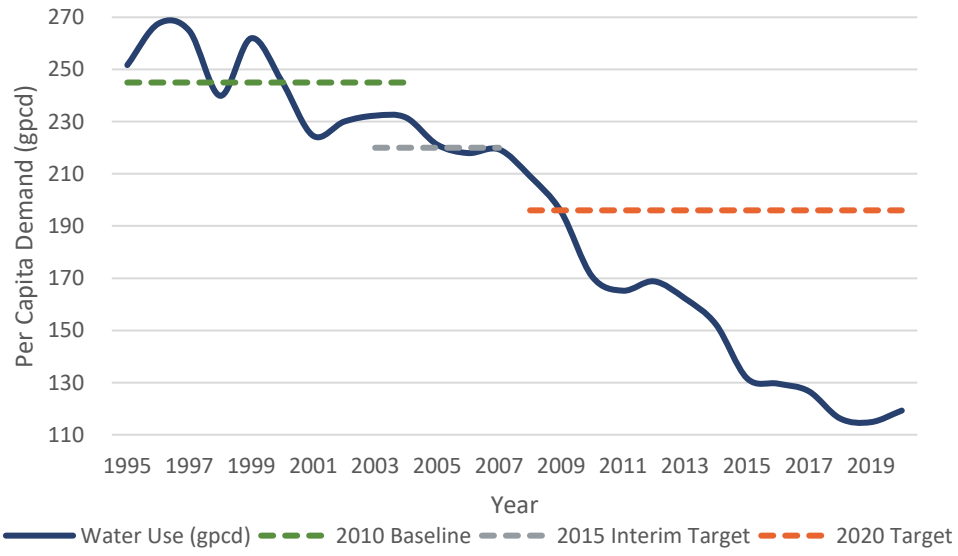

Figure ES-2: SB X7-7 Compliance

System Supplies

The City's groundwater supplies are extracted from the Madera Subbasin, an unadjudicated basin underlying the area. While the basin does not have legal limitations on groundwater pumping, the City is a participant in the City of Madera Groundwater Sustainability Agency (CMGSA) and a party to the Madera Subbasin Joint Groundwater Sustainability Plan (MJGSP)[1]. The CMGSA is working cooperatively with the six (6) other GSAs in the Madera Subbasin to manage the groundwater aquifer and reach sustainability by 2040. As part of those efforts, the agencies have agreed to manage groundwater extraction in a way that does not cause undesirable results in the aquifer.

Historically, the City's water supply has been 100 percent from groundwater. In the past, the City has purchased small quantities of surface water from Madera Irrigation District for recharge purposes, not use within the drinking water system.

Water Supply Reliability

A comparison of the City's supplies and projected demands is used to evaluate the water supply reliability. The supply shown in the following tables is entirely groundwater and does not represent the total supply available in the aquifer but rather the supply utilized by the City to meet its customers' demands.

The City water supply has historically been very consistent, due in large part to the reliability of the groundwater aquifer, and it is anticipated this will continue into the future. However, as SGMA is further implemented, it is possible that there will be further restrictions on groundwater pumping especially in critical dry and multiple dry years.

This comparison is completed for "normal" years when no drought conditions are present.

Table ES-3: Normal Year Supply and Demand Comparison

Condition	2025	2030	2035	2040
Supply Totals	14,870	14,694	15,520	16,392
Demand Totals	14,870	14,694	15,520	16,392
Difference	**0**	**0**	**0**	**0**

Units: AF

The single dry water year will be largely unaffected by dry weather conditions, due to the City's reliance on groundwater. This projection does not take into account possible state-wide mandates for conservation beyond that required by SBx7-7, groundwater pumping restrictions that may arise from SGMA, or any possible future adjudication of the basin.

[1] The MJGSP was prepared by four (4) of the seven (7) GSAs within the subbasin, including the CMGSA.

Table ES-4: Single-Dry Year Supply and Demand Comparison (DWR Submittal Table 7-3)

Condition	2025	2030	2035	2040
Supply Totals	14,870	14,694	15,520	16,392
Demand Totals	14,870	14,694	15,520	16,392
Difference	**0**	**0**	**0**	**0**

Units: AF

It is anticipated State-wide conservation mandates would be required during a prolonged drought; however, the magnitude of those mandates is unknown, and supplies would be available from the aquifer to meet the demands, even if demands were reduced based on mandated conservation requirements.

Table ES-5: Multiple-Dry Year Supply and Demand Comparison (DWR Submittal Table 7-4)

Condition		2025	2030	2035	2040
First Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Second Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Third Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**

Units: AF

As the final portion of Section 7, the City prepared a Drought Risk Assessment, evaluating the preparedness of the City to contend with a drought immediately within the next five years. Using the 2012-2016 drought as a model, the supplies were assumed to be reduced and conservation measures implemented to meet the reduction in usable supplies.

Table ES-6: Five-Year Drought Risk Assessment

Year	Without WSCP Actions			Planned WSCP Actions			
	Total Water Use	Total Supplies	Surplus/Shortfall w/o WSCP Action	Supply augmentation benefit	Use reduction savings benefit	Revised Surplus/ (shortfall)	Resulting % Use Reduction from WSCP action
2021	9,977	9,977	(594)	0	1,037	1,037	10%
2022	11,201	11,201	(338)	0	2,240	2,240	20%
2023	12,424	12,424	(822)	0	2,485	2,485	20%
2024	13,647	13,647	(1,670)	0	3,412	3,412	25%
2025	14,870	14,870	(1,667)	0	4,461	4,461	30%
Units: AF							

Demand Management Measures

The final substantive component of the UWMP addresses the City's efforts to implement Demand Management Measures (DMM), including water waste prevention, implementing water metering programs, conservation pricing, public education, assessing and managing system losses, and other measures. The City implements all recommended DMMs and continues to monitor their effectiveness and evaluate introduction of new measures in the "other" category. Implementation of the DMMs helps the City respond to water conservation needs.

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1 Introduction

1.1 Background and Purpose

The California Water Code requires urban water suppliers within the state to prepare and adopt Urban Water Management Plans (UWMPs) for submission to the California Department of Water Resources (DWR). The UWMPs, which must be filed every five years, must satisfy the requirements of the Urban Water Management Planning Act (UWMPA) of 1983 including amendments that have been made to the Act and other applicable regulations. 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, and as set forth in the 2020 Urban Water Management Plan Guidebook for Urban Water Suppliers (DWR, 2021) established by the DWR (UWMP Guidebook), constitutes the City of Madera (City) 2020 UWMP.

This 2020 UWMP was prepared in compliance with the UWMPA and the Water Conservation Bill of 2009 (Senate Bill [SB] x7-7) by Provost & Pritchard Consulting Group (P&P) and the City. Contact information for the City and P&P is included at the beginning of this document.

1.2 Previous Urban Water Management Plan

The City previously prepared an UWMP in 2015, which was approved and adopted by the City Council on April 5, 2017. Following adoption, the 2015 UWMP was submitted to and approved by DWR.

This 2020 UWMP serves as an update to the 2015 UWMP and complies with all new UWMP requirements and regulations.

1.3 Urban Water Management Planning and the California Water Code

This section summarizes the California Water Code (CWC) sections that are applicable to UWMPs.

1.3.1 Urban Water Management Planning Act of 1983

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

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. This is merely a guideline and not a requirement of the UWMPA. Therefore, the use of a 25-year planning horizon as opposed to a 20-year planning horizon is left up to the discretion of the agency. The City has opted to use a 20-year planning horizon for the purposes of this UWMP.

Other amendments require that UWMPs include provisions for recycled water use, demand management measures, and a water shortage contingency plan. The UWMPA requires inclusion of a water shortage contingency plan, which meets the specifications, set forth therein. Recycled water was added into 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 water shortage contingency plan 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:

- ***Assembly Bill (AB) 1668 (Friedman, 2018), and Senate Bill (SB) 606 (Hertzberg, 2018)****: These two bills amended existing law to provide expanded and new authorities and requirements to enable permanent changes and actions for those purposes, improving the state's water future for generations to come. SB 606 and AB 1668 provides complementary authorities and requirements that affect water conservation and drought planning for urban water suppliers, agricultural water suppliers, and small water suppliers and rural communities.*
- ***AB 1465 (Hill, 2009):*** *Requires water suppliers to describe opportunities related to recycled water use and stormwater recapture to offset potable water use.*
- ***AB 1420 (Laird, 2007):*** *Requires implementation of demand management measures (DMMs)/best management practices (BMPs) and meeting the 20x2020 targets to qualify for water management grants or loans.*
- ***SB 1087 (Florez, 2005):*** *Requires water suppliers to report single-family residential (SFR) and multifamily residential (MFR) projected water use for lower income areas separately.*
- ***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.*
- ***AB 105 (Wiggins, 2004):*** *Requires urban water suppliers to submit their UWMPs to the California State Library.*
- ***Amendments SB 610 (Costa, 2001), and AB 901 (Daucher, 2001):*** *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).*

1.3.2 Water Conservation Act of 2009 (SBx7-7)

This bill requires the State to achieve a 20-percent reduction in per capita water use by 2020 (State of California, 2010). Retail water suppliers are required to comply with the water conservation requirements in SBx7-7 in order to be eligible for State water grants or loans. Each retail water agency shall establish water use targets and track progress towards decreasing daily per capita water use.

1.3.3 Applicable Changes to the Water Code since 2015 UWMP

The applicable changes to the CWC since the completion of the City's 2015 UWMP are summarized in **Table 1-1**.

Table 1-1: Applicable Changes to the Water Code Since 2015

Topic	CWC Section	Legislative Bill	Summary
Water Shortage Contingency Plan	10620(d)(2) 10632 *10640(b)*	SB 606	*Requires each urban water supplier to prepare a water shortage contingency plan. A water shortage contingency plan must include six levels, including 10, 20, 30, 40, 50 and greater than 50 percent supply shortages. The water shortage contingency plan must be provided to the supplier's customers within 30 days of adoption.*
Submittal Date	*10621(f)*	SB 606	*Requires each urban water supplier to submit its 2020 plan to the Department of Water Resources by July 1, 2021.*
UWMP Contents	*10630.5*	*SB 606*	*Requires each plan include a simple lay description of its water supply availability, projected needs, and reliability.*
UWMP Contents	*10631(a)*	*SB 606*	Requires each plan to include the following new or revised items discussing: • Current and projected land uses within the service area; • Supply availability during normal and single dry years, and a five-year drought; • Conjunctive use, if applicable, and how new supplies will be developed; and • The current groundwater sustainability plan for the groundwater basin if groundwater is a source supply.
Energy Usage Reporting	*16031.2(a)*	*SB 606*	*Changes requirements for reporting energy usage for extracting and delivering water from optional to required.*

Topic	CWC Section	Legislative Bill	Summary
Seismic Risk Assessment and Mitigation Plan	*10632.5*	*SB 664*	*Requires urban water suppliers to provide a seismic risk assessment and mitigation plan as part of their UWMP update or approved equal plan.*
Drought Risk Assessment	*10635.5(b)*	*SB 606*	*Requires urban water suppliers to provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.*
Plan Availability	*10645*	*SB 606*	*Requires urban water suppliers to make the UWMP and water shortage contingency plan available to the public for review within 30 days of filing the plan(s) with the State.*

1.4 Water Management Planning Efforts

The City is committed to provide a reliable and high-quality water supply to its customers. In order to ensure that the City will be able to continue to reliably serve the residents of Madera in the future, the City has conducted/participated in several important planning efforts that relate to water supply planning and are related to the UWMP. Some of the most critical water planning efforts are summarized below:

- ***City of Madera General Plan:*** *The City prepared and updated their General Plan in 2009 which served as a roadmap for improving the City by the year 2025 (Madera & PMC, 2009). This plan focuses on different elements of land use, circulation, housing, conservation, open space, noise and safety. One of the goals identified in this report was to ensure continued water supply to meet City water demands through innovative reclamation, conservation, and education on water use.*
- ***Water Master Plan Update:*** *In 2014, Akel Engineering prepared the City of Madera Water System Master Plan (WSMP) (Akel Engineering Group, Inc., 2014). The Master Plan included the following:*
    - *Summary of the City's existing domestic water system facilities*
    - *Documentation of planning growth assumptions and known future developments*
    - *Projections of future domestic water demands*
    - *Evaluation of the domestic water facilities needed to meet existing and projected demand requirements and fire flows*
    - *Evaluation of the existing groundwater conditions*
    - *Recommendations for a Capital Improvement Program (CIP) including an opinion of probable cost*

The 2014 WSMP used a different methodology for estimating current and future per capita demands than the 2010 UWMP and stated that demand estimates superseded those in the 2010 UWMP. This report uses data from the 2014 WSMP, as well as recent data from the City and California Department of Finance. As a result, the per capita demand analysis in this UWMP supersedes the analysis in the WSMP.

The WSMP includes a proposed $148 million CIP through the year 2050. The CIP is mentioned in this UWMP and will be the blueprint for future water system improvements in the City of Madera. The WSMP estimated future population growth of 3.5% annually, but this estimate has been revised down to 2% herein, so the proposed CIP may be implemented at a slower pace than presented in the CIP.

The WSMP and UWMP overlap in several areas, and some of the information in this UWMP was obtained from the WSMP.

- ***Regional Water Management Plan:*** *The City of Madera is a member of the Regional Water Management Group (RWMG). An updated Integrated Regional Water Management Plan (IRWMP) was prepared in December 2014 by the RWMG (Provost & Pritchard Consulting Group, 2015). The plan identifies priority water resources projects and programs.*
- ***Groundwater Sustainability Plan:*** *The City of Madera Groundwater Sustainability Agency (CMGSA) along with three other Groundwater Sustainability Agencies (GSAs) prepared the Madera Subbasin Joint Groundwater Sustainability Plan (MJGSP). The MJGSP was prepared in response to the Sustainable Groundwater Management Act of 2014, which is codified in California Water Code Section 10720 et seq. The legislation created a statutory framework for groundwater management in California that can be sustained during the planning and implementation horizon without causing undesirable results. SGMA requires governments and water agencies of critically over drafted basins to reach sustainability by 2040.*

1.5 UWMP Organization

This report is organized according to the recommended format provided in the DWR's 2020 UWMP Guidebook. The UWMP contains ten sections, followed by appendices that provide supporting documentation for the information presented in the report. The sections are outlined below:

- ***Lay Description/Executive Summary:*** *This section includes a lay description of the fundamental determinations of the UWMP regarding water service reliability, challenges ahead, and strategies for managing reliability risks.*
- ***Section 1 – Introduction:*** *This section provides background information for the 2020 UWMP and explains why the plan is needed.*
- ***Section 2 – Plan Preparation:*** *This section includes information on the development of the UWMP and efforts in coordination and outreach.*
- ***Section 3 – System Description:*** *This section describes the service area, population, and climate affecting the supplier's water management planning. This section also presents an overview of the City's water distribution system.*

- ***Section 4 – System Demands:*** *This section describes and quantifies the current and projected water uses within the City's service area. This section will also address climate change as it relates to system water use.*
- ***Section 5 – SBx7-7 Baselines, Targets, and Compliance:*** *This section describes the methods for calculating baseline and target consumption. It also includes a description of the City's efforts to meet the 2020 water use target.*
- ***Section 6 – System Supplies:*** *This section describes the current and projected sources of water available to the City. A description of potential recycled water use, supply availability and associated energy use is also included in this section. This section also addresses climate change as it relates to system supplies.*
- ***Section 7 – Water Supply Reliability:*** *This section describes the reliability of the City's current supply and evaluates the reliability 20 years out, including normal, single-dry years, and multiple dry years. This section also provides a five-year reliability analysis and drought risk assessment and addresses climate change as it relates to water supply reliability.*
- ***Section 8 – Water Shortage Contingency Planning:*** *This section references the City's staged plan for dealing with water shortages, including a catastrophic supply interruption.*
- ***Section 9 – Demand Management Measures:*** *This section describes the City's efforts to promote conservation, reduce water demand, and describes the City's demand management measures.*
- ***Section 10 – Plan Adoption, Submittal, and Implementation:*** *This section describes the steps taken to adopt and submit the City's UWMP and make it publicly available. This section will also describe the City's plan to implement the UWMP.*

2 Plan Preparation

This section presents information on the development of the 2020 UWMP and efforts in coordination and outreach.

2.1 Basis for Preparing a Plan

Legal Requirements:

CWC §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.*

CWC §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 §10621(a) *Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero, except as provided in subdivision (d).*

CWC §10621 (d) *Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.*

CWC §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.*

CWC §10608.52(a) *The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.*

CWC §10608.52 (b) *At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24… The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.*

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.*

The CWC defines an urban water supplier as "a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes". **Table 2-1** documents the number of municipal connections and the volume of water supplied in 2020. The City is considered an urban retail water supplier.

Table 2-1: Public Water System (Submittal Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 (AF)
2010002	Madera, City of	13,913	8,755

Notes:

Municipal connections include all connections, metered or unmetered, including construction, recycled, and emergency water service connections.

Volume of Water Supplied includes all water into the system, without correction for losses.

2.2 Individual Planning and Compliance

Water agencies are given the option to develop UWMPs individually or collectively as a regional group. While efforts to prepare the UWMP were coordinated with appropriate agencies, this UWMP was developed for the City service area only, and the City is not participating in a Regional UWMP (RUWMP) as shown in **Table 2-2**.

Table 2-2: Plan Identification (Submittal Table 2-2)

Select Only One	Type of Plan	Name of RUWMP or Regional Alliance (if applicable)
☑	Individual UWMP	
	☐ Water Supplier is also a member of a RUWMP	N/A
	☐ Water Supplier is also a member of a Regional Alliance	N/A
☐	Regional Urban Water Management Plan (RUWMP)	N/A

2.3 Fiscal or Calendar Year and Units of Measure

Legal Requirements:

CWC §1608.20(a)(1) *Urban retail water suppliers…may determine the targets on a fiscal year or calendar year basis.*

The City is reporting on a calendar year basis and therefore the 2020 data includes the months of January to December 2020. Additionally, the data presented in this UWMP is presented in the units of acre-feet (AF). **Table 2-3** indicates the City's type of reporting year, and the units of measure for reporting water volumes throughout the 2020 UWMP.

Table 2-3: Agency Identification (Submittal Table 2-3)

Type of Plan	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in Calendar Years
☐	UWMP Tables are in Fiscal Years
Units of Measure used in UWMP	
Unit	AF

2.4 Coordination and Outreach

The UWMPA requires that the UWMP identify the water agency's coordination with appropriate nearby agencies.

Legal Requirements:

CWC §10631(j) *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 (c). 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 (c).*

CWC §10620(d)(2) *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 §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 the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of 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 hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.*

CWC §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.*

The City's 2020 UWMP is intended to address those aspects of the UWMPA, which are under the control of the City, specifically water supply and water use. While preparing the 2020 UWMP, the City coordinated its efforts with relevant agencies to ensure that the data and issues are presented accurately.

2.4.1 Wholesale and Retail Coordination

The City does not receive wholesale water, nor does it plan to in the future (**Table 2-4**).

Table 2-4: Water Supplier Information Exchange (Submittal Table 2-4)

The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC §10631
Wholesale Water Supplier Name
N/A

2.4.2 Coordination with Other Agencies and the Community

The City solicited participation from other agencies and organizations for the preparation of the 2020 UWMP. **Table 2-5** summarizes how the UWMP preparation was coordinated.

Table 2-5: Coordination with Appropriate Agencies

Coordinating Agencies	Sent a Notice of Intention to Adopt	Participated in Developing the Plan	Sent a Copy of the Draft Plan	Commented on the Draft	Attended Public Meetings	Contacted for Assistance
County of Madera	☒	☐	☒	☐	☐	☐
Madera Irrigation District	☒	☐	☒	☐	☐	☐

2.4.3 Notice to Cities and Counties

The City provided formal written notification to the County of Madera and Madera Irrigation District (MID) that the City's UWMP was being updated. In accordance with the UWMPA, this notification was provided at least 60 days prior to the public hearing of the plan. Electronic copies of the final UWMP will be provided to these agencies no later than 30 days after its submission to the DWR. Appendix A contains copies of the outreach documents.

3 System Description

The UWMPA requires that the UWMP include a description of the water purveyor's service area and various aspects of the area served including climate, population, and other demographic factors.

3.1 General Description

Legal Requirements:

> ***CWC § 10631(a)*** *[A plan shall be adopted in accordance with this chapter that shall do all of the following:] Describe the service area of the supplier, including current and projected population, climate, and other 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 City of Madera (City), incorporated in 1907, is located along Highway 99 near the middle of the San Joaquin Valley in Central California. The City covers 15.8 square miles or about 10,100 acres, as shown in **Figure 3-1**.

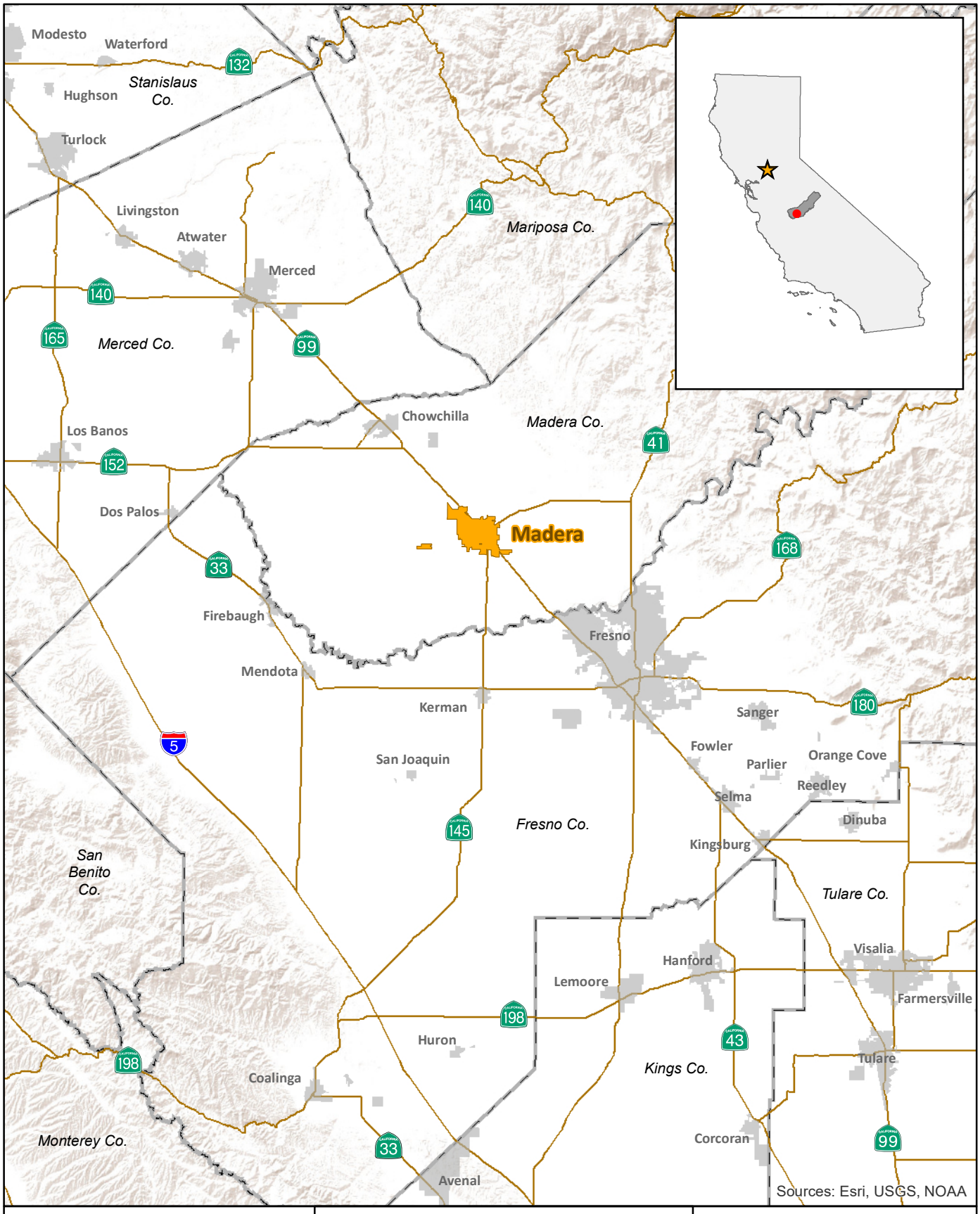
The City of Madera is the largest city in Madera County and serves as the County seat. The City was laid out in 1876 at the end of a lumber flume, which delivered timber from the Sierra Nevada Mountains to sawmills near the railroads. The City utilizes a Council and Administrator form of government. Six City Council members and a separately elected Mayor address the legislative needs of the City. The City Administrator is appointed by the City Council to administer the overall city organization. Madera is a full-service city, operating its own water and wastewater systems, and hosts a full range of community-based programs and services. Strategic planning in the City is driven by Vision Madera 2025, a community-based visioning program completed in 2006, and by the City's Comprehensive General Plan.

The City lies within the San Joaquin Valley and consists of mostly flat topography. The foothills of the Sierra Nevada Mountains begin about 15 miles east of the City. The foothills of the Coastal Mountain Range are about 45 miles west of the City. As shown in **Figure 3-1**, the Fresno River flows through the City from the east. The river is dry for much of the year since the flow is dependent on water releases from upstream water impoundments.

3.2 Service Area Boundary

The City provides water supply to all users within the City limits, as shown on **Figure 3-2.** Three unincorporated areas are found to the north, south and east of the City, respectively, including Madera Acres, Parkwood, and Parksdale. None of these areas receive City water; however, portions of Parkwood are on the City sewer system.

The island of City of Madera property west of the main portion of the City and outside of the City's sphere of influence, as shown on **Figure 3-2**, is the City's wastewater treatment facility.



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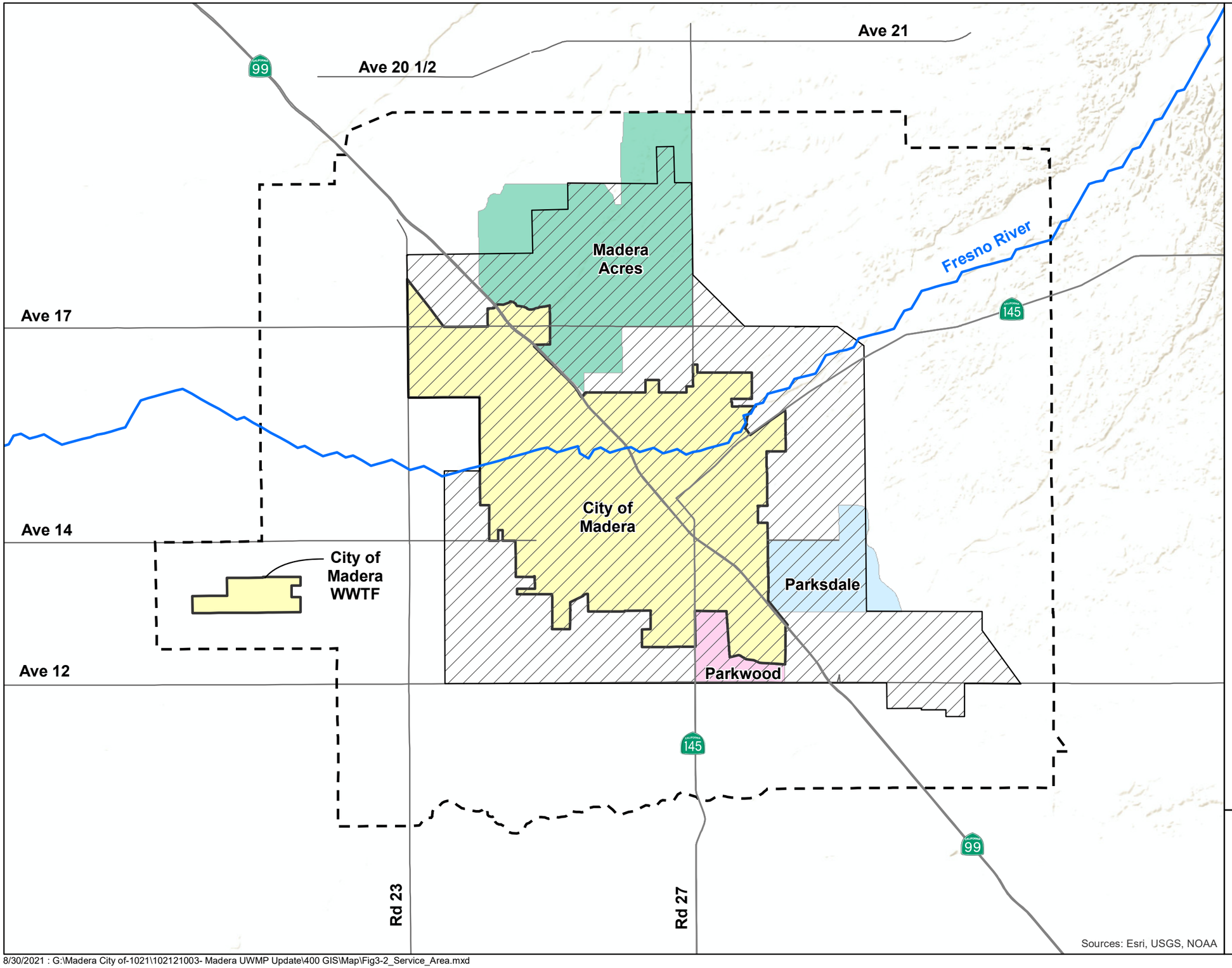


Legend

- Fresno River
- General Plan Boundary
- City of Madera / Service Area Approx. 10,107 acres
- City of Madera Sphere of Influence

Figure 3-2
Service Area

City of Madera
2020 Urban Water Management Plan

EST. 1968
PROVOST & PRITCHARD
CONSULTING GROUP
An Employee Owned Company

N
0 0.5 1
Miles

8/30/2021 : G:\Madera City of-1021\102121003- Madera UWMP Update\400 GIS\Map\Fig3-2_Service_Area.mxd

3.3 Service Area Climate

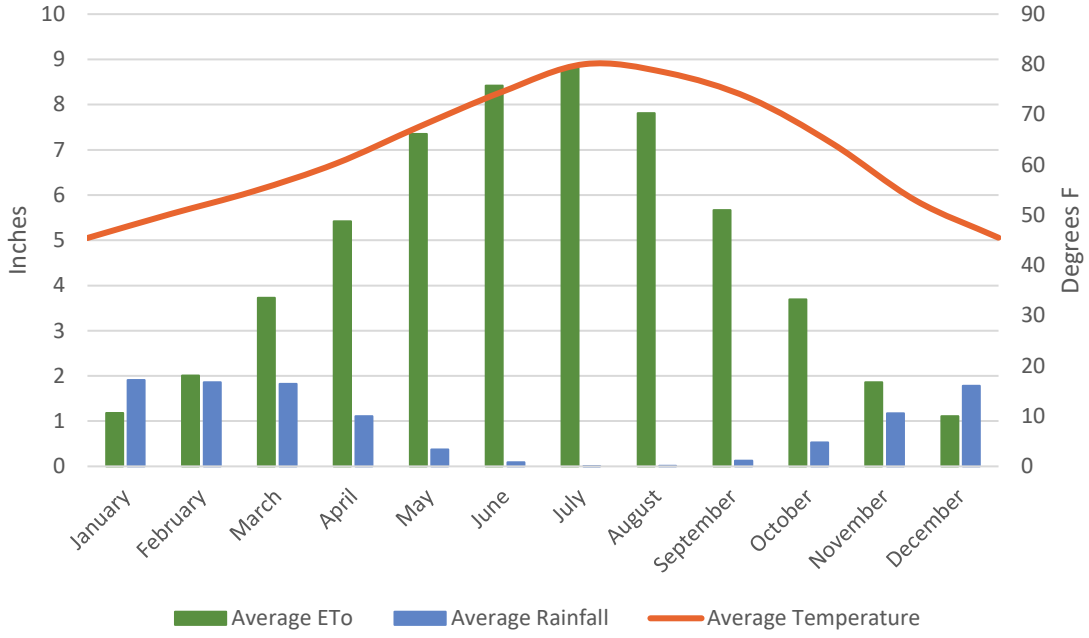
The City's climate is generally dry with mild winters and hot summers. Historically, the warmest month is July, with average temperatures reaching more than 98-degrees Fahrenheit. Winds are generally from the northwest, following the layout of the San Joaquin Valley. The standard monthly average evapotranspiration (ETo) rates, rainfall, and temperature are summarized in **Table 3-2**.

Table 3-1: Climate Statistics

Month	Average ETo [1] (inches)	Average Rainfall [2] (inches)	Temperature [2] (degrees F)		
			Average Minimum	Average Maximum	Average
January	1.18	1.91	36	55	45
February	2.01	1.86	39	61	50
March	3.73	1.82	42	67	55
April	5.42	1.11	46	75	60
May	7.35	0.37	51	84	68
June	8.42	0.09	57	92	74
July	8.81	0.01	62	98	80
August	7.81	0.01	60	96	78
September	5.67	0.13	56	91	73
October	3.69	0.53	48	80	64
November	1.86	1.17	40	66	53
December	1.11	1.78	36	55	46
Total/Average	**57.06**	**10.80**	**48**	**77**	**62**

Notes:
[1] (CIMIS, 2021); Fresno State – San Joaquin Valley Station 80.
[2] (Center, 2021); Station 045233 – Madera, CA; Period of reporting – 1928 to 2020

Figure 3-3: Climograph



3.3.1 Climate Change

DWR guidelines require urban water suppliers to consider the potential effects related to climate change as in the UWMP as it relates to water demands, water supply, and water supply reliability. These topics are addressed in Sections 4, 6, and 7 of the UWMP, respectively.

California has a Mediterranean climate, which is not expected to change with climate change projections in the future. The climate consists of cool, wet winters and hot, dry summers typically.

According to climate scientists, increases in global greenhouse gas levels are changing climate patterns around the world and, it is speculated, may begin to change at an accelerated pace from what has occurred in the past. An accelerated rate of change could potentially result in impacts to the local climate of the City in the form of higher temperatures, increased droughts and floods, decreased snowpack amounts, and durations and other extreme variations in weather patterns. As the UWMP projects through 2040, these changes could potentially manifest themselves over that period, and could potentially affect the availability and volume of water resources.

In the past, the amount of rainfall has been consistent, with periods of drought and periods of excess precipitation spaced relatively far apart. With climate change, the rainfall levels could begin to vary more from year to year, incurring droughts followed by excesses with less time between them. Typically, climate change predicts a decrease in average rainfall for the area, while temperatures are expected to increase. However, increased temperatures could intensify the El Nino Southern Oscillation (ENSO) cycle, possibly resulting in very abundant precipitation in wet years and drought level in dry years.

3.4 Service Area Population and Demographics

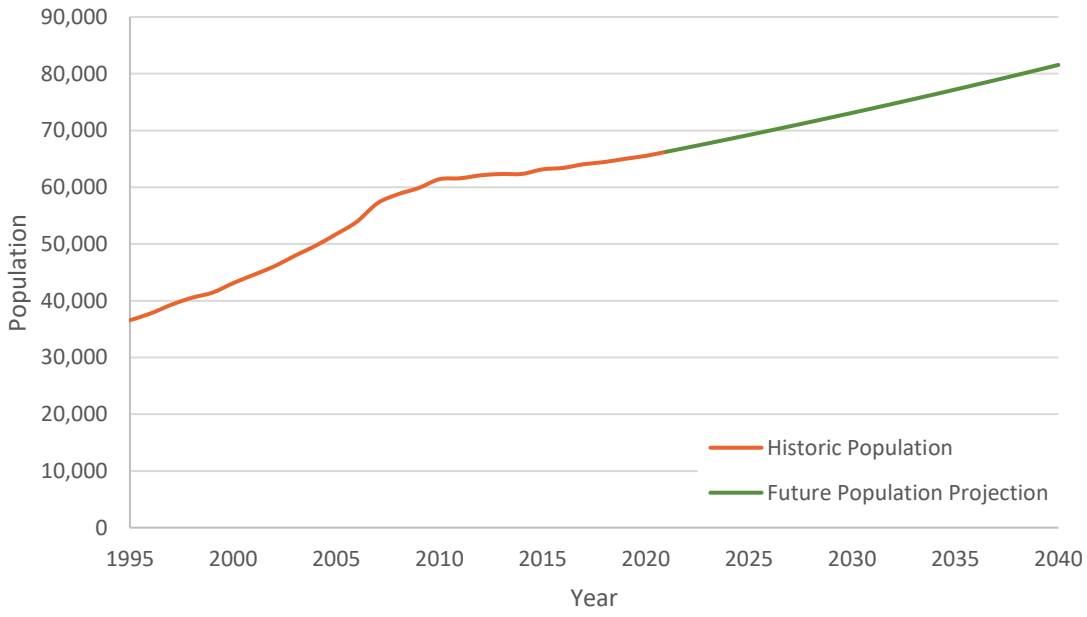
Population data for the City of Madera was obtained from the California Department of Finance (DOF) (DOF, 2021), which reports census data in years it is collected, as well as population estimates in years between censuses. DOF population estimates were also used in the 2010 and 2015 UWMPs. DOF population estimates from 2010 to 2015 have been revised since the 2015 UWMP, so revised numbers are presented in this UWMP. **Table 3-2** summarizes actual population growth for several periods as well as assumed growth rates from several reports.

Table 3-2: Population – Current and Projected (Submittal Table 3-1)

Service Area Population [1]	Years [2]				
	2020	2025	2030	2035	2040
City of Madera	65,526	69,210	73,101	77,211	81,552

Notes:
[1] Service area population is defined as the population served by the distribution system.
[2] Assumes 1.1% growth rate

Figure 3-4: Historical and Projected Population



3.5 Land Uses within Service Area

Land use in the City in 2015 is shown in the table below. According to the City's 2014 Groundwater Management Plan (Provost & Pritchard Consulting Group, 2014), the City had 1,100 acres of cropped land within the City limits. This cropping is generally just outside of urban areas.

Table 3-3: Land Uses

Land Use Category	City Limit Acreages	Percentage of Total
Commercial	1,257	11.9
Industrial	1,003	9.5
Very Low-Density Residential	54	0.5
Low-Density Residential	4,094	38.9
Medium-Density Residential	856	8.1
High-Density Residential	352	3.3
Neighborhood Mixed Use	4	0.0
Village Reserve	2	0.0
Office	135	1.3
Public and Semi-Public	1,472	14.0
Open Space	737	7.0
Resource Conservation	390	3.7
Freeway 99 R/W & Undesignated	180	1.7
Total	**10,536**	**100%**

Source: City of Madera, Department of Community Development

4 System Demands

This section describes and quantifies the current and projected water demands within the City's service area.

4.1 Non-Potable versus Potable Use

This section addresses demands that are met by non-potable and potable water sources. Recycled water is not available to the City. Recycled water and the potential for future use of recycled water is described in **Section 6**.

4.2 Past, Current, and Projected Water Use by Sector

Legal Requirements:

CWC § 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.

The UWMPA requires that the UWMP identify the quantity of water supplied to the City's customers including a breakdown by user classification.

The City utilizes several water use sectors identified in the CWC and tracks water use within those sectors separately. Historic water use and projected water use is presented in those sectors.

4.2.1 Water Use Sectors Listed in Water Code

Legal Requirements:

CWC § 10631(d)

(1) 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, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(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).

The City's water customers are divided into six categories that include single-family and multifamily residential, commercial/institutional, industrial, landscape irrigation, and other. Since the 2015 UWMP, the number of new water costumers has remained relatively flat but has shown on average an increase of approximately 1 percent annually. Much of the usage is attributed to single family residents, which currently accounts for about 59 percent of the City's total potable water demand. The City also tracks distribution systems losses via the water auditing process annually.

4.2.2 Past Water Use

The City maintains records of past water use, as shown in **Table 4-1** below. Recent water usages are at 20 year lows, and per capita water consumption in 2019 was at a historic low of 115 gallons per capita per day (gpcd). This decrease in demand can be attributed to statewide and local conservation measures enacted because of state mandates due to extreme drought conditions within California. **Table 4-1** shows the historical water production from 2000 to 2020. **Table 4-1** only accounts for total potable water.

Table 4-1: Past Water Production (2000 – 2020)

Year	Annual Potable Water Production			Population	
	Total Annual (AF)	Total Annual (MG) [1]	Daily Average (MGD) [2]	Population [3]	Per Capita Consumption (gpcd)
2000	11,834	3,856	10.6	43,089	245
2001	11,210	3,653	10.0	44,565	225
2002	11,868	3,867	10.6	46,066	230
2003	12,473	4,064	11.1	47,939	232
2004	12,886	4,199	11.5	49,691	232
2005	12,818	4,177	11.4	51,735	221
2006	13,299	4,333	11.9	53,928	220
2007	13,725	4,472	12.3	57,181	214
2008	13,763	4,485	12.3	58,767	209
2009	13,114	4,273	11.7	59,868	196
2010	11,742	3,826	10.5	61,416	171
2011	11,395	3,713	10.2	61,574	165
2012	11,742	3,826	10.5	62,096	169
2013	11,327	3,691	10.1	62,330	162
2014	10,635	3,465	9.5	62,342	152
2015	9,313	3,035	8.3	63,147	132
2016	9,203	2,999	8.2	63,407	130
2017	9,088	2,961	8.1	64,052	127
2018	8,393	2,735	7.5	64,436	116
2019	8,361	2,724	7.5	65,008	115
2020	8,754	2,853	7.8	65,526	119

Notes:
[1] Public Water System Statistics
[2] MGD = million gallons per day
[3] California Department of Finance Population Estimate

4.2.3 Distribution System Losses

Legal Requirements:

CWC § 10631

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 §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.

California Senate Bill No. 1420 ("SB 1420") requires water utilities that submit UWMPs to conduct annual system water loss audits in accordance with American Water works Association (AWWA) standards. Agencies are required to submit their audits every five years as part to the UWMP.

AWWA quantifies water loss as the difference between the quantity of water supplied and the quantity of water delivered to authorized customers. Water loss is further defined under two categories, apparent losses, and real losses. Apparent losses are due to unauthorized consumption, inaccurate metering, and systematic data handling errors. These losses can be considered non-physical losses associated with inaccurate recording. Real losses are the physical loss of water due to leaks within the distribution system.

Table 4-2 summarizes the findings of the City's water loss audit for the last five years. The detailed water loss audit reports are available in **Appendix B**.

Table 4-2: Last Five Years of Water Loss Audit Reporting (Submittal Table 4-4)

Reporting Period Start Dates	Total Volume of Water Loss (AF)	Percent of total Water Supplied (%)	Complies with CWC §10608.34
January 2016[1]	--	--	No
January 2017	1,257	13.8%	Yes
January 2018	340	4.1%	Yes
January 2019	305	3.6%	Yes
January 2020[2]	75	0.9%	N/A

Notes:

[1] City of Madera has not completed a water loss audit for 2016.

[2] The 2020 City of Madera Water Loss Audit has not been prepared as of the date of this report. Total loss volume shown is estimated using the average of the prior 2 years loss percentage.

4.2.4 Current Water Use

Table 4-3 summarizes the City's current water use by customer class type. Losses shown below are estimated using the average loss percentage from the most recent two years of water loss audits.

Table 4-3: Demands for Potable and Non-Potable Water – Actual (Submittal Table 4-1)

Use Type	Additional Description	Level of Treatment When Delivered	Volume (AF)
Single-Family Residential	Includes residential landscape	Drinking Water	5,214
Multifamily Residential	Includes residential landscape	Drinking Water	1,553
Commercial/Institutional	Includes schools	Drinking Water	1,282
Industrial		Drinking Water	80
Landscape		Drinking Water	550
Other		Drinking Water	0
Losses	Accounts for real and apparent losses	Drinking Water	75
		Total	**8,754**
Notes: [1]			

Figure 4-1 provides a graphical representation of the information presented in **Table 4-4**; however, groundwater recharge is not shown on the figure, as it is not a direct use of potable water supplies.

Figure 4-1: 2020 Water Use by Sector

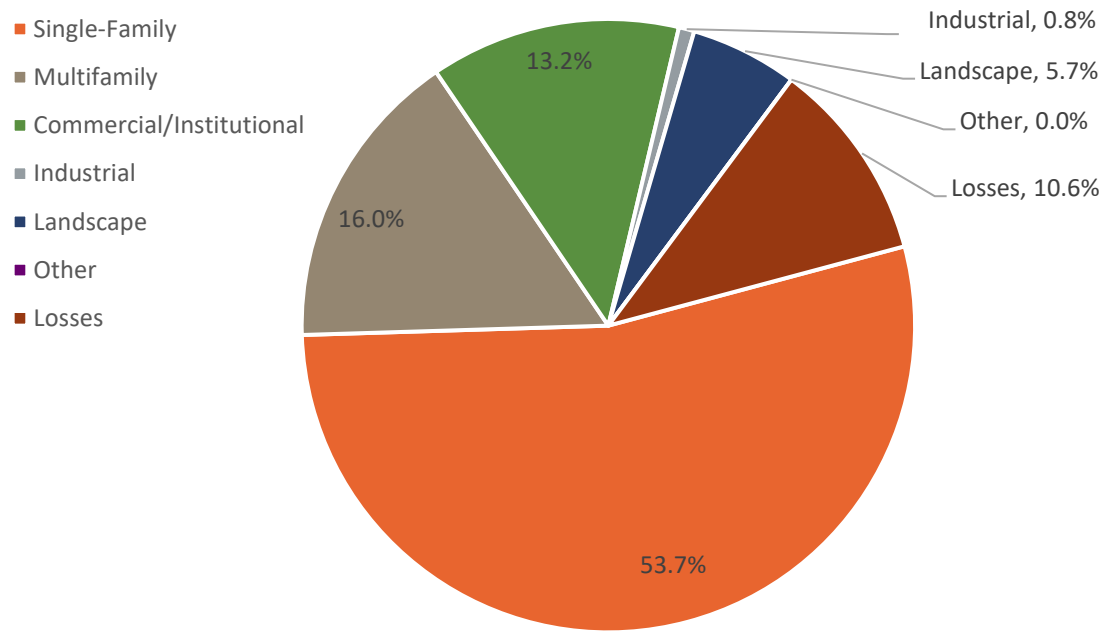
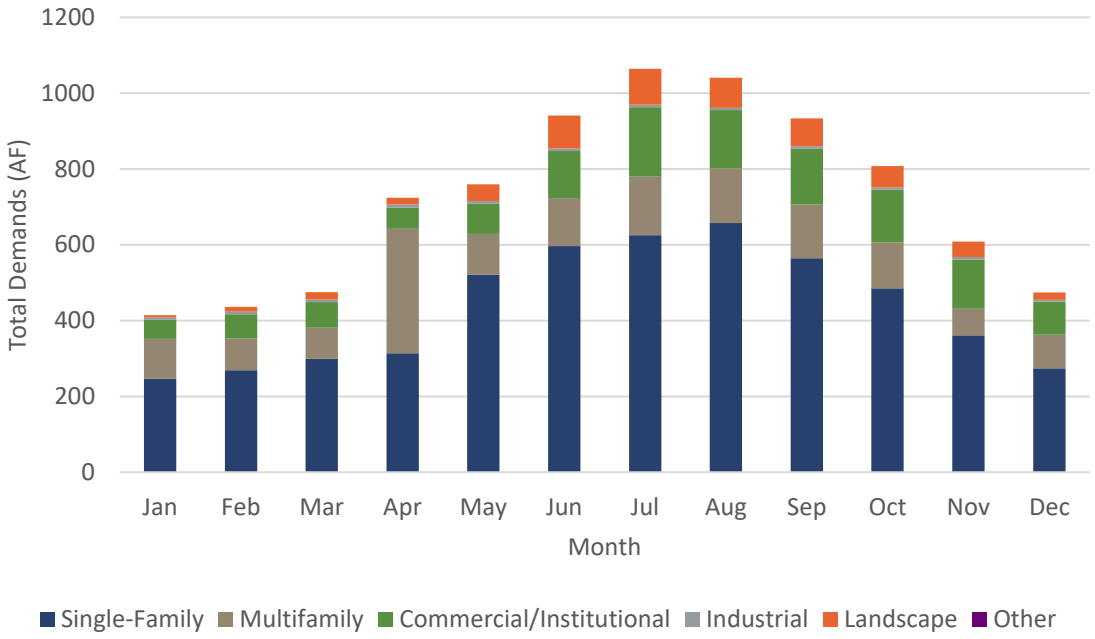


Figure 4-2: 2020 Water Demands by Month



4.2.5 Projected Water Use

Legal Requirements:

CWC §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 §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…

CWC §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.

This section is based on a normal water year and normal water use, without additional restrictions put in place. Section 7 discusses, in detail, water demand and supply characteristics associated with single-dry and multiple-dry years, including a Drought Risk Assessment.

Table 4-4 represent the total sum of projected water demands for potable and raw use within the service area from 2025 to 2040 for normal years. These demands represent the City's total water demand in the future. Section 6 further discusses the current and projected use of recycled water

Table 4-4: Use for Potable and Non-Potable Water – Projected (Submittal Table 4-2)

Use Type	Additional Description	Projected Water Use (AF) [1]			
		2025	2030	2035	2040
Single-Family	Includes residential landscaping	8,450	8,145	8,603	9,087
Multifamily	Includes residential landscaping	2,517	2,426	2,563	2,707
Commercial/Institutional	Includes schools	2,225	2,350	2,482	2,622
Industrial		138	146	154	163
Landscape		955	1,008	1,065	1,125
Other		0	0	0	0
Losses [2]		585	618	653	689
	Total	**14,870**	**14,694**	**15,520**	**16,392**

Notes:
[1] Projected water use is based on the 2020 Water Use Target of 196 gpcd for non-residential uses and 183 gpcd in 2025 and 167 gcpd in 2030 for residential uses, as discussed below, and using the population projections discussed in Section 3.
[2] Water loss is estimated based on the average water loss documented for 2018 and 2019.

Table 4-5 represents the total sum of projected water demands for potable and raw water use within the service area. These demands represent the City's total water demand in the future. Section 6 further discusses the current and projected use of recycled water.

Table 4-5: Total Water Use (Potable and Non-Potable) (Submittal Table 4-3)

Demand Use	2020	2025	2030	2035	2040
Potable Water, Raw, Other Non-Potable	8,754	14,870	14,694	15,520	16,392
Recycled Water	0	0	0	0	0
Total Water Demands	**8,754**	**14,870**	**14,694**	**15,520**	**16,392**

4.2.5.1 Water Savings Estimate

Demands in Table 4-5 are based on the 2020 Water Use Target (196 gpcd) for all uses except single-family and multifamily. In those instances, the Water Use Target has been reduced to 183 gpcd in 2025 and 167 gpcd in 2030 and beyond. The purpose of this reduction is to address the efficient indoor residential water use standards discussed in AB 1668 and SB 606 of 55 gpcd until January 2025 and 50 gpcd until January 2030. Additional water savings, such as mandated conservation measures, have not been included in the projections to allow for the City to plan in a conservative manner.

Water savings from codes, standards, ordinances, or transportation and land use plans are also known as "passive savings." These various factors generally decrease the water use for new and future customers, compared to historical customers. These codes and ordinances may include implementation

of the Model Water Efficient Landscape Ordinance (MWELO), the California Energy Commission Title 20 appliances standards for toilets, urinals, faucets, and showerheads, or the CALGreen Building Code.

As shown in **Table 4-4**, passive savings have not been specifically incorporated in projected water demands. Instead, future water demands are projected based on population and the City's target per capita water use, as documented in Section 5, and discussed above. However, the City does expect that passive savings, such as continued implementation of the City's Water Efficient Landscape Ordinance, Title 20 appliance standards for toilets, urinals, faucets, and showerheads, and CALGreen Building Code requirement, will help the City continue to meet its target per capita water demand in the future.

4.2.6 Characteristic Five-Year Water Use

CWC §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.

As part of the Drought Risk Assessment prepared in Section 7, the following five-year water use (see **Table 4-6**), between 2020 and 2025, can be utilized as a representative five-year normal period.

Table 4-6: Five-Year Projected Water Use

Year	Five-Year Projected Water Use		
	Projected Potable Water Use (AF)	Projected Non-Potable Water Use (AF)	Total Projected Water Use (AF)
2021	9,977	0	9,977
2022	11,201	0	11,201
2023	12,424	0	12,424
2024	13,647	0	13,647
2025	14,870	0	14,870

4.3 Water Use for Low Income Households

Legal Requirements:

CWC § 10631

(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 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.

As described above, the UWMP is required to account for low-income household water demands. Low-income households are defined as families with an income less than 80-percent of the area median income, adjusted for family size.

To calculate low-income water demands, the current and projected water use of single-family and multi-family residential households were used in conjunction with the estimated percent of low-income households planned within the service area. It is understood that the Regional Housing Needs Allocation identified approximately 39 percent of the housing within the City will be within the extremely low, very low, and low income categories between 2014-2023 (City of Madera, 2015). For the determination of projected low-income housing, it is assumed that 39-percent will remain consistent throughout 2040.

To determine water demands for low-income housing, the water demands in Table 4.3 for single-family and multifamily units were multiplied by the percentage of low-income households. Water demands associated with low-income residential water users through year 2040 are presented in **Table 4-7**.

Table 4-7: Low Income Water Demands

Low Income Water Demands	Water Use (AF)				
	2020	2025	2030	2035	2040
Single- and Multifamily Residential	2,639	4,277	4,123	4,355	4,599
Total (AF)	**2,639**	**4,277**	**4,123**	**4,355**	**4,599**

As shown in **Table 4-8**, lower income demand projections presented in **Table 4-7** are included in the total water use projections provided in **Table 4-4**.

Table 4-8: Inclusion of Water Use in Projections (Submittal Table 4.5)

Scenario	Response
Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number where citations of the codes, ordinances, etc. utilized in demand projections are found.	Section 4.2
Are Lower Income Residential Demands Included in Projections?	Yes

4.4 Climate Change Related to System Demands

Legal Requirements:

CWC §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.

CWC §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…

(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.

As climate change becomes more noticeable and quantifiable, the City's response will include reducing demands to match possible reduction of water supplies. The potential impacts of climate change on the City's supply could include such items as more prolonged droughts, shifts in water supply patterns, and potential flooding.

Reduction of the per capita demands in the system can help respond to climate change in two ways. Reduced water demands equate to less energy use through reduced groundwater pumping and/or movement of water supplies through the system. Further reduction of per capita water demands, at this point of the City's master planning efforts, may be challenging to achieve, as the City has implemented many conservation methodologies (discussed in further detail in Section 9); however, one strategy the City may choose would be to initiate the use of recycled water to use their water supplies more efficiently (this use has not been planned for in this UWMP but may be included in the future).

Additionally, it is anticipated climate change will impact landscape water demands most significantly; however, as the City will maintain the per capita goal, overall water demands are not anticipated to increase. Mitigating possible increased water demands for landscape may require less landscaping, increased use of drought tolerant plantings, or more efficient irrigation strategies. The City employs an approved plants list inclusive of mostly drought tolerant plantings for landscaping on all new construction projects and is considering modification to turf allowances within the City. These measures will help to respond to water demand variations as a result of climate change.

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5 SBx7-7 Baselines, Targets, and Compliance

This section describes the baseline (base daily per capita) water use, the 2015 and 2020 water use targets, and the 2020 actual water use.

The UWMPA requires that the UWMP identify a baseline water demand, urban water use target, and interim urban water use target for the City.

Legal Requirements:

> ***CWC § 10608.20***
>
> *(e) An urban retail water supplier shall include in its urban water management plan. . . due in 2010 the 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.*

The base daily per capita use was the first step in determining the City's urban water use target. The historical per capita use set the "baseline" on which the urban water use target was determined. The City established an Interim 2015 water use target and a subsequent 2020 urban water use target to judge compliance with the 2020 use reductions set forth in the Water Conservation Bill of 2009.

5.1 SBx7-7 Forms and Summary Tables

The City will use previously calculated values from the baseline target in 2015 to determine compliance with the SBx7-7. The following subsections present the SBx7-7 Verification forms according to the 2020 UWMP Guidebook requirements.

5.1.1 SBx7-7 Verification Form

The 2015 UWMP include a complete SBx7-7 Verification Form and is referenced in **Appendix C**. For this reason, and as recommended in the 2020 UWMP Guidebook, a New Verification Form has not been prepared with the 2020 UWMP.

5.1.2 SBx7-7 2020 Compliance

The City's 2020 per capita water use goal that was set in the 2015 UWMP is 196 gpcd. The City has met this goal with a water use average of 119 for the year 2020 and achieved SBx7-7 compliance.

5.1.3 DWR Submittal Tables

In addition to reporting compliance on the SBx7-7 Compliance Form, the City is also required to report compliance on the DWR Submittal Tables, 5-1 and 5-2, shown below.

Table 5-1: Baselines and Targets Summary (Submittal Table 5-1)

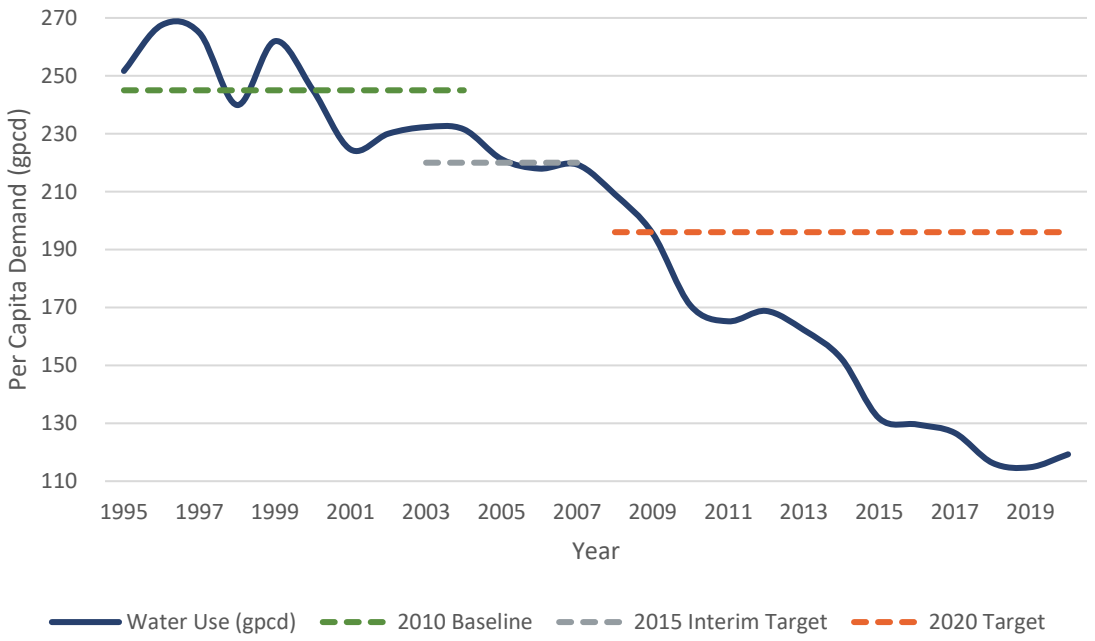
Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target
10-15 Year	1995	2004	245	196
5 Year	2003	2007	220	

Table 5-2: 2020 Compliance (Submittal Table 5-2)

Actual 2020 GPCD	2020 Total Adjustments	Adjusted 2020 GPCD	2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020
119	0	119	196	Yes

Figure 5-1 is a graphical representation of the City Per Capita Water Use since 2010, when the baselines and targets were initially required. This figure highlights the City's success in consistently decreasing its Per Capita Water Use.

Figure 5-1: Historical Per Capita Water Use



5.2 Baseline and Target Calculations for 2020 UWMPs

The City revised its calculations in the 2020 UWMPs based on population changes in the area. The 2020 UWMP Guidebook indicates criteria to determine if the Supplier should or should not consider recalculation of its baselines and targets. Those criteria are discussed in the following subsections. As

indicated below, the City does not meet a criterion to recalculate its baselines and targets and meets the criterion to utilize those calculated in the 2015 UWMP.

Supplier Submitted 2015 UWMP, No Change to Service Area

The City did prepare and submit the 2015 UWMP, along with the SBx7-7 Verification Form, both of which were accepted by DWR. The City has also not had a change to its service area, as noted in the Guidebook. The Guidebook clarifies "change to its service area" as follows:

> "…changes to the service area based solely on new construction do not require recalculation of the baselines and targets. For purposes of this section, changes to the service area refers to mergers and annexations…"

Based on this definition, the City has not had a change to its service area. The City has prepared the 2020 Compliance Form, see **Appendix D** and the 2015 Verification Form, see **Appendix C**, for review and reference.

Supplier Did Not Submit 2015 UWMP

This criterion does not apply to the City; the 2015 UWMP was submitted and accepted.

Supplier Newly Subject to UWMP Requirements

This criterion does not apply to the City.

Distribution Area Expansion

Stated in the 2020 UWMP Guidebook, "If the Suppliers service area expanded by way of a merger or annexation, the Supplier must provide baseline and targets to include the new area." While there were annexations within the City, all were the result of new construction and, as discussed in above, new construction does not qualify the City to recalculate its baselines and targets.

Distribution Area Contraction

This criterion does not apply to the City.

Large Partial Customers Become Whole Customers

This criterion does not apply to the City.

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6 System Supplies

The Urban Water Management Planning Act (UWMPA) requires that the Urban Water Management Plan (UWMP) include a description of the agency's existing and future water supply sources for the next 20 years. The description of water supplies must include detailed information on the groundwater basin such as water rights, determination if the basin is in overdraft, adjudication decree, and other information from the groundwater management plan.

6.1 Water Supply Analysis Overview

Legal Requirements:

> ***CWC §10631(b)*** *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier [in five-year increments to 20 years or as far as data is available] 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.*

The City is entirely reliant on groundwater sources for their water supply; it is not anticipated this will change in the near future with regards to water supply for potable consumption. The following sections quantify each supply, including future planned supplies over five-year increments through 2040. These supply sources will be quantified for the normal year, single-dry year, and a five-year period of multiple dry years.

The City's groundwater supplies are extracted from the Madera Subbasin, an unadjudicated basin underlying the area. While the basin does not have legal limitations on groundwater pumping, the City is a participant in the City of Madera Groundwater Sustainability Agency (CMGSA) and a party to the Madera Subbasin Joint Groundwater Sustainability Plan (MJGSP)[2]. The CMGSA is working cooperatively with the six (6) other GSAs in the Madera Subbasin to manage the groundwater aquifer and reach sustainability by 2040. As part of those efforts, the agencies have agreed to manage groundwater extraction in a way that does not cause undesirable results in the aquifer.

6.2 Water Supply Characterization

The following subsections provide water supply availability quantification and narrative required under the CWC.

[2] The MJGSP was prepared by four (4) of the seven (7) GSAs within the subbasin, including the CMGSA.

6.2.1 Purchased or Imported Water

Historically, the City water supply has been almost 100 percent from groundwater. In the past, the City has purchased small quantities of surface water from Madera Irrigation District for use as groundwater recharge in basins around the service area. Based on recent water audits, the City has not purchased or imported water since at least 2017. For the purposes of this UWMP, it is assumed that the City does not purchase or import water.

6.2.2 Groundwater

Legal Requirements:

CWC §10631(b)(4) *If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:*

(A) 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.

(B) 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).

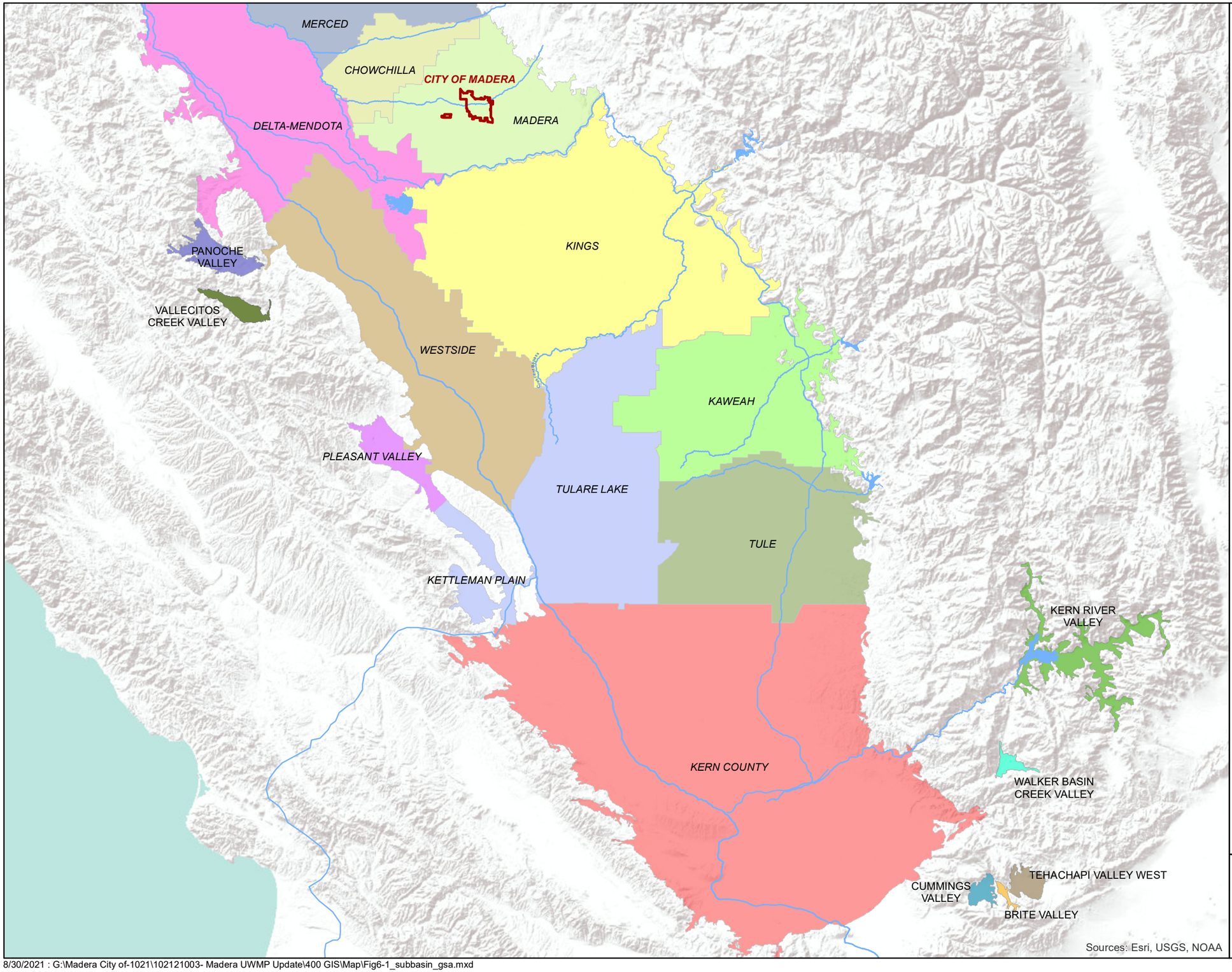
(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(D) 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.

6.2.2.1 Basin Description

The City is located in the San Joaquin River hydrologic region and extracts its groundwater from the Madera Subbasin, one of nine subbasins in the San Joaquin Valley Groundwater Basin. **Figure 6-1** shows the location of the City within the groundwater basin. The total surface area of the subbasin is 394,000 acres, or 614 square miles. The City occupies less than 3 percent of this total area. The Madera Subbasin consists of alluvium emanating from the Sierra Nevada range. The Subbasin is bounded on the south by the San Joaquin River, on the west by the eastern boundary of the Columbia Canal Service Area, on the north by the southern boundary of the Chowchilla Subbasin, and on the east by the crystalline bedrock of the Sierra Nevada foothills.

The current volume of water in the entire basin, or in the basin underlying the City, is not precisely known at this time, and is dependent on groundwater levels and the base of fresh water. However, the groundwater basin has significant reserves. According to DWR's Bulletin 118 – California Groundwater (2004) the Madera Subbasin had 12,600,000 AF of storage to a depth of 300 feet in 1995 (DWR, 2003).



Legend

- City of Madera
- Water Features

Groundwater Subbasins

San Joaquin Valley (5-22)

- Chowchilla (5-22-05)
- Delta-Mendota (5-22-07)
- Kaweah (5-22-11)
- Kern County (5-22-14)
- Kettleman Plain (5-22-17)
- Kings (5-22-08)
- Madera (5-22-06)
- Merced (5-22-04)
- Pleasant Valley (5-22-10)
- Tulare Lake (5-22-12)
- Tule (5-22-13)
- Westside (5-22-09)

Other

- Brite Valley (5-80)
- Cummings Valley (5-27)
- Kern River Valley (5-25)
- Panoche Valley (5-23)
- Tehachapi Valley West (5-28)
- Walker Basin Creek Valley (5-26)

Figure 6-1
Groundwater Basins and Subbasins

City of Madera
2020 Urban Water Management Plan

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CONSULTING GROUP
An Employee Owned Company

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Aquifers in the Madera Subbasin consist of alluvial sediments composed of unconsolidated gravels, sands, silts, and clays. Major streams in the area include the San Joaquin and Fresno rivers. The Madera Subbasin has been in an overdraft condition for many years. DWR Bulletin 118[3] includes a detailed description of the Madera Subbasin and its characteristics and conditions.

6.2.2.2 Groundwater Quality

Groundwater within the Madera Subbasin has generally been high quality. While total dissolved solids (TDS) ranges from 100 to 6,400 milligrams per liter (mg/L) within the Subbasin, average TDS is 215 mg/L (DWR, 2003).

Groundwater is mainly of a bicarbonate type throughout most of the Subbasin, transitioning from calcium- and calcium-magnesium-bicarbonate water in the east of the Subbasin to sodium-bicarbonate water in the west of the Subbasin. Sodium increases near the western edge of the Subbasin along with increasing chloride, to produce poor quality sodium-chloride type water. Average TDS concentration increases in the western portion of the Subbasin.

The City does not have wellhead treatment on any active well within its supply portfolio, other than chlorination, and is in compliance with the regulated constituents, as defined by the State Water Resources Control Board and regulated by the Division of Drinking Water.

6.2.2.3 Groundwater Sustainability Plan

The City formed its own GSA called the City of Madera GSA (CMGSA). The CMGSA is working collaboratively, under a coordination agreement with the other six (6) GSAs in the Madera Subbasin to achieve sustainable groundwater conditions by 2040 in accordance with the Sustainable Groundwater Management Act of 2014 (SGMA) for critically overdrafted groundwater basins such as the Madera Subbasin. The CMGSA assisted in the preparation of the MJGSP, which was submitted to the Department of Water Resources in January 2020 in compliance with SGMA .

SGMA identifies six (6) sustainability indicators to be monitored and reported to document sustainability: lowering groundwater levels, reduced [groundwater] storage, seawater intrusion, degraded [groundwater] quality, land subsidence, and surface water depletion. The CMGSA documents five (5) of those with seawater intrusion not being applicable to this region. .

6.2.2.4 Historical Groundwater Pumping

The City's sole source of drinking water is groundwater. The City currently obtains groundwater from groundwater wells. The City owns and operates 20 groundwater wells; 17 are active wells and 3 are considered inactive wells. The combined pumping capacity of the City wells is approximately 19,700 gallons per minute (gpm).

In 2020, groundwater provided 100 percent of the total potable water use. The historical volume of groundwater pumped by the City over the past five years is provided in **Table 6-1**. The groundwater usage has reduced since 2016 could potentially remain below the 2020 water use target, as discussed

[3] https://water.ca.gov/programs/groundwater-management/bulletin-118

later in this section. However, water demand projections utilize the 2020 water use target discussed in **Section 5** for conservative planning purposes.

Table 6-1: Groundwater Volume Pumped (Submittal Table 6-1)

Groundwater Type	Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	Madera Subbasin 5-22.06	9,203	9,088	8,393	8,361	8,754
Total		**9,203**	**9,088**	**8,393**	**8,361**	**8,754**
Units: AF						

6.2.3 Surface Water

The Fresno River flows through the City from the east; this section of river is mostly dry unless the river stage is high enough to spill over the John Franchi Diversion Dam. The Fresno River is an important source of natural groundwater recharge for the City. The City has no water rights for the Fresno River water, nor any surface water contracts with U.S. Department of the Interior, Bureau of Reclamation, State Water Project, or other surface water purveyors. Historically, the City's water supply has been 100 percent from groundwater. In the past, the City has purchased small quantities of surface water from Madera Irrigation District for recharge purposes, not use within the drinking water system. Refer to **Section 6.2.7** for more information.

According to the Regional Groundwater Management Plan (GMP), the City had 1,100 acres of cropped land within the City limit, generally just outside of the urban area. These lands had a total irrigation demand of 2,500 AF/year. The private landowners receive both surface water from Madera Irrigation District, estimated at 1,900 AF/year, and use groundwater from private wells, estimated at 600 AF/year, to meet demands. These supplies and demands are not considered in the UWMP's water supply analysis; the City does not have surface water supplies.

6.2.4 Stormwater

The City also has numerous stormwater basins. Some are connected to MID facilities and can receive surface water for recharge. Small quantities of MID surface water have been purchased and recharged in these basins. In recent years, the stormwater basins are operated to maximize the volume of stormwater that is captured and recharged locally, by keeping the stormwater in the basins for as long as possible for the purposes of maximizing percolation opportunities. The City may take actions to enhance the percolation and recharge opportunities, such as adding vertical percolation wells and turnout gates from MID facilities to storm drainage basins. In events where storm drainage basin capacity is potentially exceeded, water is sent to local streams and irrigation canals to allow basins to accommodate further runoff. No data is currently available on stormwater recharge volumes in the City.

6.2.5 Wastewater and Recycled Water

The City does not recycle water for direct use of any kind. Treated effluent from the wastewater treatment facility (WWTF) is disposed through on-site percolation ponds. Although, this is not

considered recycled water according to UWMP guidelines, it still helps to recharge the groundwater supply. This section describes the City's wastewater system and potential opportunities for recycled water.

6.2.5.1 Recycled Water Coordination

Legal Requirements:

> ***CWC §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*

As part of the integrated master planning process, a recycled water feasibility study was completed in 2013 (Montgomery Watson Harza, 2013). This study evaluated the feasibility of constructing a new recycled water system for servicing selected users. The City coordinated with various water users, and several were identified as part of the feasibility study, including Madera Unified School District, City parks, and the municipal golf course. Several alternatives were developed as part of the recycled water feasibility study. The study estimated that recycled water usage could eventually be as high as 3,300 AF/year. Recycling wastewater was found to be technically feasible, and the study found there would be demand for the recycled water. However, all alternatives were considered to be cost-prohibitive at the time; the cost to treat and distribute the water would be far more than potential water fees collected at the rates the City believes could be charged. The report instead recommended that City Well 27, which has required treatment before potable use, be used to provide non-potable water to certain customers, thus conserving the City's supply of potable well water.

6.2.5.2 Wastewater Collection, Treatment, and Disposal

Legal Requirements:

> ***CWC §10633***
>
> *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.*

6.2.5.2.1 Wastewater Collection System

Wastewater is collected throughout the City via a network of sanitary sewer collection pipelines ranging from 8 to 48 inches in diameter. With the aid of five sewer lift stations, the influent is gravity-fed to the WWTF, located approximately seven miles west of the City limits. The WWTF was constructed in 1972 and provides primary and secondary treatment without disinfection. A plant expansion and upgrade were completed in 2007, which resulted in a treatment capacity of 10.1 MGD. The WWTF has 280 acres of land for incidental recharge and evaporation of effluent. The treatment process consists of screening, grit removal, sedimentation, an activated sludge process, and final clarification. Also included in the plant expansion were an odor control and a water reclamation system for onsite uses.

There are approximately 13,000 residential wastewater connections, each typically with a 4-inch sewer service connecting to the main. Commercial and industrial customers number just over 1,000 and are connected with service lines appropriate to handle their particular wastewater load. The average daily wastewater volume for 2020 was estimated to be approximately 5.1 MGD. The City has no facilities for

extensive storage of the wastewater before treatment. Septic haulers from outside the City service area bring in an additional volume of wastewater. The most recent data show that outside septic waste collection contributes less than 1 percent of total volume, though the biological loading is disproportionately higher due to the higher strength of the septage versus domestic wastewater. **Table 6-5** summarizes the current wastewater collected within the City.

6.2.5.2.2 Wastewater Treatment Facilities

The effluent from the City's WWTF is disposed to fourteen 20-acre percolation/evaporation ponds. The WWTF Expansion Predesign Report by Boyle Engineering (July 2004) proposed a system of recovery wells that would pump groundwater from under the percolation ponds to an MID canal for agricultural irrigation. This pumping of percolate would be intended to reduce groundwater mounding under the WWTF and to control elevated concentrations of nitrate or other contaminants in the underlying groundwater. A recovery well has been installed, but the implementation of the project has encountered regulatory hurdles and the system has yet to be operated as planned.

In the 2010 UWMP, future wastewater collection and treatment data were generated by assuming a 50 percent return-to-sewer ratio for water use within the City. In 2015, the ratio was 58%, which likely reflects the anomalous and extensive 2015 State-mandated water conservation requirements, which primarily reduced outdoor water use. In 2020, the ratio was approximately 65%, which likely reflects continued conservation efforts. **Table 6-3** summarizes the current wastewater treated and discharged by the City.

Table 6-2: Wastewater Collected Within Service Area in 2020 (Submittal Table 6-2)

Wastewater Collection			Recipient of Collected Wastewater		
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020 (AF)	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?
City of Madera	Measured	5,715	City of Madera	Madera Wastewater Treatment Facility	Yes

Table 6-3: Wastewater Treatment and Discharge (Submittal Table 6-3)

Wastewater Treatment Plant Name	Treatment Level	2020 Volumes			
		Wastewater Treated (AF)	Discharged Treated Wastewater (AF)	Recycled within Service Area (AF)	Recycled Outside of Service Area (AF)
Madera Wastewater Treatment Facility	Secondary, Disinfected	5,715	5,715	0	0
	Total	**5,715**	**5,715**	**0**	**0**
Discharge Information	Discharge Location Name or Identifier				WWTF Percolation Ponds
	Discharge Location Description				280 acres at WWTF
	Method of Disposal				Percolation Ponds
	Does this Plant Treat Wastewater Generated Outside the Service Area?				Yes, Septage

6.2.5.3 Recycled Water System Description

Legal Requirements:

CWC §10633

(c) (Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

The City does not recycle water. Treated effluent from the WWTF is disposed of through percolation ponds at the WWTF, which, though not considered recycled water by the Department of Water Resources, still helps recharge the Madera Groundwater Subbasin.

6.2.5.4 Potential, Current, and Projected Recycled Water Uses

Legal Requirements:

CWC §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.

The City does not currently use recycled water within its service area. The City completed a recycled water study, which found water recycling to be economically unfeasible at the time. Several potential beneficial uses exist, including industrial water usage, landscape and golf course irrigation, and agricultural irrigation. If economic conditions change, or the City can successfully secure grants for a major portion of the capital costs, the City may reconsider recycled water in the future.

Any potential use for recycled water would have to improve water balance from the current operation, which effectively allows most treated wastewater to percolate back to the drinking water aquifer. An application where recycled water could directly replace groundwater pumping would be a more efficient use of the water and could be advantageous if the business case could be made. **Table 6-4** shows the current and projected recycled water direct beneficial users.

Table 6-4: Current and Projected Recycled Water Direct Beneficial Uses (Submittal Table 6-4)

Name of Agency Producing (Treating) the Recycled Water					N/A		
Name of Agency Operating the Recycled Water Distribution System					N/A		
Supplemental Water Added in 2020					0		
Source of 2020 Supplemental Water					N/A		
Beneficial Use Type	General Description of 2020 Users	Level of Treatment	2020	2025	2030	2035	2040
N/A	N/A	N/A	0	0	0	0	0
Total							

Note:
IPR = Indirect Potable Reuse

6.2.5.4.1 Planned versus Actual Use of Recycled Water

Legal Requirements:

CWC §10633

(e) (Provide) a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

Previous studies done by the City found production and use of recycled water to be fiscally infeasible. The City's 2015 UWMP briefly discussed looking at grant funding opportunities to explore development of a recycled water system and discussed exploring opportunities to support local industrial and commercial customers to develop on-site water recycling. With the uncertainties around developing a recycled water system the City did not project any recycled water use through 2040 in the 2015 UWMP. **Table 6-5** compares the 2015 projection for City recycled water use in 2020 against actual 2020 recycled water use for 2020.

Table 6-5: 2015 Recycled Water Use Projection Compared to 2020 Actual (Submittal Table 6-5)

Use Type	2015 Projection for 2020	Actual 2020 Use
N/A	0	0

Units: AF

6.2.5.5 Actions to Encourage and Optimize Future Recycled Water Use

Legal Requirements:

CWC §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.

While the City's earlier study found production and use of recycled water to be uneconomical, the City may reconsider a recycled water system if a significant portion of the capital costs can be funded through grants and if uses can be found which directly reduce use of potable water. The City can also aid industrial or commercial customers in developing recycling water on-site. **Table 6-6** summarizes the actions taken by the City to encourage and optimize future recycled water use.

Table 6-6: Methods to Expand Future Recycled Water Use (Submittal Table 6-6)

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
On-site recycled water development	Assist commercial and industrial customers with developing recycled water on-site	On-going	Unknown
Grant funding opportunities for recycled water projects	Seek funding for capital projects if economics of recycled water improve	Unknown	Unknown

6.2.6 Desalination Water Opportunities

Legal Requirements:

CWC §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 groundwater that the City relies on is not brackish or in need of desalination. If this were to change in the future, the City will consider this option.

6.2.7 Exchanges or Transfers

Legal Requirements:

CWC §10631(c) *Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

The City occasionally purchases small quantities of surface water, typically a few hundred acre-feet at a time, from MID to recharge in City stormwater basins. Purchases are subject to approval by the MID Board of Directors. MID water supplies have been reduced due to the San Joaquin River Restoration Program, and it is expected that in the future they will only sell water in wet years when they have surplus supplies. There is currently no long-term agreement between the City and MID, and purchases are made on an ad hoc basis.

6.2.7.1 Exchanges

The City does not have any agreements in place to exchange water with other agencies, nor does the City have long term plans to exchange water. The City could work with MID or other agencies to exchange treated effluent for surface water, however given the scarcity of water it is unlikely that an opportunity would arise. Also, given the high costs of constructing a treatment plant to treat surface water exchange opportunities become even more unlikely

6.2.7.2 Transfers

The City does not have any long-term plans to transfer water rights from nearby water providers. As the City continues to expand, the City could explore opportunities to obtain water rights through transfers from areas annexed into the City.

6.2.7.3 Water Banking Facility

The City does not currently have any water banking facilities, nor does it have plans to participate in any water banking projects.

6.2.7.4 Emergency Interties

The City does not currently have any emergency interties with adjacent water systems.

6.2.8 Future Water Projects

Legal Requirements:

> ***CWC §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.*

Future water projects for the City of Madera are documented in their GMP and 2014 Water System Master Plan (WSMP).

Groundwater Management Plan

The GMP lists several projects that could help alleviate overdraft. These projects are listed below. Specific details on the projects are not included in the GMP.

- *Airport Basin*
- *Ellis Basin*
- *Fresno River Dam in City of Madera*
- *Future basin sites*
- *Future stormwater collection/recharge sites*
- *Golf course basin sites*
- *Schmidt Creek Flood Control and Groundwater Recharge Project*

Water System Master Plan

The WSMP proposed a Capital Improvement Program that includes approximately 114 miles of pipeline improvements, 24 new wells (22 of which are planned from 2020 through 2050), two new storage reservoirs, and two new booster stations that will convey water from the west side of the City to the east, with a project cost totaling over $148 million dollars through 2050. These projects address both existing deficiencies and necessary expansions to accommodate planned growth. Projects will be implemented as needed, not strictly on the schedule in the WSMP. The 2014 WSMP was based on a 3.5% growth annual population rate and a static per-capita water consumption rate. Currently, the City's growth rate is projected to be about 1.1% over time so WSMP implementation may proceed at a slower pace than anticipated. **Table 6-7** summarizes the water supply projects (new wells) outlined in the current WSMP.

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

Name of Future Projects or Programs	Joint Project with other suppliers?	Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
Groundwater Wells	No	Twenty-two new groundwater wells, per WSMP	2020 through 2050	Average Year	53,200 AFY

6.2.9 Summary of Existing and Planned Sources of Water

Legal Requirements:

CWC §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 10631(a).

(4)(D) (Provide 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.

6.2.9.1 Description of Supplies

6.2.9.1.1 Groundwater

The City plans to continue using groundwater to meet their water demands. The City has made extensive progress in reducing per capita demands, which has reduced stress on the groundwater aquifer.

6.2.9.1.2 Surface Water

The City has occasionally purchased small quantities of surface water from the Madera Irrigation District for recharge in City stormwater basins. The City may continue or expand surface water purchases to offset groundwater extraction, but there are currently no long-term agreements in place, and purchases are made on a year-to-year basis.

6.2.9.1.3 Supply from Storage

This section is not applicable.

6.2.9.1.4 Summary of Existing and Planned Sources of Water

Table 6-8 summarizes the existing and planned sources of water for the City.

Table 6-8: Water Supplies – Actual (Submittal Tables 6-8 and 6-9)

Water Supply	Additional Details on Water Supply	2020		2025	2030	2035	2040
		Actual Volume (AF)	Water Quality	Reasonably Available Volume (AF)			
Groundwater (not desalinated)	Madera Subbasin 5-22.06	8,754	Potable	14,870	14,694	15,520	16,392
Total		**8,754**		**14,870**	**14,694**	**15,520**	**16,392**

6.2.10 Special Conditions

6.2.10.1 Climate Change Impacts to Water Supply Sources

The impacts on the City's water supply due to climate change could take many forms but are likely to impact surface water supplies most. It is anticipated that precipitation will occur in the form of rain, not snowpack, more often and snowmelt and the associated runoff will begin earlier than in the past. This change will require more water storage facilities be available to capture the water supply that would have otherwise been 'stored' as snowpack in the mountains.

6.2.10.2 Regulatory Conditions

The introduction of SGMA has been a major modification to how water supplies are considered. The Madera Subbasin has a good plan to work cooperatively in managing their groundwater basin and reaching sustainability. It is not anticipated additional regulation will be introduced to further modify how the agencies can access and utilize water supply sources. If the cooperative approach to SGMA compliance does not continue, additional regulation may be a possibility in the form of adjudication of the groundwater basin.

6.3 Energy Consumption

The City tracks their energy use on a per supply source basis, i.e., energy use per well, on a monthly basis. In 2020, through pumps associated with groundwater wells, the City used approximately 8.3 million kilowatt hours (kWh) of power to produce 8,754 AF of water into the distribution system, yielding a power consumption of 948.8 kWh/AF as shown in the following table. These figures do not include energy used by the wastewater system, including wastewater delivered to the City WWTF, as those are attributable to the City of Madera. **Table 6-9** summarizes the energy usage for Madera in 2020.

Table 6-9: Energy Consumption (Submittal Table O-1A)

Urban Water Supplier:		City of Madera					
Start Date:	1/1/2020	Urban Water Supplier Operational Control					
End Date:	12/31/2020	Water Management Process					
	Units	Extract and Divert (A)	Place into Storage (B)	Conveyance (C)	Treatment (D)	Distribution (E)	Total Utility
Volume of Water Entering Process	AF	8,754	0	0	0	8,754	8,754
Energy Consumed	kWh	8,305,590	0	0	0	0	8,305,590
Energy Intensity	kWh/AF	948.8	0	0	0	0	948.8
Quantity of Self-Generated Renewable Energy:		0 kWh					
Data Quality:	Metered Data						
Data Quality Narrative:	Column A accounts for all water into the system and the associated energy to extract it from the ground (i.e. groundwater well pumps); Column E accounts for all water distributed through the water system and energy associated with moving it throughout the system via booster pumps, including into and out of temporary storage reservoirs.						

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7 Water Supply Reliability

The Urban Water Management Planning Act (UWMPA) requires that the Urban Water Management Plan (UWMP) address the reliability of the City's long term water supplies. This includes a description of supply constraints which may impact the supply. Also included is a comparison between the City's supply and demand.

Legal Requirements:

> ***CWC §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.*

7.1 Constraints on Water Sources

Legal Requirements:

> ***CWC §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.*

Given there are a variety of circumstances that can render a source inconsistent, determining the supply reliability for the City is complex because of the intricate factors that accompany a water source. These factors include legal issues, environmental constraints, water quality, and climatic variations.

7.1.1 Legal

The groundwater supplies the City relies upon are not adjudicated. Since the 2015 UWMP, SGMA has become effective and Madera is working collaboratively with other agencies reliant on the groundwater basin to reach sustainable management of the groundwater aquifer prior to 2040, as required. In the 2010 and 2015 UWMPs, the City's groundwater supplies were shown to be increasing with population growth into the future. This trend continues to 2040; however, the total quantity of groundwater needed is less than forecasted in the 2015 UWMP due to current compliance with SBx7-7 and upcoming compliance with AB 1668 and SB 606.

Should new legal requirements or basin adjudication come into effect prior to the 2025 UWMP Update, the City will endeavor to understand and comply with those regulations as they are written and provide documentation of those efforts in the 2025 UWMP Update.

7.1.2 Environmental

The status of environmental regulation in California is routinely changing due to new legislation, endangered species statuses, and other factors. Should new environmental legislation come into existence it could potentially reduce the City's available supply. The recent water supply reductions in the Delta are an example of environmental water needs versus community water supplies. Due to the reliance on groundwater within the City, it would be difficult to make rapid alterations to the water supply to accommodate these changes, should they occur. The City will continue to monitor environmental regulations for impacts to the City's system.

7.1.3 Water Quality

The regulatory and legal requirements pertaining to water quality are frequently changing in the State of California due to revisions to existing or introduction of new Maximum Contaminant Levels (MCLs) for various primary and secondary constituents throughout the State. Trichloropropane, dibromochloropropane, nitrate, manganese, and arsenic are the primary constituents of concern throughout the Subbasin, and the City will continue to monitor those and any new constituents, if needed, to remain in compliance with regulations and reporting requirements. The system is currently in compliance with all water quality regulations.

7.1.4 Climatic Factor

As climate change becomes more quantifiable and potentially affects the local water conditions more, alterations in the water supply planning arena will have to take place. Climate change elements such as drought, more rainfall and less snow in the watershed, or massive flooding could potentially affect supply reliability, therefore requiring the City to make modifications to their water supplies.

The climate change impacts on groundwater should be less impactful to overall water management strategies, as the City is already positioning to respond to SGMA and achieve groundwater sustainability by 2040. Without groundwater sustainability achieved, groundwater levels could continue to decline, impacting the overall access and amount of groundwater in the aquifer.

The City will continue to monitor impacts to the water supply as a result of climate change and other factors and is poised to respond through adaptation strategies, primarily, if needed. Adaptation can consist of water conservation methods, more extensive master planning, acquisition of surface water supplies for recharge or potable uses, increased usage of recycled water, and investment in infrastructure to support the previously stated measures.

7.2 Reliability by Type Year

This section considers the City's water supply reliability during three water scenarios: normal year, single-dry year, and multiple-dry year period.

7.2.1 Types of Years

The reliability scenarios to be considered are defined as follows:

- ***Average year****: This condition represents the water supplies a Supplier 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. In the 2020 UWMP Guidebook, DWR uses the terms average and normal interchangeably when addressing the water year type.*
- ***Single-dry year:*** *the year that represents the lowest water supply available to the City. Generally considered to be the lowest annual runoff for a watershed since the water-year beginning in 1903. Suppliers should determine this for each watershed from which they receive supplies.*
- ***Multiple-dry year period:*** *the period that represents the lowest average water supply available to the City for a consecutive multiple year period. Generally considered to be the lowest average runoff for a consecutive multiple year period (five years or more).*

Table 7-1 summarizes the base years for the average, single and multi-dry year periods. In addition, the available supply volume and percent relative to the normal/average year is listed. As shown, the representative normal year is 1992, while 2013 represents the lowest supply year (single dry year). **Table 7-1** reflects the more recent 2012 through 2016 drought since accurate water supply records were available.

The City water supply has historically been very consistent, due in large part to the reliability of the groundwater aquifer, and it is anticipated this will continue into the future. However, as SGMA is further implemented, it is possible that there will be further restrictions on groundwater pumping especially in critical dry and multiple dry years.

Table 7-1: Bases of Water Year Data (Submittal Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats		
			Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.	
		X	Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
			Volume Applied (AF)	Percent of Average Supply
Normal/Average Year	2002		11,868	100%
Single-Dry Year	2013		11,327	95%
Multiple-Dry Year	2012		10,635	90%
Multiple-Dry Year	2013		9,313	78%
Multiple-Dry Year	2014		9,203	78%
Multiple-Dry Year	2015		9,088	77%
Multiple-Dry Year	2016		8,393	71%

7.3 Supply and Demand Comparison

Legal Requirements:

CWC §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 total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry 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.

7.3.1 Reliability – Normal Year

The projected normal water year supplies and demand from 2025 through 2040 are presented in **Table 7-2**.

Table 7-2: Normal Year Supply and Demand Comparison (Submittal Table 7-2)

	2025	2030	2035	2040
Supply Totals	14,870	14,694	15,520	16,392
Demand Totals	14,870	14,694	15,520	16,392
Difference	**0**	**0**	**0**	**0**

Units: AF

As shown, demands are expected to correlate directly with projected population estimates from 2025 to 2040 and supply is projected match demands, as discussed in previous sections. The supply to customers will be provided solely by groundwater sources and won't show any excess or deficiency.

7.3.2 Reliability – Single Dry Year

The single dry water year will be largely unaffected by dry weather conditions, due to the City's reliance on groundwater. This projection does not take into account possible state-wide mandates for conservation beyond that required by SBx7-7, groundwater pumping restrictions that may arise from SGMA, or any possible future adjudication of the basin. The single-dry year supply and demand are shown in **Table 7-3**.

Table 7-3: Single-Dry Year Supply and Demand Comparison (Submittal Table 7-3)

	2025	2030	2035	2040
Supply Totals	14,870	14,694	15,520	16,392
Demand Totals	14,870	14,694	15,520	16,392
Difference	**0**	**0**	**0**	**0**

Units: AF

7.3.3 Reliability – Five Consecutive Dry Years

The projected multiple-dry year supply and demand from 2025 through 2040 is presented in **Table 7-4**. It is anticipated State-wide conservation mandates would be required during a prolonged drought; however, the magnitude of those mandates is unknown, and supplies would be available from the aquifer to meet the demands, even if demands were reduced based on mandated conservation requirements.

Table 7-4: Multiple-Dry Year Supply and Demand Comparison (Submittal Table 7-4)

		2025	2030	2035	2040
First Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Second Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Third Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**

7.3.4 Description of Management Tools and Options

Legal Requirements:

CWC §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.*

7.3.4.1 Groundwater Reliability

The City's wells currently draw water from a non-adjudicated groundwater basin (Madera Subbasin) with no current limits on pumping and that has been labeled as being in a critical state of overdraft. Therefore, reliability of the groundwater supply will depend on the long-term balance between groundwater extraction and recharge for the Subbasin, as a whole, as discussed in previous sections.

To minimize its contribution to groundwater depletion, sustainable use of groundwater supply sources is a primary focus of the City's urban water management activities extending into the future. The City engages in groundwater recharge activities when surface water supplies are available to replenish the water table and will continue to look for ways to expand those recharge activities, including an exchange agreement for their treated wastewater effluent impacts.

7.3.4.2 Surface Water Reliability

The City does not rely on surface water therefore this section does not apply.

7.3.4.3 Recycled Water Reliability

The City does not recycle water therefore this section does not apply.

7.4 Drought Risk Assessment

Legal Requirements:

CWC §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.

7.4.1 DRA Data, Methods, and Basis for Water Shortage Conditions

The Drought Risk Assessment (DRA) for the City has been prepared based on the next five years' (2021-2025) supplies and demands and the supply impacts seen during the 2012-2016 drought period. This requires the City to evaluate whether they can accommodate another historic drought if it were to begin in 2021.

7.4.1.1 Water Use

The water use values are a projection between the actual water use in 2020 and the projected water use in 2025, shown in DWR Submittal Table 4-2. This linear projection does not account for conservation or other demand reductions, beginning in 2021 and culminating in 2025.

7.4.1.2 Water Supply

The water supply value considers the City's only supply source, groundwater. For purposes of the DRA, the groundwater quantity available is equal to the total active well supply capacity of 19,692gpm (31,763 AFY).

7.4.1.3 Water Shortage Conditions

The DRA assumes to utilize the same levels discussed in the WSCP and the related use reduction benefit is shown in the table below. The reductions range from 0 to 30 percent, depending on the year, similar to the 2012-2016 drought conditions. As the City is currently maintaining a lower water use per capita, the mandatory 36 percent conservation goal enforced by the State several years ago is not anticipated unless the drought conditions are worse than those in 2015, which is not what the DRA contemplates.

7.4.2 Individual Water Source Reliability

Groundwater is considered a very reliable water supply. For purposes of the immediate five-year DRA, the City will consider the groundwater supplies to be available to match demands; however, it is understood there could be mandated conservation during a prolonged drought, similar to those instituted in 2015. In that instance, the City would utilize methods discussed in the Water Shortage Contingency Plan to reduce system demands. For longer term planning purposes, the City will pursue other options to increase recharge, such as instituting permanent mandatory conservation measures to reduce demand.

7.4.3 Total Water Supply and Use Comparison

The following comparison is completed on an annual basis rather than a monthly or quarterly basis as the City's highest demands are in the summer. **Table 7-5** summarized the supply and demand comparison along with impacts due to planned WSCP actions.

Table 7-5: Five-Year Drought Risk Assessment (Submittal Table 7-5)

Year	Without WSCP Actions			Planned WSCP Actions			
	Total Water Use	Total Supplies	Surplus/ Shortfall w/o WSCP Action	Supply augmentation benefit	Use reduction savings benefit	Revised Surplus/ (shortfall)	Resulting % Use Reduction from WSCP action
2021	9,977	9,977	0	0	1,037	1,037	10%
2022	11,201	11,201	0	0	2,240	2,240	20%
2023	12,424	12,424	0	0	2,485	2,485	20%
2024	13,647	13,647	0	0	3,412	3,412	25%
2025	14,870	14,870	0	0	4,461	4,461	30%

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8 Water Shortage Contingency Planning

Legal Requirements:

CWC §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.

The Urban Water Management Planning Act (UWMPA) requires that the Urban Water Management Plan (UWMP) include an urban water shortage contingency analysis that addresses stages of action to be undertaken by the urban water supplier in response to water supply shortages, including more than a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage. In addition to the stages of action, the City is required to develop mandatory prohibitions against specific water use during shortages and consumption reduction methods in the most restrictive stages.

The City's Water Shortage Contingency Plan (WSCP) is an independent document from the UWMP and can be found in **Appendix E**.

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9 Demand Management Measures

This section provides a comprehensive description of the water conservation programs that the City of Madera (City) has implemented, is currently implementing, and plans to implement in order to meet its urban water use reduction targets.

9.1 Demand Management Measures

Legal Requirements:

CWC §10631

(f)(A)…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 Urban Water Management Planning Act (UWMPA) requires urban water suppliers provide information regarding water conservation and DMMs compliance; this Section provides that information. The UWMPA was amended in 2014 to streamline DMMs from 14 specific measures to six more general requirements and an "other" category.

The City has a water conservation program in place. The City takes water conservation very seriously and considers implementation of Demand Management Measurements (DMMs) as a necessity to achieve the goals of the conservation program.

9.1.1 Water Waste Prevention Ordinance

The City's Water Shortage Contingency Plan (see **Appendix E**) identifies penalties for water waste or violating current drought regulations. The water waste ordinances can also be found in the Madera Municipal Code, Title 5, Chapter 5. The penalties associated with each stage of a water shortage, as modified in 2017, are provided below.

- *Violation 1 - $75 surcharge on next water bill*
- *Violation 2 - $200 surcharge on next water bill*
- *Violation 3 - $500 surcharge on next water bill*

Further details on prohibitions and penalties are explored in Chapter 8, the Water Shortage Contingency Planning.

9.1.2 Metering

Legal Requirements:

CWC §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.

CWC §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.

In compliance with State law, the City has nearly completed the process of placing meters on all customer water connections. As of the end of 2015, nearly 97% of the customer connections are metered. The City is expecting to be fully metered in the near future. The City adopted a new rate structure in 2015 that includes commodity rates for metered connections (see Section on Conservation Pricing below). The City's current rate structure is included in **Appendix F**.

9.1.3 Conservation Pricing

In 2015, the City of Madera prepared the City of Madera Utility Rate Study Report (Raftelis Financial Consultants, Inc., 2015). The major objectives of the study included:

- *Develop financial plans for the water and wastewater enterprises to ensure financial sufficiency, meet operation and maintenance costs, ensure sufficient funding for capital replacement and refurbishment needs, and maintain a strong financial outlook for the enterprises;*
- *Develop sound and sufficient reserve fund targets;*
- *Review current rate structures for the water and wastewater enterprises;*
- *Develop a cost-of-service analysis for the water and wastewater enterprises; and*
- *Develop fair and equitable utility rates.*

The rate structure recommended in the rate study was adopted in 2015. Prior to the new rate structure, customers with meters were charged a monthly fixed rate based on the size of the customers meter, and a variable (volume) charge based on usage. The City also has accounts that are not currently metered, and these accounts are charged a flat monthly fee. Once these accounts are metered, they would be charged the corresponding metered rates.

The new rate structure includes a tiered rate system to promote conservation. The new system is described below:

- *Single-Family Residential (SFR) water rates were modified from a uniform rate to a 3-tiered inclining rate structure. The tiers closely reflect the water demands of residential customers for indoor needs (Tier 1), outdoor needs (Tier 2), and any additional usage above Tiers 1 and 2 (Tier 3).*

- *Multi-Family Residential (MFR) water rates were modified from a uniform rate to a 2-tiered rate structure. Multi-family homes typically have no or low outdoor water usage, so Tier 1 reflects typical indoor usage, and Tier 2 includes usage above Tier 1.*
- *Non-Residential (commercial, industrial, etc.) accounts will remain on a uniform rate.*

Table 9-1: Water User Rates

Category	FYE 2020 Rate (per CCF)
Residential Water Rates	
Tier 1	$1.93
Tier 2	$2.60
Tier 3	$4.22
Multi-residential	
Tier 1	$2.03
Tier 2	$3.32
Non-residential	
Uniform Rate	$2.58

9.1.4 Public Education and Outreach

The City utilizes mass mailings and the City internet site to distribute information to all water service customers. Walk in customers are also provided with information at City Hall and at the Public Works Department Water Division. When called upon to distribute time sensitive notices and information, local print media is also used.

Mass mailings with information on regulations and Consumer Confidence Reports are performed every March. The City also provides additional information on conservation measures at this time. Display cases and public bulletin boards are utilized in the Public Works facility to display information that is mailed out.

The City staffs information booths at the annual Madera District Fair in September. The booths provide pamphlets and flyers with promotional and educational materials as well as updates on regulations and ordinances.

The City monthly water bill distributed to all water service customers also contains information regarding previous year water usage, conservation measures, and other updates.

The City makes staff available for guidance and educational tours of water system facilities. They have also developed a plan to enhance existing school education wherein students tour facilities and receive formal presentations at their schools. The City encourages local educators to include demand management education in their curriculum where appropriate. The City also makes presentations to neighborhood agencies and service clubs.

9.1.5 Programs to Assess and Manage Distribution System Real Loss

The City operates a detection and repair program of its entire water distribution system. In addition, the City's distribution system includes a SCADA system to accurately record production quantities. All of the City's wells are metered; however, as of 2020, about 3% of the City's water connections were not metered, and thus, a complete system water audit is not possible without assuming unmetered water usage. Currently, water main records are maintained in a GIS system. The City has convenient access to historical data on each water main.

Between 2017 – 2019 losses were estimated to range from 4% to about 14%. Water losses were calculated using AWWA Free Water Audit Software. The AWWA spreadsheet and results of the audits are discussed further in **Section 4.2**. The AWWA spreadsheet breaks losses into various categories using assumed default percentages. These categories include unauthorized use (theft), metering inconsistencies, etc. The complete AWWA software spreadsheets can be viewed in **Appendix B**.

9.1.6 Water Conservation Program Coordination and Staffing Support

The City's Water Divisions Operations Manager has also served as the City's Water Conservation Coordinator since 1986. Water Conservation Coordinator duties include interdepartmental coordination, monitoring the practice and application of DMMs, supervision of the Conservation Water Patrol, and planning of community water conservation education projects. As the City's water Conservation efforts have expanded, additional staff have been used to implement water conservation measures. The City is in the process of hiring one full time person to oversee all of the water conservation programs and guide other staff that help with those efforts.

9.1.7 Other Demand Management Measures

The City implements several other DMMs, which are described below.

9.1.7.1 Rebate Programs

The City operates numerous rebate programs to help defer costs for customers and encourage water conservation. Residents should check with the City to determine program qualifications and follow directions listed on the City website. These programs are described below and the number of rebates for each shown in **Table 9-2**.

Table 9-2: Rebate Program Implementation

Rebate Program	Rebates Distributed [1]					
	FY15/16	FY16/17	FY17/18	FY18/19	FY19/20	FY19/20
Turf Replacement	$22,244 (44)	$21,769 (34)	$97,530 (59)	$85,951 (48)	$87,245 (55)	$76,551(45)
High Efficiency Toilet Replacement	$1,300 (21)	$4,100 (29)	$12,617 (62)	$14,235 (59)	$15,232 (76)	$11,172 (53)
High Efficiency Dishwasher Replacement	$455 (13)	$975 (11)	$4,000 (23)	$3,800 (21)	$5,200 (26)	$5,200 (26)
High Efficiency Clothes Washer Replacement	$500 (11)	$2,275 (22)	$3,325 (27)	$1,000 (4)	$2,200 (11)	$3,800 (19)
Smart Irrigation Controller Replacement	$200 (2)	$279 (2)	$1,763 (11)	$1,703 (13)	$935 (5)	$2,072 (18)
Drip Irrigation Kit and Irrigation Timer	$270 (6)	$142 (5)	$872 (14)	$730 (9)	$534 (4)	$475 (6)
Mulch Installation	$46 (9)	$451 (12)	$1,477 (18)	$1,733 (18)	$1,976 (20)	$1,980 (19)
Hose Bib Faucet Lock	-	$40 (2)	$48 (2)	$138 (4)	$19 (1)	$30 (1)
Rainwater Harvest	-	-	$439 (3)	-	-	-
Totals	**$25,015 (106)**	**$30,031 (117)**	**$122,071 (219)**	**$109,290 (176)**	**$113,341 (198)**	**$101,281 (187)**

Notes:
[1] Number of rebates are shown in parenthesis behind the total dollars distributed for each category and fiscal year (FY).

9.1.7.1.1 Turf Replacement Rebate Program

The City will pay customers $2.00 per square foot to remove up to 1,000 square feet of irrigated turf for drought tolerant landscape. The City will pay customers $3.00 per square foot to remove up to 1,000 square feet of irrigated turf for artificial turf. Turf grass at homes and commercial landscapes consume large amounts of water. Water-efficient landscapes use 50% or less water than most turf. The amount saved depends on the amount of turf removed, type of plants installed, irrigation system, and soil type. A water-efficient landscape can use less water and may not require expensive maintenance.

9.1.7.1.2 High Efficiency Toilet Replacement Rebate Program

Residential customers may be eligible for a rebate when they replace their old high water use toilets with a new qualifying High Efficiency (HE) Toilet providing 1.28 gallons per flush (gpf) or less. Installing an HE toilet can save about 38 gallons of water per day for a family of four. All qualifying toilets must have a WaterSense label. The City is offering a rebate of $100 for qualifying toilet replacements and up to $100 for installation costs.

9.1.7.1.3 High Efficiency Dishwasher Replacement Rebate Program

City residents may apply to receive a credit of $200 to their utility service account for purchasing a high efficiency (HE) dishwasher. HE dishwashers can save 2 gallons of water per load of dishes. They can also help reduce energy bills (gas or electric) due to reduced requirements for heated water. HE dishwashers must be Energy Star rated.

9.1.7.1.4 High Efficiency Clothes Washer Residential Replacement Rebate Program

City residents may apply to receive a $200 rebate following the purchase of a qualifying High Efficiency Clothes Washer (HECW). An HECW can save up to 22 gallons of water per load. HECWs also have a higher load capacity reducing the number of loads required per household. HECWs are more energy efficient than standard washing machines reducing power bills and requiring less heated water, which will save on gas or electric depending on the customers' water heater fuel source. Residents should check with the City to see which models qualify for the rebate. Only non-HECWs can be replaced using this program and the HECW must remain in the home for 36 months.

9.1.7.1.5 Smart Irrigation Controller Replacement Program

The City is offering a $200 rebate for the purchase of an EPA WaterSense certified smart irrigation controller. Smart irrigation controllers automatically adjust their watering schedule according to the weather conditions to provide optimal moisture for healthy plants and lawns. Smart irrigation controllers purchased must be capable to be set for the City of Madera's scheduled water days. A pre-installation audit of your current irrigation system by City staff may be required.

9.1.7.1.6 Drip Irrigation Kit and Irrigation Timer Rebate

City residents may apply to receive a credit of $150 for drip irrigation kits and up to $50 rebate for irrigation timers. Drip irrigation eliminates over-watering problems by applying water only where and when it is needed, with less runoff and less evaporation from leaves and soil. The uniform application of water from drip irrigation systems can achieve high water savings. The conversion can save up to 9 gallons of water annually for each square foot of irrigated area converted. Irrigation timers turn a hose faucet into a programmed system and automatic watering scheduling. They help conserve water by providing a consistent watering schedule and help to avoid over-watering.

9.1.7.1.7 Mulch Rebate Program

The City provides a mulch rebate program for its customers. According to SaveOurWater.com 20-30 gallons of water can be saved per 1,000 square feet of mulch. Good mulch conserves water by significantly reducing moisture evaporation from the soil. It also reduces weed populations, prevents soil compaction, and keeps soil temperatures more moderate. The mulch rebate allows for a maximum of $100 per City of Madera utility customer and an additional $75 for delivery.

9.1.7.1.8 Faucet Locks

The City is offering a rebate of up to $20 for the installation of a qualifying faucet lock.

9.1.7.1.9 Rainwater Harvest

The City is offering a rebate of $400 for the installation of a qualifying rainwater harvester.

9.1.7.2 Residential Plumbing Retrofit

While new construction requires low-flow water fixtures, there is no requirement to retrofit existing plumbing fixtures with low-flow water fixtures. The City's plan does mandate appropriate retrofitting of low-flow fixtures during remodeling.

As a part of its public information program, the City distributes educational material describing the importance of plumbing retrofits as an integral part of water conservation. Several studies suggest that water use savings resulting from miscellaneous interior retrofit fixtures can range between 25 and 65 gpd 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 lesser savings per housing unit

9.1.7.3 Commercial, Industrial, and Institutional Conservation Programs

Commercial, Industrial, and Institutional (CII) accounts that have large landscape usage can get landscape water audits from the City upon request. Audits include reviewing water usage history with the customer, identifying leaks in the customer's system, and recommending improvements.

Another program which the City makes available to commercial, industrial, and institutional accounts is the Conservation Water Patrol. This group has the responsibility to educate commercial and industrial users that overuse water for irrigation purposes. The patrol can provide a variety of resources to help a commercial or industrial consumer conserve, including staff expertise, written materials, and the City's demonstration water conservation garden.

9.2 Implementation Over the Past Five Years

Section 9.1 discusses the implementation over the previous five years for each DMM, providing statistics on implementation where applicable and available. Overall, the DMMs continue to increase public awareness towards water conservation by providing rebates, educational programs, and water surveys.

9.3 Planned Implementation to Achieve Water Use Targets

The City has implemented the recommended DMMs cited in the California Water Code 10631 (e)(1)(B) and will continue to do so in the future. The City has met their 2020 target of 169 gpcd with an actual water use of 119 gpcd in 2020.

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10 Plan Adoption, Submittal, and Implementation

The City has prepared this 2020 Urban Water Management Plan (UWMP), as required by the UWMPA. This section documents plan adoption, submittal, and implementation of the 2020 UWMP. A completed UWMP checklist will be included in **Appendix G** of the Final UWMP.

10.1 Inclusion of All 2020 Data

The 2020 UWMP includes the water use and planning data for the calendar year of 2020. The City is reporting on a calendar year basis and therefore, 2020 data includes the months of January to December 2020.

10.2 Notice of Public Hearing

Prior to adoption of the 2020 UWMP, a public hearing was held and notices were provided to the public. The public hearing provided an opportunity for the public to provide input to the plan before it is adopted. Additionally, the public hearing provided an opportunity for the City's customers, residents, and employees to learn and ask questions about the current and future water supply of the City.

10.2.1 Notice

Legal Requirements:

CWC §10631

(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 §10642

…The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area…

The City has provided formal written notification to the County of Madera and the Madera Irrigation District that the City's UWMP was being updated for 2020. As shown in **Table 10-1**, this notification was provided to the County of Madera and the Madera Irrigation District at least 60 days prior to the public hearing of the plan. Copies of the final UWMP will be provided to these agencies no later than 30 days after its submission to Department of Water Resources (DWR). The notice of public hearing to the public is included in **Appendix A**.

Table 10-1: Notification Letters (Submittal Table 10-1)

Name	60-Day Notice	Notice of Public Hearing
County of Madera	X	X
Madera Irrigation District	X	X

10.2.2 Notice to Public

Legal Requirements:

CWC §10642

…Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection…Prior to the hearing, notice of the time and place of 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 §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 City is committed to encouraging the active involvement of diverse social, cultural, and economic elements of its citizenry. On July 6, 2022 and July 13, 2022, the City placed a notice in the Madera Tribune stating that its UWMP was being updated and that a public hearing would be conducted to take testimony from members of the community. The Draft 2020 UWMP was made available for public inspection at the City of Madera Public Works office, located at 1030 S. Gateway, Madera, California. The notice of public hearing to the public is included in **Appendix A**.

10.3 Public Hearing and Adoption

10.3.1 Public Hearing

Legal Requirements:

CWC §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.

CWC §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.

The public hearing was held prior to the adoption of the UWMP and was adopted as prepared. The hearing provided an opportunity for the City's customers, residents, and employees to learn and ask questions about the current and future water supply of the City. _____ comments were provided at the hearing. The public hearing was held on September 21, 2022.

10.3.2 Adoption

Legal Requirements:

> ***CWC §10642***
> *…After the hearing,*
> *the plan shall be adopted as prepared or as modified after the hearing.*

The plan adoption by City Council occurred after a public hearing on September 21, 2022. The City Adoption Resolution is included in **Appendix H**.

10.4 Plan Submittal

Legal Requirements:

> ***CWC §10621***
> *(e) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021…*
> ***CWC §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.*
> ***CWC §10635***
> *(b) 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 following section outlines the submittal of the 2020 UWMP to DWR, the State Library, and Cities and Counties.

10.4.1 Submitting an UWMP and WSCP

The 2020 UWMP and WSCP will be submitted to the following agencies and stakeholders within 30 days of adoption, in the format noted, as required.

- *Department of Water Resources (electronically)*
- *California State Library (compact disk)*
- *County of Madera (electronically)*
- *Madera Irrigation District (electronically)*

10.4.2 Electronic Data Submittal

Legal Requirements:

> ***CWC §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.*

The 2020 UWMP, WSCP and tabular data will be submitted electronically using the Water Use Efficiency (WUE) data online submittal tool developed by DWR.

10.5 Public Availability

Legal Requirements:

CWC §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 of submitting the UWMP and WSCP to DWR, the adopted plans will be available for public review during normal business hours at the City of Madera Public Works office. The City will also post a copy of the adopted UWMP and WSCP on its website (https://www.madera.gov/).

10.6 Amending an Adopted UWMP or WSCP

Legal Requirements:

CWC §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).

CWC §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 plan may be updated at any time when the urban water supplier believes significant changes have occurred in population, land use, and/or water sources that may affect the contents of the plan. If major changes are made to this 2020 UWMP, the City will hold an additional public hearing and City Council will readopt the plan. Copies of amendments or changes to the plan shall be submitted to DWR, the California State Library, Madera Irrigation District, and Madera County within 30 days of adoption.

11 References

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DOF, Department of Finance. (2021, September 2). Retrieved from E-4 Population Estimates for Cities, Counties and the State, 2010 - 2020: www.dof.ca.gov/Forecasting/Demographics/Projections/

DWR, Department of Water Resources. (2003). California's Groundwater, Bulletin 118 (Update 2003).

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Raftelis Financial Consultants, Inc. (2015). City of Madera Utility Rate Study Report.

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Appendices

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Appendix A
Outreach Documents

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Proof of Publication

(2015.5 C.C.P.)

The Madera Tribune
P.O. Box 269
Madera, Ca 93639
Ph: 559-674-2424
legals@maderatribune.net

PUBLIC NOTICE

PROVOST & PRITCHARD CONSULTING GROUP

REF. NO. 5146

STATE OF CALIFORNIA)
) ss.
County of Madera)

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the Madera Tribune, a newspaper of general circulation, published in the City of Madera, County of Madera, and which newspaper has been adjudged a newspaper of General circulation by the Superior Court of the County of Madera, State of California, under the date of November 9, 1966, Case Number 4875 that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

PUBLISHED ON: JULY 6, 13, 2022

I certify or declare under penalty of perjury that the foregoing is true and correct.

Dated:
This Day 13 of July, 2022

Signature Christy Lopez

Notice is hereby given that a public hearing will be held to take testimony on and consider adoption of the City of Madera 2020 Urban Water Management Plan and Water Shortage Contingency Plan, as required by the California Water Code section 10642 and 10608. Copies of the 2020 Urban Water Management Plan and Water Shortage Contingency Plan are available to the public for inspection at 1030 South Gateway, Madera, CA 93637. The public hearing will be conducted on September 21, 2022, at 6:00pm, at the Council Chambers in City Hall at 205 W. 4th Street, Madera, CA 93637.

No. 5146 -July 6, 13, 2022

August 6, 2021

Thomas Greci, General Manager
Madera Irrigation District
12152 Road 28 1/4
Madera, CA 93637

Dear Mr. Greci,

In accordance with the Urban Water Management Planning Act, California Water Code §10621(b), the City of Madera is notifying the Madera Irrigation District that the City will be reviewing its UWMP and considering amendments or changes to the Plan. Madera's last UWMP was updated and adopted April 2017.

Once a draft is ready for review, it will be sent to your attention electronically and we would be pleased to receive any comments you may have on this update to the Plan. If you need to contact me regarding this matter, I may be reached at (559) 662-4951 or agonzales1@madera.gov.

Sincerely,

Adam M. Gonzales
Administrative Analyst

Department of Public Works
1030 South Gateway Drive • Madera, CA 93637 • TEL (559) 661-5466 • FAX (559) 661-0760
www.cityofmadera.ca.gov

August 6, 2021

Matt Treber, Director
County of Madera
200 W 4th Street
Madera, CA 93637

Dear Mr. Treber,

In accordance with the Urban Water Management Planning Act, California Water Code §10621(b), the City of Madera is notifying the County of Madera that the City will be reviewing its UWMP and considering amendments or changes to the Plan. Madera's last UWMP was updated and adopted April 2017.

Once a draft is ready for review, it will be sent to your attention electronically and we would be pleased to receive any comments you may have on this update to the Plan. If you need to contact me regarding this matter, I may be reached at (559) 662-4951 or agonzales1@madera.gov.

Sincerely,

Adam M. Gonzales
Administrative Analyst

Department of Public Works
1030 South Gateway Drive • Madera, CA 93637 • TEL (559) 661-5466 • FAX (559) 661-0760
www.cityofmadera.ca.gov

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Appendix B
Water Loss Audits

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AWWA Free Water Audit Software:
Reporting Worksheet

WAS
American Water Works Association.

Click to access
Click to add a

Water Audit Report for: City of Madera (2010002)
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

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.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

				Pcnt:	Value:	
Volume from own sources:	5	2,977.044	MG/Yr	3		MG/Yr
Water imported:	n/a	0.000	MG/Yr			MG/Yr
Water exported:	n/a	0.000	MG/Yr			MG/Yr

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

WATER SUPPLIED: 2,977.044 MG/Yr

AUTHORIZED CONSUMPTION

Click here: for help using option buttons below

				Pcnt:	Value:	
Billed metered:	7	2,416.392	MG/Yr			
Billed unmetered:	8	107.712	MG/Yr			
Unbilled metered:	1	6.041	MG/Yr			
Unbilled unmetered:		37.213	MG/Yr	1.25%		MG/Yr

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

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 2,567.358 MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption) 409.686 MG/Yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		7.443	MG/Yr	0.25%		MG/Yr

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

Customer metering inaccuracies:	3	239.581	MG/Yr	9.00%		MG/Yr
Systematic data handling errors:		6.041	MG/Yr	0.25%		MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 253.065 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 156.621 MG/Yr

WATER LOSSES: 409.686 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 452.940 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	8	203.0	miles
Number of active AND inactive service connections:	5	14,209	
Service connection density:		70	conn./mile main

Are customer meters typically located at the curbstop 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:	8	53.5	psi

COST DATA

Total annual cost of operating water system:	7	$8,177,058	$/Year
Customer retail unit cost (applied to Apparent Losses):	8	$1.55	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	1		$/Million gallo Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 52 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: Unbilled metered
3: Variable production cost (applied to Real Losses)

AWWA Free Water Audit Software:
Reporting Worksheet

WAS
American Water Works Association.

Click to access
Click to add a

Water Audit Report for: City of Madera (2010002)
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

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.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	8	2,735.023	MG/Yr	7	0.50%		MG/Yr
Water imported:			MG/Yr				MG/Yr
Water exported:			MG/Yr				MG/Yr

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

WATER SUPPLIED: 2,721.416 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	7	2,564.056	MG/Yr			
Billed unmetered:	7	21.900	MG/Yr			
Unbilled metered:	1	6.803	MG/Yr			
Unbilled unmetered:		34.018	MG/Yr	1.25%		MG/Yr

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

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 2,626.777 MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption)

94.639 MG/Yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		6.804	MG/Yr	0.25%		MG/Yr

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

Customer metering inaccuracies:	8	0.000	MG/Yr			MG/Yr
Systematic data handling errors:		6.410	MG/Yr	0.25%		MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 13.214 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 81.426 MG/Yr

WATER LOSSES: 94.639 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 135.460 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	3	204.0	miles
Number of active AND inactive service connections:	5	14,232	
Service connection density:		70	conn./mile main

Are customer meters typically located at the curbstop 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: 8 | 54.0 psi

COST DATA

Total annual cost of operating water system:	7	$8,151,270	$/Year
Customer retail unit cost (applied to Apparent Losses):	7	$1.90	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	1		$/Million gallo ☑ 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: Unbilled metered
3: Variable production cost (applied to Real Losses)

AWWA Free Water Audit Software:
Reporting Worksheet

WAS
American Water Works Association.

Click to access
Click to add a

Water Audit Report for: City of Madera (2010002)
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

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.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

				Pcnt:	Value:	
Volume from own sources:	5	2,724.553	MG/Yr	3		MG/Yr
Water imported:			MG/Yr			MG/Yr
Water exported:			MG/Yr			MG/Yr
WATER SUPPLIED:		**2,724.553**	MG/Yr			

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

AUTHORIZED CONSUMPTION

Click here: for help using option buttons below

				Pcnt:	Value:	
Billed metered:	7	2,535.470	MG/Yr			
Billed unmetered:	8	97.310	MG/Yr			
Unbilled metered:	6	6.340	MG/Yr			
Unbilled unmetered:		34.057	MG/Yr	1.25%		MG/Yr

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

AUTHORIZED CONSUMPTION: **2,673.177** MG/Yr

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

51.376 MG/Yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		6.811	MG/Yr	0.25%		MG/Yr

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

Customer metering inaccuracies:	3	0.000	MG/Yr			MG/Yr
Systematic data handling errors:		6.339	MG/Yr	0.25%		MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **13.150** MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **38.226** MG/Yr

WATER LOSSES: **51.376** MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: **91.773** MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	8	204.0	miles
Number of active AND inactive service connections:	5	14,470	
Service connection density:		71	conn./mile main

Are customer meters typically located at the curbstop 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	53.0	psi

COST DATA

Total annual cost of operating water system:	9	$7,095,576	$/Year
Customer retail unit cost (applied to Apparent Losses):	8	$3.96	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	6	$1,688.55	$/Million gallo Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 59 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

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Appendix C
2015 SBx7-7 Compliance Tables

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SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	13,901	Acre Feet
	2008 total volume of delivered recycled water	-	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range[3]	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. *[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

NOTES:

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☑	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	1995	36,557
Year 2	1996	37,753
Year 3	1997	39,276
Year 4	1998	40,518
Year 5	1999	41,424
Year 6	2000	43,089
Year 7	2001	44,565
Year 8	2002	46,066
Year 9	2003	47,939
Year 10	2004	49,691
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	47,939
Year 2	2004	49,691
Year 3	2005	51,735
Year 4	2006	53,928
Year 5	2007	57,181
2015 Compliance Year Population		
2015		64,810
NOTES:		

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1995	10,306			-		-	10,306
Year 2	1996	11,314			-		-	11,314
Year 3	1997	11,650			-		-	11,650
Year 4	1998	10,888			-		-	10,888
Year 5	1999	12,156			-		-	12,156
Year 6	2000	11,834			-		-	11,834
Year 7	2001	11,210			-		-	11,210
Year 8	2002	11,869			-		-	11,869
Year 9	2003	12,474			-		-	12,474
Year 10	2004	12,887			-		-	12,887
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**11,659**
5 Year Baseline - Gross Water Use								
Year 1	2003	12,474			-		-	12,474
Year 2	2004	12,887			-		-	12,887
Year 3	2005	12,819			-		-	12,819
Year 4	2006	13,166			-		-	13,166
Year 5	2007	14,050			-		-	14,050
5 year baseline average gross water use								**13,079**
2015 Compliance Year - Gross Water Use								
2015		9,314	-		-		-	**9,314**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES: Exludes direct raw water deliveries to La Paloma Powerplant

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	City Groundwater
This water source is:	
☑	The supplier's own water source
☐	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	10,306		10,306
Year 2	1996	11,314		11,314
Year 3	1997	11,650		11,650
Year 4	1998	10,888		10,888
Year 5	1999	12,156		12,156
Year 6	2000	11,834		11,834
Year 7	2001	11,210		11,210
Year 8	2002	11,869		11,869
Year 9	2003	12,474		12,474
Year 10	2004	12,887		12,887
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2003	12,474		12,474
Year 2	2004	12,887		12,887
Year 3	2005	12,819		12,819
Year 4	2006	13,166		13,166
Year 5	2007	14,050		14,050
2015 Compliance Year - Water into Distribution System				
2015		9,314		9,314

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	36,557	10,306	252
Year 2	1996	37,753	11,314	268
Year 3	1997	39,276	11,650	265
Year 4	1998	40,518	10,888	240
Year 5	1999	41,424	12,156	262
Year 6	2000	43,089	11,834	245
Year 7	2001	44,565	11,210	225
Year 8	2002	46,066	11,869	230
Year 9	2003	47,939	12,474	232
Year 10	2004	49,691	12,887	232
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**245**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	47,939	12,474	232
Year 2	2004	49,691	12,887	232
Year 3	2005	51,735	12,819	221
Year 4	2006	53,928	13,166	218
Year 5	2007	57,181	14,050	219
5 Year Average Baseline GPCD				**224**
2015 Compliance Year GPCD				
2015		64,810	9,314	**128**
NOTES:				

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	245
5 Year Baseline GPCD	224
2015 Compliance Year GPCD	128
NOTES:	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
245	**196**
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
224	213	196	**196**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

NOTES:

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
196	245	**220**
NOTES:		

SB X7-7 Table 9: 2015 Compliance								
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(in GPCD)* Enter "0" if Adjustment Not Used			TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
		Extraordinary Events	Weather Normalization	Economic Adjustment				
128	220	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	-	128	128	**YES**
NOTES:								

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Appendix D
2020 SBx7-7 Compliance Tables

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SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**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)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
		2020 Deductions					
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**Exported Water ***	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	**2020 Gross Water Use**
	8,754			-		-	**8,754**
*** 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	Groundwater Wells
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	8,754	-	8,754

[1] ***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.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
8,754	65,526	**119**
NOTES:		

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD (Enter "0" if Adjustment Not Used)			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
119	-	-	-	-	119	196	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

Appendix E
Water Shortage Contingency Plan

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Appendix F
City Ordinances

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RESOLUTION NO: 15-156

Resolution of the City Council of the City of Madera Establishing Monthly Rates To Be Charged For Water Furnished By the City and Repealing Resolution 10-118 and All Other Resolutions In Conflict Herewith

WHEREAS, the City of Madera previously adopted Resolution 10-118 establishing rates for water furnished by the City for the period between July of 2010 and July of 2015; and

WHEREAS, the City of Madera desired to establish water rates which were based on the actual and projected costs of providing services between July of 2015 and July of 2020; and

WHEREAS, the City Council considered a Cost of Service analysis prepared by Raftelis Financial Consultants, a firm with expertise in the analysis of municipal water and sewer utility costs; and

WHEREAS, the Council has caused notices to be sent to all affected customers and property owners regarding the proposal to amend the rates for water use at least 45 days in advance of a noticed public hearing held on July 15, 2015; and

WHEREAS, the Council finds that no majority protest was presented against the proposed rates for water service before or during the public hearing and finds that the proposed rates shall be made effective July 26, 2015.

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF MADERA HEREBY finds, orders and resolves as follows:

1. The above recitals are true and correct.

2. No majority protest was presented against the proposed rates for water service.

3. The monthly rates to be charged for the use of water furnished by the City, enumerated in Attachment A to this Resolution, are hereby adopted.

4. Resolution 10-118, and all other resolutions in conflict herewith, are hereby repealed.

5. This resolution is effective immediately upon adoption.

* * * * * * *

PASSED AND ADOPTED by the City Council of the City of Madera this 15th day of July, 2015 by the following vote:

AYES: Council Members Poythress, Oliver, Rigby, Bomprezzi, Medellin, Holley, Robinson.

NOES: None.

ABSTENTIONS: None.

ABSENT: None.

APPROVED:

ROBERT L. POYTHRESS, Mayor

ATTEST:

SONIA ALVAREZ, City Clerk

CITY OF MADERA INCORPORATED March 27, 1907 CALIFORNIA

APPROVED AS TO LEGAL FORM:

BRENT RICHARDSON, City Attorney

Resolution Attachment A

City of Madera Water Rates: Fiscal Year 2016-2020

Residential Tiered Rates [1]	Allotment	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020
Tier 1	0-10	$1.00	$1.33	$1.63	$1.84	$1.93
Tier 2	11-33	$1.52	$1.90	$2.25	$2.50	$2.60
Tier 3	>33	$2.64	$3.20	$3.69	$4.05	$4.22

Multi-Residential Tiered Rates [1]	Allotment	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020
Tier 1	10	$1.06	$1.40	$1.72	$1.93	$2.03
Tier 2	>10	$2.11	$2.53	$2.92	$3.18	$3.32

Non-Residential Rates [1]	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020
Uniform Rate	$1.49	$1.87	$2.22	$2.47	$2.58

Total Monthly Fixed Cost by Meter Size [2]	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020
5/8"	$9.55	$12.41	$14.89	$16.38	$16.88
3/4"	$10.80	$14.04	$16.84	$18.53	$19.09
1"	$13.30	$17.29	$20.74	$22.82	$23.51
1 1/2"	$19.55	$25.41	$30.49	$33.54	$34.56
2"	$27.05	$35.16	$42.19	$46.41	$47.82
3"	$50.80	$66.04	$79.24	$87.17	$89.81
4"	$85.80	$111.54	$133.84	$147.23	$151.69
6"	$169.55	$220.41	$264.49	$290.94	$299.76
8"	$307.05	$399.16	$478.99	$526.89	$542.86

1. Rate per CCF of water usage. CCF is hundred cubic feet (748.05 gallons).

2. Monthly charges per account/meter.

Flat Rate Water Charges	Units	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020
CAR DLR	WATER SERVICE/BLDG/1000	$7.11	$9.24	$11.09	$12.20	$12.57
CAR SERV	WATER SERVICE/BAYS	$4.75	$6.17	$7.40	$8.14	$8.39
DEPT/RET	WATER SERVICE/BLDG/1000	$7.11	$9.24	$11.09	$12.20	$12.57
GAMES	WATER SERVICE/BLDG/1000	$16.51	$21.46	$25.76	$28.33	$29.18
GRANNY	PRIMARY WITH SECONDARY UNIT	$37.97	$49.36	$59.24	$65.16	$67.12
GROC/MOR	WATER SERVICE/BLDG/1000	$7.11	$9.24	$11.09	$12.20	$12.57
HOSP RM	PER BED WATER USE	$5.93	$7.71	$9.25	$10.17	$10.48
HOSP/CON	WATER SERVICE/BEDS	$5.93	$7.71	$9.25	$10.17	$10.48
HOTEL/W	WATER SERVICE/ROOMS	$7.11	$9.24	$11.09	$12.20	$12.57
HOTEL/WO	WATER SERVICE/ROOMS	$5.93	$7.71	$9.25	$10.17	$10.48
LIB/CHUR	WATER SERVICE/SEAT	$0.26	$0.34	$0.41	$0.45	$0.46
LT MFG	WATER SERVICE/BLDG/1000	$3.81	$4.95	$5.94	$6.54	$6.73
MFR/MULT	MFR MULTI ACCT PER PARCEL	$16.03	$20.84	$25.01	$27.51	$28.33
MFR/SING	MFR SINGLE ACCT PER PARCEL	$16.89	$21.95	$26.34	$28.98	$29.85
OPN AIR	WATER SERVICE/SEAT	$0.16	$0.21	$0.25	$0.28	$0.28
PROF BLD	WATER SERVICE/BLDG/1000	$14.14	$18.39	$22.06	$24.27	$25.00
REST IN	WATER SERVICE/SEAT	$1.47	$1.91	$2.29	$2.52	$2.60
REST OUT	WATER SERVICE/BLDG/1000	$14.14	$18.39	$22.06	$24.27	$25.00
SCHOOLS	WATER SERVICE/STUDENTS	$1.13	$1.47	$1.76	$1.94	$2.00
SFR	MINIMUM WATER RATE	$26.46	$34.39	$41.27	$45.40	$46.76
STRP/MAL	WATER SERVICE/BLDG/1000	$11.78	$15.31	$18.37	$20.21	$20.82
WRHSE	WATER SERVICE/BLDG/1000	$1.00	$1.30	$1.56	$1.72	$1.77

RESOLUTION NO. 17-165

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MADERA APPROVING INCREASE IN WATER CONSERVATION REBATES

WHEREAS, The City Council previously adopted water customer rebate programs for water conservation measures; and

WHEREAS, The City has determined that it is prudent to increase the amount of rebates and methods of award for certain water conservation measures; and

WHEREAS, An adequate fund balance is available in the Water Fund budgets to allow for said increase of rebates.

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF MADERA HEREBY finds orders and resolves as follows:

1. The above recitals are true and correct.

2. The City's existing water conservation rebate amounts are increased as shown below.

Water Conservation Rebates	Existing		Proposed	
	Unit	Maximum	Unit	Maximum
Turf Replacement - Drought tolerant	$ 1.00	$ 1,000	$ 2.00	$ 2,000
Turf Replacement - Artificial Turf	$ 1.00	$ 1,000	$ 3.00	$ 3,000
Toilet*	$ 75	$ 225	$ 100	$ 300
Drip System	$ 50	$ 50	$ 150	$ 150
Timer Only	$ 30	$ 30	$ 50	$ 50
Clothes Washer	$ 75	$ 75	$ 200	$ 200
Dish Washer	$ 50	$ 50	$ 200	$ 200
Smart Irrigation Controller	$ 150	$ 150	$ 200	$ 200
Mulch **	$ 50	$ 50	$ 100	$ 100
Rainwater Harvesting Barrel	$ 100	$ 200	$ 200	$ 400
Faucet Lock	$ 20	$ 20	No change	No change
Laundry-to-Landscape Graywater	$ 200	$ 200	No change	No change
Graywater	$ 500	$ 500	No change	No change

* Up to $100 available for installation charges.

** Up to $75 additional rebate available for delivery charges.

3. With concurrence of a property owner, payments of rebates may be made directly to a third party installer or supplier.

4. This resolution is effective and of full force and effect on December 1, 2017.

.....

PASSED AND ADOPTED by the City Council of the City of Madera this 1st day of November, 2017 by the following vote:

AYES: Mayor Medellin, Council Members Foley Gallegos, Rodriguez, Robinson, Oliver, Rigby, Holley.

NOES: None.

ABSTENTIONS: None.

ABSENT: None.

APPROVED:

ANDREW J. MEDELLIN, Mayor

ATTEST:

SONIA ALVAREZ, City Clerk

CITY OF MADERA INCORPORATED March 27, 1907 CALIFORNIA

APPROVED AS TO LEGAL FORM:

BRENT RICHARDSON, City Attorney

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Appendix G
UWMP Checklist

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2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
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	Section 1
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	Executive Summary
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 2.1
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 2.4
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 2.4 Section 10.2 Section 10.3
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	N/A
Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 3.2
Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4
Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.4
Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.5
Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2
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 4.2.3
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 4.2.5
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 4.2.5
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 4.2.3
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 4.3
Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.2.6 Section 4.4
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
Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.1.3

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
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 5.1.3
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 5.1.3
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 5.1.3 Appendix D
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	Section 7.3
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, *including changes in supply due to climate change.*	System Supplies	Section 6.2.10 Section 7.3
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	N/A
Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	N/A
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 6.2.9
Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2.2 Section 6.2.9

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
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	Section 6.2.2.2
Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.2.1
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	N/A
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	Section 6.2.2.1
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	Section 6.2.2.4
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	Section 6.2.9.1
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 6.2.7
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 6.2.5.2
Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2.5.3
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 6.2.5.4

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
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 6.2.5.4
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 6.2.5.5
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 6.2.5.4
Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.2.6
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 6.2.5.2
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 6.2.8
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 6.3
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 7.1.3
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 7.3.4

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
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 7.3
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 7.4
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 7.4.1
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 7.4.2
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 7.4.3
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 7.4.1
Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Section 8, Appendix E
Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix E, Section 2.1

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
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	Appendix E, Section 11
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	Appendix E, Section 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	Appendix E, Section 3.1
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	Appendix E, Section 5.1
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	N/A
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	Appendix E, Section 5.2
Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix E, Section 5.1
Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix E, Section 5.1
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	Appendix E, Section 5.1

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
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	Appendix E, Table 5-1
Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix E, Section 5.5
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	Appendix E, Section 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	Appendix E, Section 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	Appendix E, Section 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	Appendix E, Section 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	Appendix E, Section 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	Appendix E, Section 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	Appendix E, Section 9.1
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	Appendix E, Section 9.2
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	Appendix E, Section 9.3

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
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	Appendix E, Section 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	Appendix E, Section 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	Appendix E, Section 13.3
Section 8.14	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	Appendix E, Section 13.4
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	N/A
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
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	Section 10.2

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
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
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	Section 10.2 Appendix A
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
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 H
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

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
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	N/A
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 10.6

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Appendix H
Adopting Resolution

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Appendix I
DWR Submittal Tables

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Resolution for the Water Shortage Contingency Plan

RESOLUTION NO. 22-_____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MADERA, CALIFORNIA ADOPTING THE CITY'S WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the California Water Code Sections 10620 et seq. require the adoption an Urban Water Management Plan (UWMP); and

WHEREAS, the California Water Code requires 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); and

WHEREAS, the UWMP, which must be filed every five years, must satisfy the requirements of the Urban Water Management Planning Act (UWMPA) of 1983 including amendments that have been made to the Act and other applicable regulations; and

WHEREAS, the City last updated its UWMP in 2017; and

WHEREAS, on March 17, 2021, the City issued a Request for Proposal (RFP) to prepare an UWMP and four proposals were received; and

WHEREAS, on June 2, 2021, the City Council approved a contract with Provost & Pritchard Consulting Group for the preparation of the UWMP; and

WHEREAS, the Urban Water Management Planning Act (UWMPA) requires that the UWMP include an urban water shortage contingency analysis that addresses levels of action to be undertaken by the urban water supplier in response to water supply shortages, including a more than 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage; and

WHEREAS, in addition to the stages of action, the City is required to develop mandatory prohibitions against specific water use during shortages and consumption reduction methods in the most restrictive stages; and

WHEREAS, this Water Shortage Contingency Plan (WSCP) was prepared according to the California Water Code (CWC) Section 10632 and 10635, as set forth in the 2020 Urban Water Management Plan Guidebook for Urban Water Suppliers (UWMP Guidebook) (DWR, 2021); and

WHEREAS, the WSCP is an appendix to the UWMP but is considered a separate plan from the UWMP; and

WHEREAS, the public hearing was held before the City Council on September 21, 2022.

NOW, THEREFORE, THE COUNCIL OF THE CITY OF MADERA hereby resolves, finds, determines and orders as follows:

1. The above recitals are true and correct.

2. The Water Shortage Contingency Plan, a copy of which is on file in the office of the City Clerk, attached hereto and incorporated by reference, is hereby adopted.

3. The Director of Public Works is hereby authorized and directed to file the Water Shortage Contingency Plan with the California Department of Water Resources.

4. This Resolution is effective immediately upon adoption.

* * * * * * * *

Water Shortage Contingency Plan

September 2022

PUBLIC REVIEW DRAFT

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Report Prepared for:

City of Madera

205 W 4th Street
Madera, CA 93637

Contact:

Adam Gonzales
(559) 662-4951

Report Prepared by:

Provost & Pritchard Consulting Group

Heather Bashian, PE
Nick Jacobson, PE

Contact:

Heather Bashian
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Appendices

Abbreviations

AF ..... acre-feet
City ..... City of Madera
CWC..... California Water Code
DPW ..... City of Madera, Department of Public Works
DRA..... Drought Risk Assessment
DWR .....Department of Water Resources
LHMP .....Local Hazard Mitigation Plan
SGMA .....Sustainable Groundwater Management Act
Code ..... City of Madera Code of Ordinances
UWMP ..... Urban Water Management Plan
UWMPA..... Urban Water Management Planning Act
WSCP .....Water Shortage Contingency Plan

Definitions

The following words and phrases whenever used in the Water Shortage Contingency Plan will have the meaning defined in this Section:

City means the City of Madera.

Customer means any person, business, corporation, public or private entity, public or private association, public or private agency, government agency or institution, school district, college, or any other user of water provided by the City of Madera.

Drought will mean any shortage in water supply based upon expected demands that are caused by hydrological, environmental, legislative, judicial actions, or by infrastructure failure.

Normal Water Supply is defined as sufficient water supply to meet the unconstrained water demand of the preceding three years, averaged.

Waste means among other things, violations of the restrictions set forth in this policy at each specific response level.

Water Conservation means the efficient management of water resources for beneficial uses, preventing waste, or accomplishing additional benefits with the same amount of water.

Water will refer to potable water, unless otherwise specified.

WSCP refers to the City of Madera's Water Shortage Contingency Plan contained herein and as readopted or amended from time to time.

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1 Purpose of Plan

Legal Requirements:

CWC §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.*

The Urban Water Management Planning Act (UWMPA) requires that the Urban Water Management Plan (UWMP) include an urban water shortage contingency analysis that addresses levels of action to be undertaken by the urban water supplier in response to water supply shortages, including a more than 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage. In addition to the stages of action, the City of Madera (City) is required to develop mandatory prohibitions against specific water use during shortages and consumption reduction methods in the most restrictive stages.

This Water Shortage Contingency Plan (WSCP) was prepared according to the California Water Code (CWC) Section 10632 and 10635, as set forth in the 2020 Urban Water Management Plan Guidebook for Urban Water Suppliers (UWMP Guidebook) (DWR, 2021) established by the Department of Water Resources (DWR), and includes the requirements listed in **Table 1-1**.

Table 1-1: WSCP Requirements

Topic	WSCP Location
Water Supply Reliability Analysis	Section 2
Annual Assessment Procedures	Section 3
Water Shortage Stages (Levels)	Section 4
Shortage Response Actions	Section 5
Communication Protocols	Section 6
Compliance and Enforcement	Section 7
Legal Authority	Section 8
Financial Consequences of WSCP	Section 9
Monitoring and Reporting	Section 10
WSCP Refinement Procedures	Section 11
Special Water Feature Distinction	Section 12
Plan Adoption, Submittal, and Availability	Section 13

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2 Water Supply Reliability Analysis

Legal Requirements:

§10632(a)(1) *The analysis of water supply reliability conducted pursuant to §10635.*

2.1 Findings Related to Water System Reliability

As discussed in the City's 2020 UWMP (Provost & Pritchard Consulting Group, 2022), the City's groundwater supply is reliable to meet demands. The following are the summary tables of the normal, single-dry, and multiple dry year supply and demand comparisons shown in the 2020 UWMP. As discussed in the UWMP, the groundwater supplies are sufficient to meet demands; therefore, no supply shortage is anticipated during a normal or dry year scenario.

2.1.1 Normal Year Supply and Demand

Table 2-1: Normal Year Supply and Demand Comparison (DWR UWMP Submittal Table 7-2)

	2025	2030	2035	2040
Supply Totals	14,870	14,694	15,520	16,392
Demand Totals	14,870	14,694	15,520	16,392
Difference	**0**	**0**	**0**	**0**

Units: Acre-Feet (AF)

2.1.2 Single Dry Year Supply and Demand

Table 2-2: Single Dry Year Supply and Demand Comparison (DWR UWMP Submittal Table 7-3)

	2025	2030	2035	2040
Supply Totals	14,870	14,694	15,520	16,392
Demand Totals	14,870	14,694	15,520	16,392
Difference	**0**	**0**	**0**	**0**

Units: AF

2.1.3 Multiple Dry Year Supply and Demand

Table 2-3: Multiple Dry Year Supply and Demand Comparison (DWR UWMP Submittal Table 7-4)

		2025	2030	2035	2040
First Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Second Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Third Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	14,870	14,694	15,520	16,392
	Demand Totals	14,870	14,694	15,520	16,392
	Difference	**0**	**0**	**0**	**0**

Units: AF

In dry years, it is anticipated the City may enact various levels of water conservation measures or be mandated to do so by the State of California. In those instances, the demand totals will reduce for various dry years and the supply will match the reduced demand.

2.1.4 Drought Risk Assessment

The Drought Risk Assessment (DRA) for the City has been prepared based on the next five years' (2021-2025) supplies and demands and the supply impacts seen during the 2012-2016 drought period. This requires the City to evaluate whether they can accommodate another historic drought if it were to begin in 2021.

Table 2-4: Five-Year Drought Risk Assessment (DWR UWMP Submittal Table 7-5)

Condition	2021	2022	2023	2024	2025
Total Water Use	9,977	11,201	12,424	13,647	14,870
Total Supplies	9,977	11,201	12,424	13,647	14,870
Surplus/Shortfall w/o WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - supply augmentation benefit	0	0	0	0	0
WSCP - use reduction savings benefit	1,037	2,240	2,485	3,412	4,461
Revised Surplus/(shortfall)	1,037	2,240	2,485	3,412	4,461
Resulting % Use Reduction from WSCP action	10%	20%	20%	25%	30%
Units: AF					

2.2 Key Issues Creating a Shortage Condition

When considering a water system solely dependent on groundwater, the issues creating a shortage condition include aquifer adjudication or limitation, mandated water demand reduction as a result of other supply source shortages throughout the region, or emergency shortages. This plan is not only responsive to drought conditions but to various conditions that could cause a water supply shortage including regulations, water quality changes, or emergency situations. Currently, there are no groundwater pumping restrictions established as part of the Sustainable Groundwater Management Act (SGMA).

The following section identifies potential key issues that could create shortage conditions that the City is actively monitoring.

Groundwater Restrictions, Regulations or Limitations

The groundwater supplies are not withdrawn from a groundwater aquifer that is adjudicated, but that could change and the implementation of SGMA could have an impact on the quantity of water the City can utilize each year. Additionally, if groundwater levels continue to decline, the City's wells could become inoperable due to groundwater elevation, creating a temporary water shortage until the City is able to modify the well or construct a new one. The City has a redundant network of wells, limiting the impact of one or even two wells becoming inoperable for a period.

Groundwater Quality

The quality of the groundwater supply the City relies upon is reasonably consistent. Constituents of concern discussed in the UWMP have not been a significant issue for the City. However, if new regulations are put into place concerning a new constituent or more stringent standards for an existing constituent, one or more groundwater wells could temporarily or permanently be removed from use by the City, thereby potentially necessitating implementation of the WSCP. Additionally, intentional, or

accidental point contamination is also an item of concern that could temporarily impact water supply and may necessitate the implementation of this WSCP.

Emergency Shortage

In the instance the City experiences a natural or manmade disaster, such as an earthquake or fire, one or more wells could be impacted and the implementation of the WSCP could be necessary. The City's well network is designed to account for one or more well disruptions with the other wells providing the redundancy to maintain the City's level of service. The City has additional protections in place to mitigate the impact of disasters and continue to provide potable water supplies to its service area, such as emergency generators; however, if there is an impact to procuring fuel, those protections might also be compromised.

3 Annual Water Supply and Demand Assessment Procedures

Legal Requirements:

> ***CWC §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 Decision Making Process reliability for the current year and one dry year, including all of the following:*
>
> *(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.*

The City's Department of Public Works (DPW) is responsible for reviewing current data and implementing an appropriate water shortage stage in accordance with Madera Code of Ordinances (Code). The DPW's evaluation and determination is to be based on public welfare and safety or to comply to regulatory requirements set forth by the State of California. Recent changes to California's State Water Code have now required that a WSCP be updated to include a total of six progressive stages to be referenced if deemed necessary. Therefore, this plan will reference and expand on the existing Code of Ordinances.

3.1 Data Input and Assessment Methodology

3.1.1 Current Water Demands

Legal Requirements:

> ***§10632(a)(2)(B)(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.*

The following tables summarize the actual and projected water uses for years 2020 through 2040, as discussed in the 2020 UWMP. The projected demands utilize per capita demand estimates and projected population shown in the UWMP, separated by use types.

Table 3-1: Use for Potable and Non-Potable Water (DWR UWMP Submittal Tables 4-1 and 4-2)

Use Type	Actual 2020 Water Use (AF)	Projected Water Use (AF)			
		2025	2030	2035	2040
Single Family	5,214	8,450	8,145	8,603	9,087
Multi-Family	1,553	2,517	2,426	2,563	2,707
Commercial/Institutional	1,282	2,225	2,350	2,482	2,622
Industrial	80	138	146	154	163
Landscape	550	955	1,008	1,065	1,125
Losses	75	585	618	653	689
Total	**8,754**	**14,870**	**14,694**	**15,520**	**16,392**

Table 3-2: Total Water Use (Potable and Non-Potable) (DWR UWMP Submittal Table 4-3)

Demand Use	2020	2025	2030	2035	2040
Potable Water, Raw, Other Non-Potable	8,754	14,870	14,694	15,520	16,392
Recycled Water	0	0	0	0	0
Total Water Demands	**8,754**	**14,870**	**14,694**	**15,520**	**16,392**

Units: AF

3.1.2 Quantification of Water Supply

Legal Requirements:

> ***§10632(a)(2)(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:*
>
> *(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.*
>
> *(v) A description and quantification of each source of water supply.*

The following table provides the projected reasonably available water supply available to the City for five-year increments from 2025 through 2040. The groundwater supply is used to meet City demands; the City will continue to receive raw surface water supplies and use them for intentional recharge. As the raw water supplies are not used within the City's water system, they are not quantified as a supply for use in meeting demands. Recharge is further discussed in the UWMP. However, the City's efforts to recharge surface water and treated wastewater supplies offsets their groundwater extraction and the groundwater supplies are expected to be sustainable.

Table 3-3: Water Supplies (DWR UWMP Submittal Tables 6-8 and 6-9)

Water Supply	Additional Details on Water Supply	2020 Actual Volume Used (AF)	Projected Reasonably Available Water Supply (AF)			
			2025	2030	2035	2040
Groundwater	Madera Subbasin 5-22.06	8,754	14,870	14,694	15,520	16,392
Total		**8,754**	**14,870**	**14,694**	**15,520**	**16,392**

3.1.3 Existing Infrastructure Constraints

Legal Requirements:

> ***§10632(a)(2)*** *The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:*
>
> *(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:*
>
> *(iii) Existing infrastructure capabilities and plausible constraints.*

The City's infrastructure consists of 17 active groundwater wells that are responsible for supplying the City's water supply from the Madera Subbasin; the capacity of the active wells is 19,692 gallons per minute which equates to approximately 31,760 AF per year or nearly double the 2040 projected demands, indicating a supply surplus. Since the City and regional area are growing, although it is projected to be at a slow rate, it is anticipated that growth in infrastructure will be needed in the coming years.

Catastrophic events such as prolonged drought or seismic activity can cause damage to a system's ability to supply water adequately and safely to its end users. This also includes water delivery and use for health and human safety (e.g., fire prevention, medical clinics, etc.). Planning for system failures can include, but is not limited to, the following:

- Maintaining above ground water storage tanks
- Providing back-up power for groundwater pumping (e.g., electric, diesel, propane, etc.)
- Understanding and quantifying system duplication
- Groundwater wells dedicated for emergency use only

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4 Standard Water Shortage Stages

Legal Requirements:

§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.*

The City has a Municipal Water Conservation Ordinance including base-level prohibitions on water waste not associated with a triggering stage as well as six triggering stages (Ordinance 944 C.S., see **Appendix A**). The City's ordinance stages are identified as "Drought Levels A-F" which correlate to the WSCP water shortage Stages 1-6, respectively. The present structure of Ordinance 944 C.S. will be maintained; however, it will be updated with additional conservation measures to correlate with the discussion provided in this WSCP. The most current version of the Ordinance will be utilized in conjunction with this WSCP, in times of water shortage.

The water shortage levels in the WSCP are defined based on the percent reduction in available water supply, or water supply production capacity, when compared to a typical year. Each water shortage level has an accompanying goal for water consumption reduction varying from 10 percent to more than 50 percent as shown in

Table 4-1.

The DPW is responsible for evaluating and declaring a Shortage Stage and reserves the right to do so at any time according to the City's Municipal Code (§5-5.13) (City of Madera, 2020). The DPW staff may declare a Shortage Stage for a variety of reasons including: loss of production capacity due to system failure or power failure, State or local emergency declaration, lowering of groundwater levels, occurrence of water supply contamination, or catastrophic events impacting the water system. Each reason may result in Stages 1 through 6, depending on severity.

Table 4-1: Water Shortage Stages (DWR WSCP Submittal Table 8-1)

Shortage Stage	Percent Supply	Water Supply Condition
1	<10%	Available water production is up to 10% less than the estimated monthly demand.
2	10-20%	Available water production is up to 20% less than the estimated monthly demand.
3	20-30%	Available water production is up to 30% less than the estimated monthly demand.
4	30-40%	Available water production is up to 40% less than the estimated monthly demand.
5	40-50%	Available water production is up to 50% less than the estimated monthly demand.
6	>50%	Available water production is greater than 50% less than the estimated monthly demand.

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5 Shortage Response Actions

5.1 Demand Reduction

Legal Requirements:

§10632(a)(4) *Shortage response actions that align with the defined shortage levels.*

The first step in a demand reduction program is to reduce the strain on the water system during peak demand hours which is part of the City's year-round water conservation efforts. The presently adopted version of City Ordinance 944 C.S. (see **Appendix A**) modifies a portion of Chapter 5-5.13 in the City's Municipal Code to prohibit water waste at all stages and includes other specifics of base conservation including restricted hours of irrigation and ways to encourage minimal methods of watering. This ordinance will be updated following adoption of this WSCP to match the reduction methods described herein. The City also maintains a penalty system with penalties that range from a warning to fines to flow restrictors or discontinuance of service.

The following section provides additional details regarding restrictions imposed by the six water shortage stages implemented during periods of drought or water supply interruption.

Any person found violating any portion of mandatory compliance will be subject to penalties. All persons, customers, and property within the limits of the City shall not commit water waste as identified in the City's Code §5-5.13.

The City continues to strive to implement water conservation measures year-round. As good stewards of the available groundwater supplies and to ensure that groundwater supplies continue to be a reliable source, the City implements several water use reduction measures year-round without a Shortage Stage declaration (base reductions). The base reductions are implemented year-round to ensure that the City's water supply is consistently protected and monitored, and that City Ordinance 944 C.S. is fully implemented. These measures are as listed below.

Wasting water, as determined by the DPW, includes:

- The wasting of water due to damaged or faulty mechanical equipment.
- The discharge of water due to leaking, dripping, or other water wasting from all connections, faucets, hydrants, pipes, outlets, and plumbing fixtures.
- Use of water through any hose, pipe, or other discharge for the purpose of watering gardens, trees, lawns, flowers, or plants or for other irrigation or agricultural purposes without the use of a restricting nozzle or sprinkling device.
- Use of water that allows for water to run or waste from his or her property onto a city street to such an extent that water shall flow in the street gutter excessively beyond the frontage of the property occupied by such person; nor to flow excessively off of the occupied property into the street gutter; nor to continuously fall upon a public right-of-way or adjoining property such as to

significantly contribute to the gutter flow; nor to excessively flow onto, or continuously fall upon, adjoining properties or an alley.

5.1.1 Stage 1: (Up to 10% Reduction of Normal Water Supply)

Stage 1 is a mandatory water shortage reduction stage and correlates to Level A of the City's Ordinance 944 C.S. All actions listed below are in addition to the base reductions unless a stricter restriction applies and is noted.

- All outdoor irrigation shall occur only between the hours of 7 p.m. and 10 a.m. on designated days. Various exceptions exist, as noted in the City's Ordinance.

5.1.2 Stage 2: (Up to 20% Reduction of Normal Water Supply)

Stage 2 is a mandatory shortage reduction stage and correlates to Level B of the City's Municipal Code §5-5.13. All actions listed below are in addition to the previous stages unless a stricter restriction applies and is noted.

- Dwellings or establishments with even-numbered street addresses shall water only on Wednesday, Friday, and Sunday between the hours of 7 p.m. and 10 a.m..
- Dwellings or establishments with odd-numbered street addresses shall water only on Tuesday, Thursday, and Saturday between the hours of 7 p.m. and 10 a.m..
- Monday will be a non-watering day, unless an approved or conditionally approved exemption is on file with the Public Works Department.

5.1.3 Stage 3: (Up to 30% Reduction of Normal Water Supply)

Stage 3 is a mandatory shortage reduction stage and correlates to Level C of the City's Municipal Code §5-5.13. All actions listed below are in addition to the previous stages unless a stricter restriction applies and is noted.

- Dwellings or establishments with even-numbered street addresses shall water only on Wednesday and Sunday between the hours of 7 p.m. and 10 a.m..
- Dwellings or establishments with odd-numbered street addresses shall water only on Tuesday and Saturday between the hours of 7 p.m. and 10 a.m..
- Monday, Thursday, and Friday are non-watering days, unless an approved or conditionally approved exemption is on file with the Public Works Department.
- Water waste patrols will be increased to ensure the above conservation measures are being enforced.

5.1.4 Stage 4: (Up to 40% Reduction of Normal Water Supply)

Stage 4 is a mandatory shortage reduction stage and correlates to Level D of the City's Municipal Code §5-5.13. All actions listed below are in addition to the previous stages unless a stricter restriction applies and is noted.

- Dwellings or establishments with even-numbered street addresses can water landscapes on Sunday only between the hours of 7 p.m. and 10 a.m.
- Dwellings or establishments with odd-numbered street addresses can water landscapes on Saturday only between the hours of 7 p.m. and 10 a.m.
- Monday, Tuesday, Wednesday, Thursday, and Friday are non-watering days, unless an approved or conditionally approved exemption is on file with the Public Works Department.
- Water waste patrols will be increased to ensure the above conservation measures are being enforced.
- System water losses will be evaluated, and steps will be taken to reduce these losses.
- A public information campaign will be implemented to communicate the significance of the measures to the public.
- Drought water rate structures and/or surcharges will be implemented to encourage conservation methods.

5.1.5 Stage 5: (Up to 50% Reduction of Normal Water Supply)

Stage 5 is a mandatory shortage reduction stage and correlates to Level E of the City's Municipal Code §5-5.13. All actions listed below are in addition to the previous stages unless a stricter restriction applies and is noted.

- Dwellings or establishments with even-numbered addresses can use drip-irrigation systems or hand water trees and large shrubs to minimally maintain their viability on Sunday only, between the hours of 7 p.m. and 10 a.m.
- Dwellings or establishments with odd-numbered addresses can use drip-irrigation systems or hand water trees and large shrubs to minimally maintain their viability on Saturday only, between the hours of 7 p.m. and 10 a.m.
- Water waste patrols will be increased to ensure the above conservation measures are being enforced.
- System water losses will be evaluated, and steps will be taken to reduce these losses.
- Expansion of the public information campaign will be implemented to communicate the significance of the measures to the public.
- Line flushing throughout the city will be reduced.
- Drought water rate structures and/or surcharges will be implemented to encourage conservation methods.

5.1.6 Stage 6: (Greater than 50% Reduction of Normal Water Supply)

Extreme water shortages require drastic reductions in water usage and correlates to Level F of the City's Municipal Code §5-5.13. All actions listed below are in addition to the previous stages unless a stricter restriction applies and is noted.

- All outdoor application of irrigation other than for edible crops specifically for personal consumption shall be eliminated.
- Water waste patrols will be increased to ensure the above conservation measures are being enforced.
- Expansion of the public information campaign will be implemented to communicate the significance of the measures to the public.
- System water losses will be evaluated, and steps will be taken to reduce these losses.
- Line flushing throughout the city will be reduced.
- Increases to drought rate structure and/or surcharges will be implemented.

Table 5-1 shows the demand reduction actions and their associated percentage by which it is anticipated each action will reduce overall system demands. Although the City has not experienced water supply shortages historically, even during drought conditions, the City continues to implement demand reduction efforts year-round and additional mandatory demand reductions in response to periods of dry hydrology or other water shortage conditions that may arise not related to drought conditions. This table is reformatted from the standard DWR Submittal Table 8-2 but presents the same information.

Table 5-1: Demand Reduction Actions (DWR WSCP Submittal Table 8-2)

Shortage Stage	City Ordinance Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
1	A	Landscape – Limit landscape irrigation to specific times	9%	Irrigation & recreation uses shall be restricted to the hours of 12am-10am and 7pm-12am.	Yes
2	B	Landscape - Limit landscape irrigation to specific days and times	17%	Limited to 3 days/week, and irrigation & recreation uses shall be restricted to the hours of 12am-10am and 7pm-12am.	Yes
3	C	Landscape – Limit landscape irrigation to specific days and times	25%	Limited to 2 days per even parcels & 2 days per odd parcels. Irrigation & recreation uses shall be restricted to the hours of 12am-10am and 7pm-12am.	Yes
3	C	Increase wastewater patrols	2%		No
4	D	Landscape – Limit landscape Irrigation to specific days and times	33%	Irrigation and recreation use shall be limited to 1 day per even parcels & 1 day per odd parcels. Irrigation & recreation uses shall be restricted to the hours of 12am-10am & 7pm-12am.	Yes
4	D	Increase Water Waste Patrols	2%		No
4	D	Reduce system water loss	1%		No
4	D	Expand public information campaign	1%		No
4	D	Implement or Modify Drought Rate Structure or Surcharge	2%	Drought rates and/or surcharges will be assessed based on water usage rates.	Yes

Shortage Stage	City Ordinance Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
5	E	Landscape – Limit landscape irrigation to specific days and times	37%	Irrigation & recreation use shall be limited to drip systems designed only to irrigate trees and bushes to minimally maintain their viability. Irrigation & recreation uses shall be restricted to the hours of 12am-10am & 7pm-12am.	Yes
5	E	Increase water waste patrols	2%		No
5	E	Reduce System Water Loss	1%		Yes
5	E	Expand public information campaign	1%		No
5	E	Decrease line flushing	1%		No
5	E	Implement or modify drought rate structure or surcharge	5%	Drought rates and/or surcharges will be assessed based on water usage rates.	Yes
6	F	Landscape – Prohibit all landscape irrigation	39%		Yes
6	F	Increase water waste patrols	2%		No
6	F	Reduce system water loss	1%	Some measures can be implemented quickly, others may take longer due to implementation processes	No
6	F	Expand public information campaign	1%		No
6	F	Decrease line flushing	1%		No
6	F	Implement or modify drought rate structure or surcharge	7%	Drought rates and/or surcharges will be assessed based on water usage rates.	Yes

5.2 Supply Augmentation

Legal Requirements:

§10632(a)(4)(A) *Locally appropriate supply augmentation actions.*

As discussed above, there are a variety of circumstances that can render a source inconsistent.

Mandatory conservation is often the most effective way to reduce demands to meet a supply reduction situation. Implementation of conservation measures only take the amount of time required to properly notice the public of measures being implemented. In the instance self-monitored implementation is not effective enough, the City could increase water waste patrols and implement penalties allowed in the City's Municipal Code and discussed above.

In the instance additional supplies are necessary, lead time to implement projects are lengthier than conservation measures and would only be sought in critical Shortage Stages, such as Stages 5 or 6, as indicated in **Table 5-2**.

Table 5-2: Supply Augmentation and Other Actions (DWR WSCP Submittal Table 8-3)

Shortage Stage	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference
5 or 6	New Recycled Water	Up to 15%	The City could consider treating wastewater effluent and distributing it for use in lieu of potable water
6	Stored Emergency Supply	10%	The City could consider utilizing above ground storage tanks and store non-potable supplies for emergency non-potable demand purposes such as fire suppression.

5.3 Operational Changes

Table 5-1 provides a summary of common categories of restrictions and prohibitions that may be placed on end users by a water agency and includes a description of the restrictions and prohibitions being used by the City.

The categories of restrictions and prohibitions in **Table 5-1** come from State of California guidance in preparation of UWMPs. The demand reduction Stages identified in this WSCP are cumulative so any restriction or prohibition that begins in a lower stage continues and is added to in a higher stage.

The City will also implement the restrictions in its own practices and, if necessary, contemplate further reductions of non-urgent demands such as water main flushing or hydrant exercises.

5.4 Emergency Response Plan

The City's various departments manage emergencies as needed, including the Public Works Department for impacts to water system infrastructure. The City's Fire Department is part of the CalFire agency, which also has emergency response protocols the City can utilize, as appropriate. Finally, the County of Madera has and Emergency Operations Plan and includes coordination with the City on emergency responses for a wide variety of emergencies that also encompass impacts to water system infrastructure components.

5.5 Seismic Risk Assessment and Mitigation Plan

CWC §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 multiphaser 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 City maintains a General Plan (PMC & City of Madera, 2009) originally adopted in 2009, that outlines specific protocol and policy to address health and human safety concerns regarding seismic activity in the Central Valley of California. These Policies are all integrated in Policy HS-7 of the City's General Plan under Chapter 6 Health and Safety Element and is linked in the footnote below.

In addition to the General Plan, the City is also a partner in the Madera County Local Hazard Mitigation Plan [LHMP (Morrison, 2017)] that was adopted in October 2017 (**Appendix B**). The Hazard Mitigation Plan identifies potential hazards, including seismic risk, their likelihood of occurring and the significance of their impact on the City, as a whole. The plan identifies a wide assortment of hazards and assesses the City's vulnerability to each. Specifically, Table B-5 of the LHMP indicates likelihood of seismic activity as "Unlikely" and the magnitude as "Limited". "Unlikely" is defined as "Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years" and "Limited" is defined as "10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability" (Morrison, 2017).

5.6 Shortage Response Action Effectiveness

The anticipated effectiveness of each shortage response action is shown in **Table 5-1**. The anticipated percentage reductions for each measure are derived from a combination of the City's experience and calculated reductions based on mandated water use limits for various customer classes.

The City utilizes a range of Consumption Reduction Methods and Operational Changes to develop the Water Shortage Stages found in this plan. As previously stated, the City will implement penalty restrictions and tighten irrigation allowances as deemed necessary for each respective demand reduction Stage to help make each one the most effective.

6 Communication Protocols

Legal Requirements:

CWC §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 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.

The City Administrator, or their designee, will identify potential water shortages, and propose Shortage Stages to be implemented. Prior to implementing Shortage Stages, the City Administrator will present the proposed Stage to City Council for approval. Typically, Shortage Stages will be utilized sequentially; however, in times of urgency or critical water shortages, stages may be used out of order. The City Council always has discretion to delay or speed declaration of a given response level depending on other conditions.

The public and any interested parties shall be notified of any potential water shortages, declarations of water shortages, and response actions via public notices, the billing process, and/or announcements on the utility's website. Shortage stages shall be effective immediately upon notification to the public and stakeholders.

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7 Compliance and Enforcement

Legal Requirements:

Water Code 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 City Engineer or their designee, will be responsible for evaluating available data on a consistent basis and adequately determining the proper water shortage stage, progress made on conservation efforts, and if the appropriate level of water consumption reduction is being met.

Section 5 outlines the various water conservation measures during each water shortage stage, as well as the various enforcements. The penalties for each stage are also outlined in this section and can vary depending on the activated Water Shortage Stage. Enforcement of various water conservation strategies is carried out by staff members of the water utility including water wasting patrols.

7.1 Penalties, Charges, Other Enforcement or Prohibitions

Water Conservation Program staff are responsible for enforcement of water conservation regulations as outlined in the Madera Municipal Code. Staff responds in some way to each of the reports received related to customers not following water use regulations. Customers may report incidents of water waste or leaks that are observed within the City of Madera. Reports may be submitted online to the City's Water Conservation Supervisor, or by phone at (559) 661-5466. The City also maintains an after-hours water emergency hotline: (559) 675-4200.

7.1.1 Warning and Citation Protocols, Fines and Surcharges

When a violation of the water conservation ordinance is noted, the following enforcement cycle is used:

- First offense: $75 fine
- Second violation: $200 fine
- Third and subsequent violations: $500 fine

Those cited may appeal to the City if they believe the citation is unfair either online[1] or by mailing or sending through facsimile, a form detailing the reason for appealing the citation.

[1] https://www.madera.gov/home/departments/public-works/water/water-citation-appeal/

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8 Legal Authorities

§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.

(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.

This WSCP adheres with the California Water Code 10632. This document is also required by State law as outlined in the Water Code, which states that, "Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan…" (WC 10632). As an established California Water Utility, the City has the authority to implement the WSCP, declare water shortages, and implement shortage response actions including statutory authorities, ordinances, resolutions, and contract provisions.

The City will follow the protocols outlined in this WSCP should it become necessary to declare a water shortage emergency.

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9 Financial Consequences of WSCP

9.1 Potential Revenue Reductions and Expense Increases

Legal Requirement

§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 Action described in paragraph (4)

Agencies typically experience a decrease in revenue with reduced water uses (demands). Additionally, cost expenditures may also increase with elevated outreach activities, increased staffing needs to implement conservation programs, and responses to customer questions and/or complaints.

9.2 Mitigation Actions

Legal Requirement

§10632 (a)(8)(B) *A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage Response Actions described in paragraph (4).*

9.2.1 Use of Financial Reserves

The City has a financial reserve for use in times of emergency. It may be appropriate to utilize this reserve during times of revenue reduction as described above. This strategy would require action by the City Council and parameters for the precise implementation would be specified at the time of use.

9.2.2 Drought Surcharges

If revenues decrease to an unsustainable level, the City may choose to evaluate revisions to the water rates or implementing a surcharge. A surcharge that is implemented in times of water shortage is different than a conservation rate structure, which is always in place.

9.3 Cost of Compliance

Legal Requirement

§10632 (a)(8)(C) *A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.*

Declaring a water shortage and enforcing response actions can be performed by existing staff with no significant increases in operating cost. Other costs of compliance are associated with increased public awareness information (mailing information or updating website information frequently), increased issuance of violations/citations, and increased response to appeals. While these efforts should not necessitate additional staffing, there may be costs associated with increased duties for existing staff.

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10 Monitoring and Reporting

Legal Requirement

§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.*

The City is, and historically has been, in compliance with the state reporting requirements. The City uses meters to monitor all water deliveries to consumers, which assists in assuring customer compliance. Additionally, the City maintains a protocol for receiving and addressing complaints of non-compliance and misuse.

In all Stages, City staff record daily and monthly totals for production and deliveries. Each month, the demands are compared against production capacities and evaluated for sufficiency. In heightened Shortage Stages, more frequent monitoring may be implemented to evaluate conservation measures against requirements.

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11 WSCP Refinement Procedures

Legal Requirement

§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.*

The WSCP may be updated at any time when the urban water supplier believes significant changes have occurred that may affect the contents of the plan. If major changes are made to this 2020 WSCP, the City will hold an additional public hearing and City Council will readopt the plan. Copies of amendments or changes to the plan shall be submitted to DWR, the California State Library, and Madera County within 30 days of adoption.

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12 Special Water Feature Distinction

Legal Requirements:

§10632(a)(10)(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.*

Health and Safety Code Section §115921 *As used in this article the following terms have the following meanings: (a) "Swimming pool" or "pool" means any structure intended for swimming or recreational bathing that contains water over 18 inches deep. "Swimming pool" includes in-ground and aboveground structures and includes, but is not limited to, hot tubs, spas, portable spas, and non-portable wading pools.*

The Water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, are to be defined separately from swimming pools and spas.

The City's Code of Ordinances, Section 5-5.14 does not specifically address water features, but does define allowable outdoor water uses including swimming pools. The City does not further define other water features; however, restrictions are applicable to them as they are to other water uses throughout the City.

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13 Plan Adoption, Submittal, and Availability

Legal Requirements:

CWC §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.

CWC §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.

CWC §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 public hearing was held prior to the adoption of the WSCP and was adopted as prepared. The hearing provided an opportunity for the City's customers, residents, and employees to learn and ask questions about the current and future water supply of the City. The public hearing was held on September 21, 2022.

The WSCP was made available to the City's customers and County of Madera, adopted, and submitted to the State in the same fashion as the UWMP, which is described in Section 10 of the 2020 UWMP. Within 30 days of submitting the UWMP and WSCP to DWR, the adopted plans will be available for public review during normal business hours at the City of Madera Public Works office. The City will also post a copy of the adopted UWMP and WSCP on its website (https://www.madera.gov/). **Appendix C** contains the Adopting Resolution.

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14 References

City of Madera. (2020). *Code of Ordinances.* Cincinnati: American Legal Publishing Corporation.

DWR. (2021, March). *Urban Water Management Plan Guidebook 2020.*

Morrison, F. (2017). *Madera County Local Hazard Mitigation Plan Update.*

PMC, & City of Madera. (2009). *City of Madera General Plan.* Retrieved from https://www.madera.gov/wp-content/uploads/2020/12/City-of-Madera-GP-12-04-20.pdf

Provost & Pritchard Consulting Group. (2022). *2020 Urban Water Management Plan.* Madera.

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Appendices

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Appendix A
City Ordinance 944 C.S.

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ORDINANCE NO. 944 C.S.

AN ORDINANCE AMENDING SECTION 5-5.13 OF CHAPTER 5 OF TITLE V OF THE MADERA MUNICIPAL CODE PERTAINING TO WATERING RESTRICTIONS

WHEREAS, it is necessary for the City to further refine regulations relating to the City's water system and enforcement of water conservation; and

WHEREAS, the City has considered the totality of the Municipal ordinance pertaining to water and has determined that certain provisions are needed for the effective implementation and protection of the City's water system.

THE CITY COUNCIL OF THE CITY OF MADERA, CALIFORNIA, DOES ORDAIN AS FOLLOWS:

Section 1. Recitals. The Recitals set forth above are true and correct and incorporated herein by reference.

Section 2. Section 5-5.13(A) of Chapter 5, of Title V of the Madera Municipal Code is hereby amended to read as follows:

(A) *Drought levels.* When the City Council by resolution determines that water supplies are limited and additional conservation measures are necessary to reduce water consumption, the Council may enact one of ~~five~~[six] drought water restriction levels A through ~~E~~[F] as set forth in this subsection, and restrictions under each section shall be enforced for such period of time as designated by the City Council or until lifted by them by separate resolution. [The City Council at any time may prohibit all organized carwashes not conducted as part of a licensed car wash business, if it determines by resolution it is warranted to contribute to other enacted water restrictions intended to reduce water consumption.]

Level A

When the City Council by resolution determines it is warranted that additional water restrictions are necessary to reduce water consumption by limited means, the following restrictions shall apply:

Outdoor application of water for irrigation and recreation uses shall be restricted to the hours of 12:00 a.m. to 10:00 a.m. and 7:00 p.m. to 12:00 a.m.

[Level B

When the City Council by resolution determines it is warranted that additional water restrictions are necessary to reduce water consumption by moderate means, the following restrictions shall apply:

Outdoor application of water for irrigation and recreation uses shall be restricted to the hours of 12:00 a.m. to 10:00 a.m. and 7:00 p.m. to 12:00 a.m., and restricted to usage

on Sunday, Wednesday, and Friday for parcels with even numbered street addresses, and Tuesday, Thursday and Saturday for parcels with odd numbered street addresses.]

Level ~~B~~[C]

When the City Council by resolution determines it is warranted that additional water restrictions are necessary to reduce water consumption by moderate means, the following restrictions shall apply:

Outdoor application of water for irrigation, recreation uses shall be restricted to the hours of 12:00 a.m. to 10:00 a.m. and 7:00 p.m. to 12:00 a.m., and restricted to usage on Sunday and Wednesday for parcels with even numbered street addresses and Saturday and Tuesday for parcels with odd numbered street addresses.

Level ~~C~~[D]

When the City Council by resolution determines it is warranted that additional water restrictions are necessary to reduce water consumption by significant means, the following restrictions shall apply:

Outdoor application of water for irrigation and recreation uses shall be restricted to the hours of 12:00 a.m. to 10:00 a.m. and 7:00 p.m. to 12:00 a.m., and restricted to usage on Sunday for parcels with even numbered street addresses and Saturday for parcels with odd numbered street addresses.

Level ~~D~~[E]

When the City Council by resolution determines it is warranted that additional water restrictions are necessary to reduce water consumption by aggressive means, the following restrictions shall apply:

Outdoor application of water for irrigation of plants shall be limited drip system designed to only irrigate trees and bushes to minimally maintain their viability. The application of water shall be restricted to the hours of 12:00 a.m. to 10:00 a.m. and 7:00 p.m. to 12:00 a.m., and restricted to usage on Sunday for parcels with even numbered street addresses and Saturday for parcels with odd numbered street addresses.

Level ~~E~~[F]

When the City Council by resolution determines it is warranted that additional water restrictions are necessary to reduce water consumption by extreme means, the following restrictions shall apply:

All outdoor application of water for irrigation of plants other than edible crops for personal consumption shall be eliminated.

~~The City Council at any time may prohibit all organized carwashes not conducted as part of a licensed car wash business, if it determines by resolution it is warranted to contribute to other enacted water restrictions intended to reduce water consumption.~~

Section 3. If any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this Ordinance. The City Council hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be declared unconstitutional or void for any other reason.

Section 4. Effective Date. This ordinance shall be effective and of full force and effect at 12:01 a.m. on the 31st day after its passage.

* * * * * * * * * *

The foregoing Ordinance No. 944 C.S. was introduced and given its first reading at a regular meeting of the City Council of the City of Madera held on the 19th day of July, 2017 and adopted after a second reading at a regular meeting of the City Council held on the 2nd day of August, 2017 by the following vote:

AYES:	Mayor Medellin, Council Members Foley Gallegos, Rodriguez, Holley, Robinson, Oliver, Rigby.
NOES:	None.
ABSTENTIONS:	None.
ABSENT:	None.

APPROVED:

ANDREW J. MEDELLIN, Mayor

ATTEST:

SONIA ALVAREZ, City Clerk

CITY OF MADERA INCORPORATED March 27, 1907 CALIFORNIA

APPROVED AS TO LEGAL FORM:

BRENT RICHARDSON, City Attorney

Appendix B
Madera County Multi-Jurisdictional Local Hazard Mitigation Plan Update (Excerpt)
Annex B: City of Madera

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Annex B City of Madera

B.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Madera, a new participating jurisdiction to the Madera County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to the City of Madera, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

B.2 Planning Process

As described above, the City of Madera followed the planning process detailed in Section 3 of the base plan. In addition to providing representation on the Madera County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table B-1. Additional details on plan participation and City representatives are included in Appendix A.

Table B-1 City of Madera Planning Team

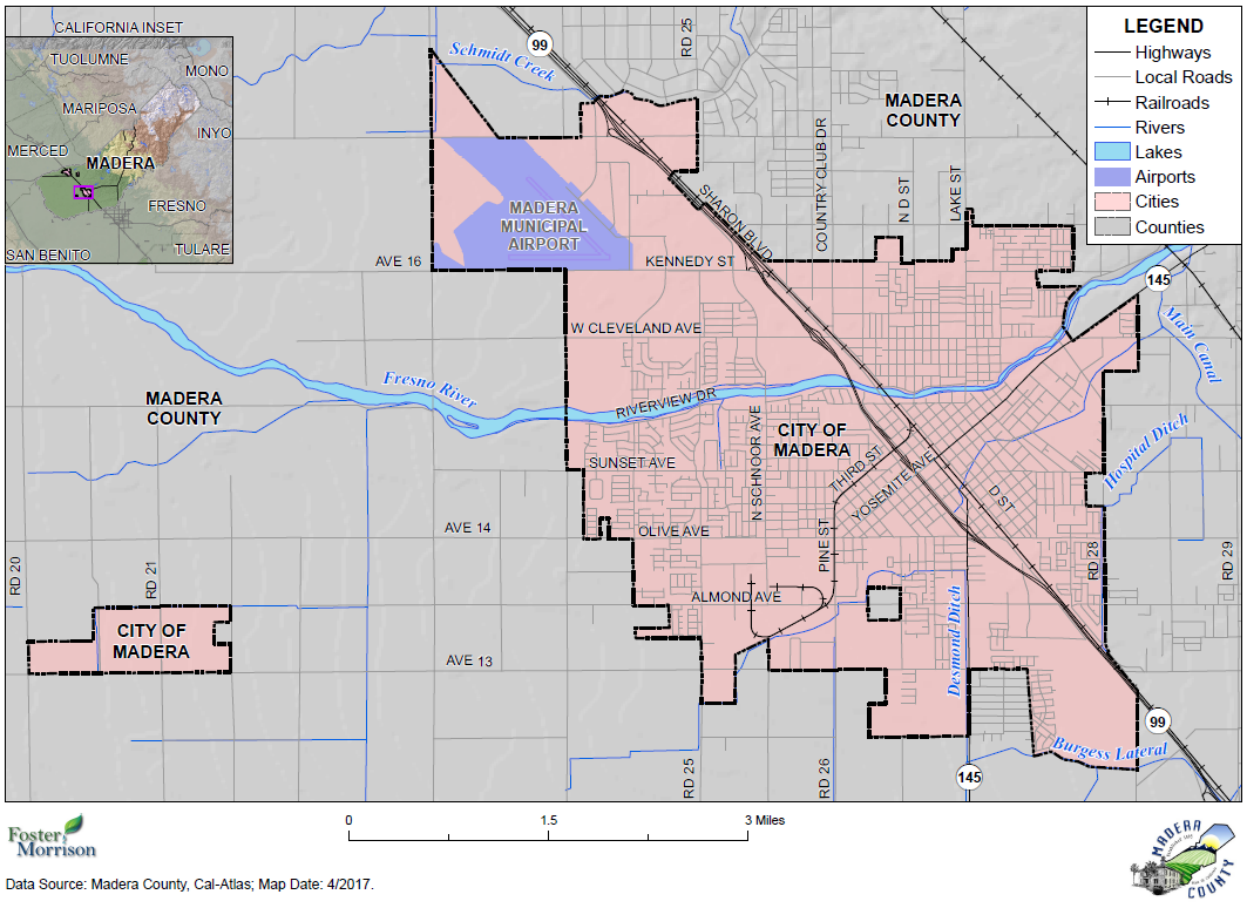
Name	Position/Title	How Participated
Keith Helmuth	City Engineer	Attended planning meetings. Provided input and document review. Supplied updated information.
Eugene Haynes	Administrative Analyst	Attended planning meetings. Provided input and document review. Supplied updated information.
Wendy Silva	Director of Human Resources	Attended planning meetings. Provided input and document review. Supplied updated information.
Dave Randall	Public Works Operations Director	Attended planning meetings. Provided input and document review. Supplied updated information.
Chris Boyle	Planning Manager	Attended planning meetings. Provided input and document review. Supplied updated information.
Steve Frazier	Police Chief	Attended planning meetings. Provided input and document review. Supplied updated information.
Dino Lawson	Police Commander	Attended planning meetings. Provided input and document review. Supplied updated information.
Paula Nunez	HR Technician II	Attended planning meetings. Provided input and document review. Supplied updated information.
Robin Bravo	Administrative Analyst	Attended planning meetings. Provided input and document review. Supplied updated information.

Name	Position/Title	How Participated
Mary Church	Administrative Analyst	Attended planning meetings. Provided input and document review. Supplied updated information.
Brent Richardson	City Attorney	Document review prior to Council consideration
David Tooley	City Administrator	Document review prior to Council consideration
David Merchen	Director of Community Development	Document review prior to Council consideration

B.3 Community Profile

The community profile for the City of Madera is detailed in the following sections. Figure B-1 displays a map and the location of the City of Madera within Madera County.

Figure B-1 City of Madera Base Map



B.3.1. Geography and Climate

The City of Madera is the county seat. The City has industrial parks, recreational parks, food and meat processing plants, wineries, and agricultural excellence in diversified farming – all of which contribute to a solid and substantial economy.

The City of Madera is located about midway and toward the eastern edge of the San Joaquin Valley. The Fresno River flows east to west through the City. The terrain around Madera itself is generally level with an abrupt upward slope about 10 miles eastward to the foothills of the Sierra Nevada. The main Sierra Nevada Range is located about 50 miles to the east and extends from 12,000 to more than 14,000 feet in elevation. About 30 miles west of the city lie the foothills of the Coastal Range.

The climate around the City of Madera is dry, mild in winter and hot in summer; nearly nine-tenths of the year's precipitation falls in the six months from November to April. Humidity is commonly as low as 15 percent and has been recorded as low as 8 percent. In contrast, humidity readings may reach 90 percent during the morning hours of December and January. The normal daily maximum temperature advances to a high of 99 degrees during the latter part of July. The daily maximum temperature during the warmest month has ranged from 76 degrees to 115 degrees. Winter temperatures are usually mild but during infrequent cold spells minimum readings occasionally drop below freezing. Heavy frost occurs almost ever year, and the first heavy frost in the autumn usually occurs during the last week of November. The last frost in the spring is in early March.

The City of Madera is situated on a young alluvial fan with permeable to moderately permeable soil.

B.3.2. History

The City of Madera had its beginnings with William Thurman, a lumberman, in 1875 when the area was still part of Fresno County. A V-shaped water flume, 54 miles in length, carried lumber from the high country to Madera by gravity flow. The railhead and later SH-99 marked Madera for its place of importance in the San Joaquin Valley. Madera was chartered as an incorporated city, March 27, 1907.

B.3.3. Economy

The City of Madera, which lies in the county of Madera, has seen substantial growth since 1990. The unemployment rate is approximately 8.2% as of April of 2017. Agriculturally oriented Madera County tends to have higher unemployment rates and greater seasonal variations in unemployment. US Census estimates show economic characteristics for the City of Madera. These are shown in Table B-2.

Table B-2 City of Madera Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	6,958	28.8%
Construction	1,022	4.2%
Manufacturing	2,310	9.6%

Industry	Estimated Employment	Percent
Wholesale trade	426	1.8%
Retail trade	2,685	11.1%
Transportation and warehousing, and utilities	987	4.1%
Information	221	0.9%
Finance and insurance, and real estate and rental and leasing	424	1.8%
Professional, scientific, and management, and administrative and waste management services	1,191	4.9%
Educational services, and health care and social assistance	4,272	17.7%
Arts, entertainment, and recreation, and accommodation and food services	1,618	6.7%
Other services, except public administration	804	3.3%
Public administration	1,211	5.0%

Source: US Census Bureau American Community Survey 2009-2013 Estimates

The City of Madera is home to many industries and companies. Some of the largest employers in the City are shown on Table B-3.

Table B-3 City of Madera – Major Employers

Employer Name	Location	Industry
Ardagh Group	Madera	Glass Containers
B A C	Madera	Assembly & Fabricating Service
Baltimore Aircoil Co	Madera	Refrigerating Equip-Commercial
Georgia-Pacific Madera	Madera	Paper-Manufacturers
Home Depot	Madera	Home Centers
JBT Food Tech	Madera	Food Processing Equipment & Supplies
Lamanuzzi & Pantaleo Cold Stge	Madera	Fruits & Vegetables-Growers & Shippers
Lion Brothers Farm-Newstone	Madera	Farming Service
Lowe's Home Improvement	Madera	Home Centers
Madera City Hall	Madera	Government Offices-City, Village & Township
Madera Community Hospital	Madera	Hospitals
Madera High School	Madera	Schools
Madera Packing Shed	Madera	Sheds-Tool & Utility
Madera South High School	Madera	Schools
Millview School	Madera	Schools
Mission Bell Winery	Madera	Wineries
Primerica Financial Svc	Madera	Financial Advisory Services
San Joaquin Wine Co Inc	Madera	Wineries
Span Construction Inc	Madera	Contractors-Equip/Supplies-Dealers/Services

Employer Name	Location	Industry
Valley Children's Hospital	Madera	Hospitals

B.3.4. Population

The California Department of Finance estimated the January 1, 2017 total population for the City of Madera was 66,082.

B.4 Hazard Identification

Madera's planning team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Madera (see Table B-4).

Table B-4 City of Madera—Hazard Identification Table

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	Limited	Occasional	Limited	High	Medium
Climate Change	Extensive	Highly Likely	Catastrophic	High	High
Dam Failure	Significant	Unlikely	Catastrophic	High	Low
Drought and Water Shortage	Extensive	Likely	Negligible	Moderate	High
Earthquake	Extensive	Unlikely	Limited	High	Low
Flood: 100/200/500–year	Significant	Unlikely	Critical	High	High
Flood: Localized/Stormwater	Limited	Likely	Negligible	Low	High
Hazardous Materials Transportation	Limited	Unlikely	Negligible	Low	Low
Landslides, Rockfalls, and Debris Flows	Limited	Unlikely	Negligible	Low	Low
Levee Failure	Limited	Unlikely	Negligible	Low	Low
Severe Weather: Extreme Cold and Freeze	Extensive	Likely	Limited	Medium	High
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium	High
Severe Weather: Fog	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms (winds, hail, and lightning)	Extensive	Likely	Limited	Medium	High
Severe Weather: Wind and Tornado	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Winter Storms/Snow	Extensive	Likely	Limited	Medium	Medium
Volcano	Limited	Unlikely	Negligible	Low	Low
Wildfire (smoke, tree mortality)	Limited	Occasional	Negligible	Low	Low

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Probability of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

Climate Change Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

B.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Madera's hazards and assess the City's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 4.3 Vulnerability Assessment in the main plan. The hazard profile discusses the threat to the planning area and describes previous occurrences of hazard events and the likelihood of future occurrences. The vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the main plan.

B.5.1. Hazard Profiles

At the beginning of each hazard vulnerability assessment in Section B.5.3, a brief statement is given as to how the hazard affects the City, as well as past occurrences. The intent of these section is to provide jurisdictional specific information on hazards.

B.5.2. Vulnerability Assessment

This section identifies Madera's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Assets at Risk

The following data from the Madera County Assessor's Office is based on the April 2017 Assessor's data. The methodology used to derive property values is the same as in Section 4.3.1 of the base plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table B-5 shows the 2017 Assessor's values (e.g., the values at risk) broken down by property type for the City of Madera.

Table B-5 City of Madera – Total Assets at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Total Value
Agricultural	54	21	$15,599,646	$1,375,375	$16,975,021
Commercial	1,011	756	$149,776,558	$380,288,618	$530,065,176
Government	140	7	$7,902,235	$1,206,773	$9,109,008
Industrial	238	108	$29,036,522	$105,604,507	$134,641,029
Institutional	84	63	$3,348,429	$23,439,765	$26,788,194

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Total Value
Residential	14,218	13,165	$533,242,661	$1,471,380,915	$2,004,623,576
Utilities	233	4	$447,563	$305,052	$752,615
Unknown	73	8	$5,921,938	$5,795,090	$11,717,028
Total	**16,051**	**14,132**	**$745,275,552**	**$1,989,396,095**	**$2,734,671,647**

Source: Madera County April 2017 Parcel/Assessor's Data

Critical Facilities and Infrastructure

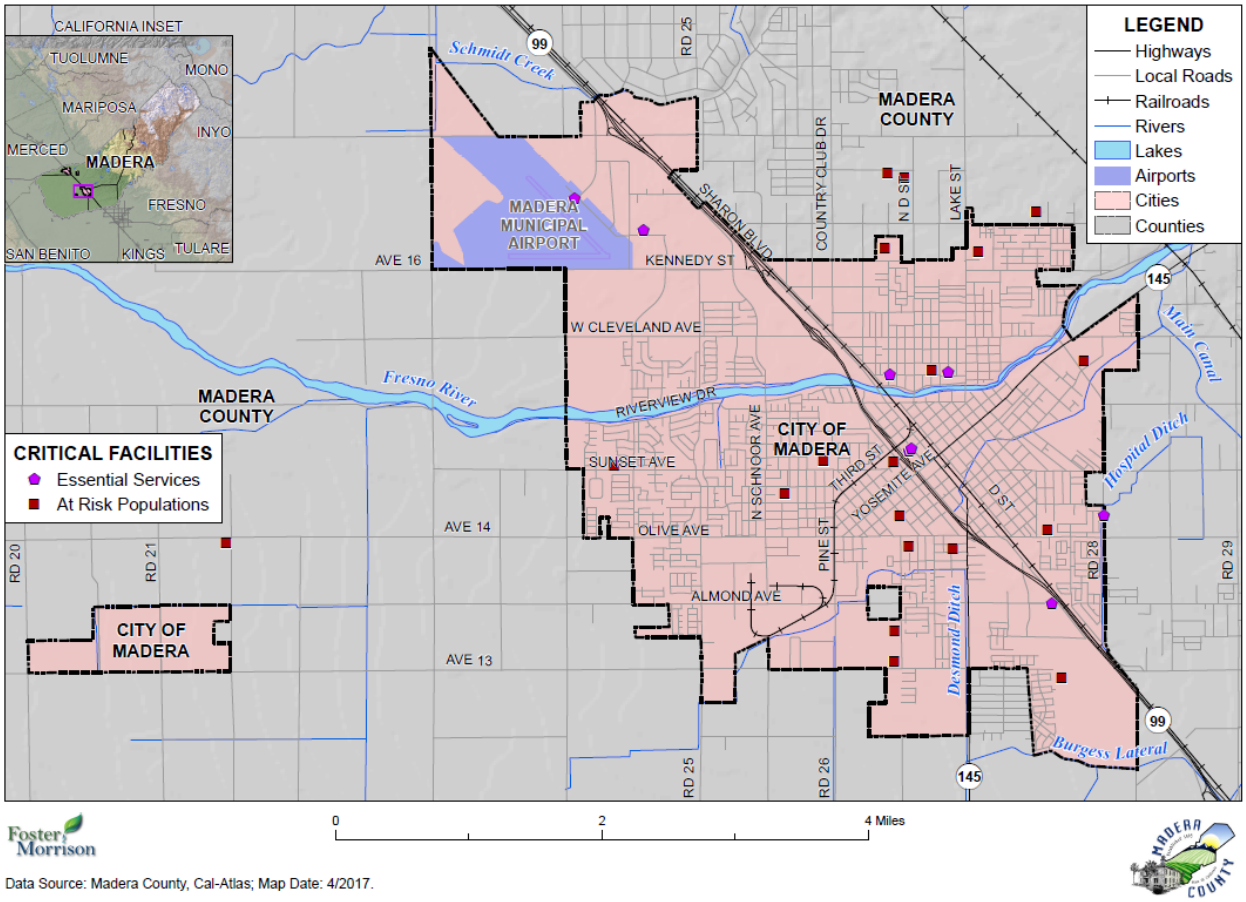
For purposes of this plan, a critical facility is defined as:

> *Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.*

This definition was refined by separating out three classes of critical facilities as further described in Section 4.3.1 of the base plan.

An inventory of critical facilities in the City of Madera from Madera County GIS is shown on Figure B-2 and detailed in Table B-6. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure B-2 City of Madera – Critical Facilities



Data Source: Madera County, Cal-Atlas; Map Date: 4/2017.

Table B-6 City of Madera – Critical Facilities Inventory

Critical Facility Type	Critical Facility Count
Essential Services	
Airport and Radio Tower	1
City Hall Admin Critical Infrastructure	1
Community Services / Engineering and Infrastructure Services / IT Communications	1
Critical Communications	1
Emergency Dispatch Center	1
Fire Command Center	1
Medical Center	1
Police Dispatch Communication Center	1
Essential Services Total	**8**
At Risk Populations	
School	15
At Risk Populations Total	**15**

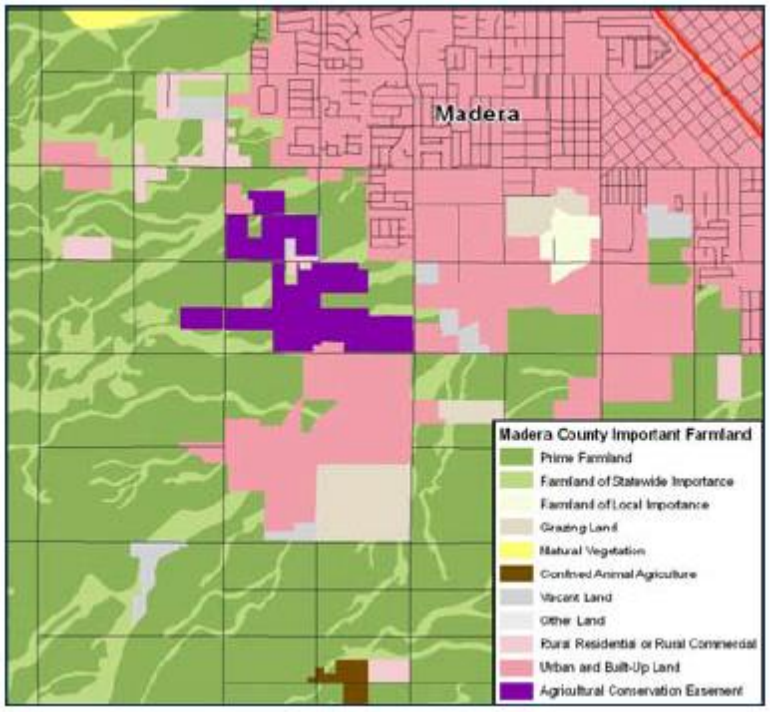
City of Madera Grand Total	**23**

Source: Madera County GIS

Natural Resources

The City of Madera has a variety of natural resources of value to the community. As one of the primary sources of regional income, agriculture activity and the prime soils that support it are critical to the future of Madera. In the current city limits, about 950 acres—about one-tenth of the city—are in agricultural use (mostly near the Madera Airport, where land use restrictions preclude most urban uses). As is the case throughout the Central Valley, some farmland in Madera County is being lost to urbanization to meet the needs of the region's growing population. In 2002, Madera County farmers joined with County agricultural officials and state and federal conservation agencies to create an area of protected agriculture land in the southwest area of Madera. The 440-acre area (shown on Figure B-3) was established to help direct growth away from the west edge of Madera in recognition of the agricultural value the land in this area represents. While the protected area creates an irregular and noncontiguous barrier, its presence clearly reflects the intent to keep these and other lands further to the west in agricultural production.

Figure B-3 City of Madera – Farmlands near City



Source: City of Madera 2009 General Plan Conservation Element

The California Natural Diversity Database (a computerized database that shows where sensitive plants and animals have been found) documents seven plant and animal special-status species that have been found in the past in the Planning Area. The Database also shows one "natural community" that has also been found in the Planning Area. (Note: The list below is of species whose presence has been recorded within a one-mile radius of the Planning Area in the CNDDB. Other sensitive plants and animals have been found in or

have the potential to be found in the Planning Area, but are not recorded in the CNDDB.) Sensitive plants and animals that have been found in the Planning Area and are in the CNDDB are listed below.

- Burrowing Owl;
- California Tiger Salamander;
- Blunt nosed leopard lizard;
- California linderiella ("fairy shrimp");
- Vernal pool fairy shrimp;
- Madera leptosiphon;
- Hairy orcutt grass.

Although most of the Planning Area has been changed from its natural condition by farming and urban uses, a few areas of natural habitat remain. These include:

- Annual grasslands;
- Riparian areas;
- Wetlands.

In addition, according to state records, one type of "Natural Community" is found in the Planning Area. This Natural Community, Northern Hardpan Vernal Pool, contains vernal pools (which fill seasonally during the rainy season) that could harbor sensitive plant and animal species (including fairy shrimps). These vernal pools are generally found in annual grasslands, grasslands where the soils include an impermeable clay-pan layer below the surface, conditions which are widely distributed in the eastern portion of the Planning Area.

Historic and Cultural Resources

The California Office of Historic Preservation database shows that the City of Madera has registered federal historic sites. These are shown on Table B-7.

Table B-7 City of Madera – Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	California Register	Point of Interest	Date Listed	City
Madera County Courthouse (N108)	X				9/3/1971	Madera

Source: California Department of Parks and Recreation Office of Historic Preservation, http://ohp.parks.ca.gov/

Growth and Development Trends

The City of Madera has seen consistent growth since the 1910s, with a small slowing between 1960 and 1970. From 1990 to 2010 growth was very strong. Between 2010 and 2017, the City has experienced a smaller population growth. This can be seen in Table B-8.

Table B-8 City of Madera – Population Growth 1910 to 2017

Year	Population	Percent increase or decrease
1910	2,404	–

Year	Population	Percent increase or decrease
1920	3,444	43.3%
1930	4,665	35.5%
1940	6,457	38.4%
1950	10,497	62.5%
1960	14,430	37.5%
1970	16,044	11.2%
1980	21,732	35.5%
1990	29,281	35.32
2000	43,207	47.6%
2010	61,416	42.1%
2017	66,082	7.6%

Source: US Census Bureau, California Department of Finance

Special Populations

Madera, California is located in the exact center of the state, with Madera County encompassing 2,147 square miles, with the City of Madera covering approximately 14 square miles. The most recent California Department of Finance population estimate provided in 2017 was 156,492 for Madera County, of those 66,082 (or 42%) reside in the City of Madera.

The population of the City of Madera is as diverse as the plethora of agricultural products grown in the region. From the 2010 census, the racial makeup of Madera was 49.9% White, 3.4% African American, 3.1% Native American, 2.2% Asian, 0.1% Pacific Islander, 36.8% from other races, and 4.4% from two or more races. Hispanic or Latino of any race accounted for 76.7% of the population. Approximately 33% of the population is foreign born. The median age for Madera is 27.6, and seniors 65 years-old and older make up 7.6% of the city's population. The average median household income is $40,457, with senior household median income at $33,293. Just under 28% of individuals live below the federal poverty level. However, for foreign born residents, almost 31% live below the poverty level. Poverty rates are also higher among the disabled with 32% for disabled females and 31% for disabled males. Madera's senior population is especially vulnerable with 23% of seniors living alone, and 6% of Madera senior households having an annual income of less than $10,000 and 33% with incomes of less than $20,000 annually. Approximately 9% of the population under the age of 65 has a disability, and 13% percent of the population do not have health insurance.

Development since 2011 Plan

The City searched through building permits issued from July 2011 through July 2017. The following was found:

- New Single Family – 711
- New Multi Family – 1
- New Commercial Buildings – 10

The City does not track building permits by hazard risk areas. However, effective building codes and construction standards within the City will assist mitigating potential losses from any new development. With continued population growth, the City's vulnerability to flood, and possibly wildfire, will likely continue to increase as well.

Future Development

Estimates of future populations in the City was performed for the 2016-2024 City of Madera Housing Element. By 2035, Madera is projected to have a population of 137,975 in the general population. Growth projections from the 2014-2023 Housing Element can be found in Table B-9.

Table B-9 City of Madera – Future Population Projections

Location	2020	2035
Madera	98,914	137,975

Source: City of Madera 2014-2023 Housing Element

More general information on growth and development in Madera County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Madera County Vulnerability and Assets at Risk of the main plan.

B.5.3. Estimating Potential Losses

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table B-4 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the base plan for more detailed information about these hazards and their impacts on the Madera County planning area). Methodologies for calculating loss estimates are the same as those described in Section 4.3 of the base plan. In general, the most vulnerable structures are those located within the floodprone areas, WUI areas, unreinforced masonry buildings, and buildings built prior to the introduction of modern building codes.

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.

- **Extremely High**—Very widespread with catastrophic impact.

Ag Hazards: Severe Weather/Insect Pests

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Given the importance of agriculture to Madera County and the City of Madera, agricultural hazards continue to be an ongoing concern. The primary causes of agricultural losses are severe weather events, such as drought, freeze, and insect infestations. According to the City Planning Team, agricultural losses occur on an annual basis throughout the County and are usually associated with these severe weather events.

Past Occurrences

The City Planning Team noted that historically, the State of California and the Central Valley in particular have experienced a multi-year drought. This is an ongoing hazard. Freezes generally occur at least once per year.

Vulnerability to Ag Hazards

As one of the primary sources of regional income, agriculture activity and the prime soils that support it are critical to the future of Madera. In the current city limits, about 950 acres—about one-tenth of the city—are in agricultural use (mostly near the Madera Airport, where land use restrictions preclude most urban uses). The vulnerability of the City is mainly economic.

Future Development

In 2002, Madera County farmers joined with County agricultural officials and state and federal conservation agencies to create an area of protected agriculture land in the southwest area of Madera. The 440-acre area (shown on Figure B-3 above) was established to help direct growth away from the west edge of Madera in recognition of the agricultural value the land in this area represents. While the protected area creates an irregular and noncontiguous barrier, its presence clearly reflects the intent to keep these and other lands further to the west in agricultural production. This protected area will not be developed.

Climate Change

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Climate change will require the City of Madera to prepare for warmer and more extreme temperatures, decreased water supply, drought, flooding, increasing energy and water demand, and public health risks. In California average temperatures are projected to rise as much as 9 degrees Fahrenheit by 2100. This is especially pertinent for Madera where extreme heat events are likely to increase and urban heat islands may

intensify already high temperatures. Characterized by asphalt roads, concrete roofs, and energy use, urban developments modify the natural landscape using materials that create and/or retain heat.

Past Occurrences

The City Planning Team noted that climate change is an ongoing vulnerability. Specific past occurrences were not known.

Vulnerability to Climate Change

The City's population, resources, and economy are vulnerable to climate change impacts, particularly flooding, extreme heat, extreme cold and water supply.

Future Development

The State of California is taking the lead on state-wide policies to address development and climate change. The City of Madera will follow that lead. Environmental impacts will be considered as development occurs. Specific to the potential for increased flooding, the City may need to consider redesigning/reconstructing storm drainage facilities based on previous assumptions of rainfall that may in the future result in existing facilities being undersized.

Dam Failure

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Dam failures can result from a number of natural or man-made causes such as earthquakes, erosion of the face or foundation, improper siding, rapidly rising flood waters, structural/design flaws, and deliberate human actions. Madera's location downstream of Hidden Dam also raises the potential for flooding in the highly unlikely event of a failure of the dam.

Past Occurrences

The City Planning Team noted no past occurrences of dam failure to affect the City.

Vulnerability to Dam Failure

TO BE INSERTED WHEN DAM INUNDATION LAYER ARRIVES FROM CAL OES

Future Development

The City does not anticipate it would adjust development based on potential for damn failure. At present, the most likely approach would be to monitor/analyze the existing damn for deficiencies and correct them as they are identified rather than moving development outside the inundation zone or attempt to elevate an entire City.

Drought and Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends. Water districts normally require at least a 10-year planning horizon to implement a multiagency improvement project to mitigate the effects of a drought and water supply shortage.

Past Occurrences

The City Planning Team noted that the City has experienced multiple, consecutive years of drought. In addition, current and all past occurrences have resulted in accelerated decline of the water table.

Vulnerability to Drought

The vulnerability of Madera to drought is citywide, but impacts may vary and include reduction in water supply, agricultural losses, and an increase in dry fuels. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult. The City of Madera is a rural community that is surrounded largely by farmland that is rich in agriculture for a variety of crops including dairy, poultry, horse and cattle ranches that may utilize surface water deliveries from approximately June – September and/or from ground water pumping systems. Since Madera relies on ground water wells, drought and water shortage can cause acute problems.

Future Development

As the population in the area continues to grow, so will the demand for water. Water shortages in the future may be worsened by drought, as the City relies on groundwater for its water source. Increased planning including conjunctive use will be needed to account for population growth and increased water demands.

Earthquake

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as

recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter Magnitude Scale is used to quantify the magnitude or strength of the seismic energy released by an earthquake. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Past Occurrences

No earthquakes of magnitude 5.5 or greater have ever been recorded in the Madera area, nor have there been reports of damage in the area from earthquakes of such magnitude outside the city in Madera County. The most recent notable earthquake affecting Madera occurred on May 30, 2003, with a magnitude of 3.1 and an epicenter located approximately 6 miles west-northwest of Madera.

Vulnerability to Earthquake

The City Planning Team noted that no active earthquake faults are located in the Planning Area—the closest active faults are 50 or more miles distant. The lack of faults in the Planning Area means that the potential for buildings to be damaged if they are placed atop a fault does not exist. Madera is also not subject to liquefaction, a common earthquake-related hazard

Future Development

Future development in the City will be built to 2013 California Building Code. The 2013 CBC factors in the risks of earthquake into the building code.

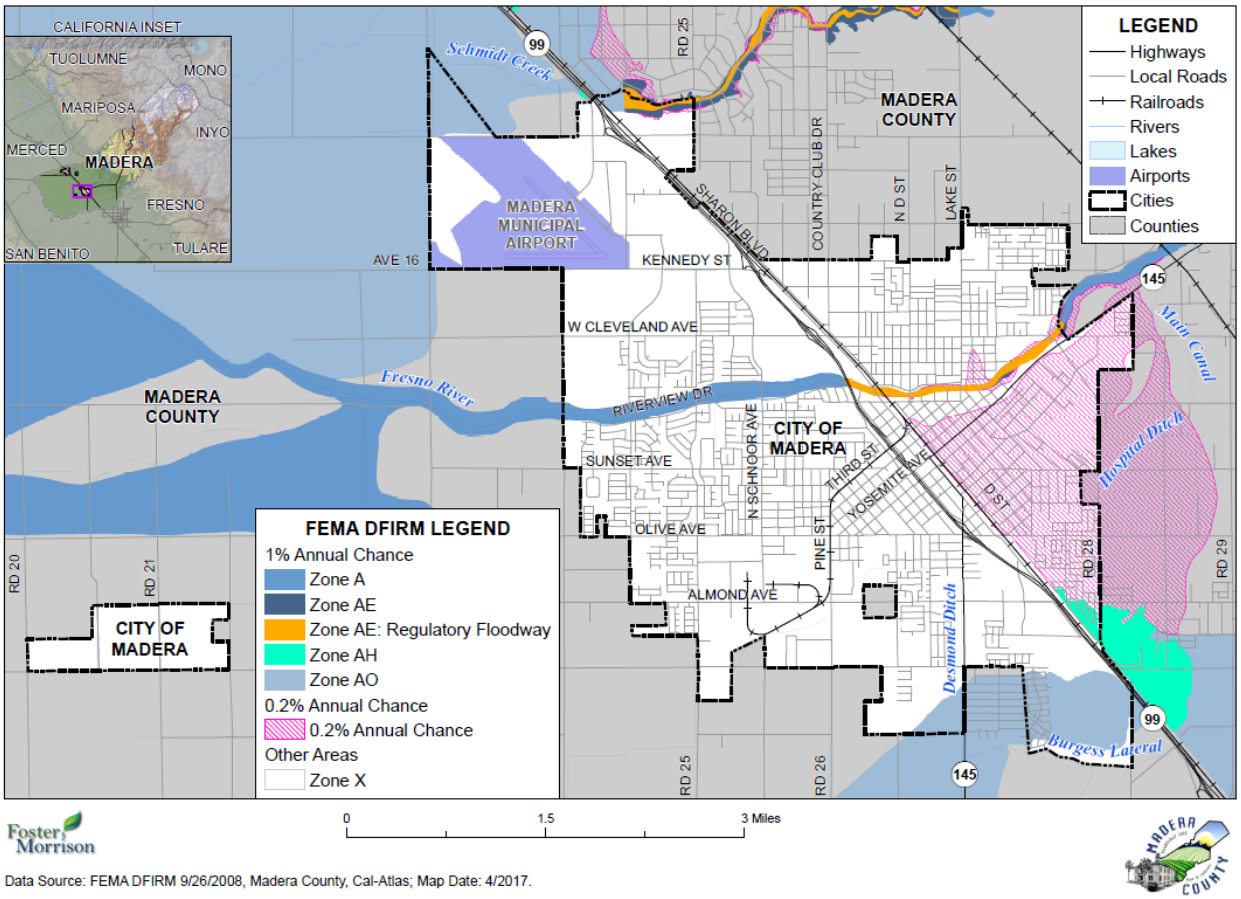
Flood: 100-/500-Year

Likelihood of Future Occurrence–Occasional/Unlikely
Vulnerability–Medium

Hazard Profile and Problem Description

Madera is traversed by several stream systems and is at risk to both the 100-year and 500-year flood. FEMA has identified DFIRM flood zones for the City. This is seen in Figure B-4.

Figure B-4 City of Madera – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 9/26/2008, Madera County, Cal-Atlas; Map Date: 4/2017.

Past Occurrences

In the past, flooding in Madera was a relatively frequent event. Floods struck Madera in 1938, 1943, 1945, 1950, 1952, 1955, 1956, 1958, 1962, 1963, and 1969. The era of flooding in Madera ended with the construction of the Hidden Dam on the Fresno River upstream of the city. Since the construction of the dam in 1976, no floods have occurred in the City.

Vulnerability to Flooding

Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Madera. The methodology described in Section 4.3.7 of the base plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table B-10 shows the property use, improved parcel count, improved values, estimated contents, total values and estimated loss of parcels that fall in a floodplain in the City.

Table B-10 City of Madera – Count and Improved Value by Property Use and Detailed Flood Zone

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	5	0	$2,761	$0	$0	$2,761
Commercial	0	0	$0	$0	$0	$0
Government	3	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Residential	53	44	$2,218,923	$6,490,788	$3,245,394	$11,955,105
Utilities	2	0	$0	$0	$0	$0
Unknown	1	0	$0	$0	$0	$0
Zone A Total	**64**	**44**	**$2,221,684**	**$6,490,788**	**$3,245,394**	**$11,957,866**
Zone AE						
Agricultural	0	0	$0	$0	$0	$0
Commercial	1	0	$6,116,586	$0	$0	$6,116,586
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Residential	3	3	$76,768	$130,060	$65,030	$271,858
Utilities	0	0	$0	$0	$0	$0
Unknown	0	0	$0	$0	$0	$0
Zone AE Total	**4**	**3**	**$6,193,354**	**$130,060**	**$65,030**	**$6,388,444**
Zone AE Floodway						
Agricultural	0	0	$0	$0	$0	$0
Commercial	1	0	$65,266	$0	$0	$65,266
Government	2	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Residential	5	2	$60,456	$163,347	$81,674	$305,477
Utilities	0	0	$0	$0	$0	$0
Unknown	2	0	$471	$0	$0	$471
Zone AE Floodway Total	**10**	**2**	**$126,193**	**$163,347**	**$81,674**	**$371,214**

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Zone AH						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Residential	95	91	$4,848,009	$12,451,631	$6,225,816	$23,525,456
Utilities	1	0	$1	$0	$0	$1
Unknown	0	0	$0	$0	$0	$0
Zone AH Total	**96**	**91**	**$4,848,010**	**$12,451,631**	**$6,225,816**	**$23,525,457**
Zone AO						
Agricultural	8	8	$5,225,236	$369,166	$369,166	$5,963,568
Commercial	0	0	$0	$0	$0	$0
Government	1	1	$170,119	$9,543	$9,543	$189,205
Industrial	0	0	$0	$0	$0	$0
Institutional	1	1	$144,470	$14,147	$14,147	$172,764
Residential	300	288	$13,138,577	$33,570,214	$16,785,107	$63,493,898
Utilities	7	0	$51	$0	$0	$51
Unknown	0	0	$0	$0	$0	$0
Zone AO Total	**317**	**298**	**$18,678,453**	**$33,963,070**	**$17,177,963**	**$69,819,486**
1% Annual Chance Flood Hazard Total	**491**	**438**	**$32,067,694**	**$53,198,896**	**$26,795,876**	**$112,062,466**
0.2% Annual Chance Flood Hazard (Zone X – Shaded)						
Agricultural	5	3	$513,202	$258,038	$258,038	$1,029,278
Commercial	262	202	$18,446,283	$55,003,356	$55,003,356	$128,452,995
Government	32	2	$498,555	$76,478	$76,478	$651,511
Industrial	24	6	$552,949	$217,303	$325,955	$1,096,207
Institutional	23	19	$633,943	$3,411,390	$3,411,390	$7,456,723
Residential	2,416	1,922	$66,247,954	$177,737,705	$88,868,853	$332,854,512
Utilities	43	1	$57,406	$162,846	$162,846	$383,098
Unknown	20	2	$123,395	$999,479	$999,479	$2,122,353
0.2% Annual Chance Flood Hazard Total	**2,825**	**2,157**	**$87,073,687**	**$237,866,595**	**$149,106,394**	**$474,046,676**

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Zone X – unshaded (Outside of Mapped Flood Hazard)						
Agricultural	36	10	$9,858,447	$748,171	$748,171	$11,354,789
Commercial	747	554	$125,148,423	$325,285,262	$325,285,262	$775,718,947
Government	102	4	$7,233,561	$1,120,752	$1,120,752	$9,475,065
Industrial	214	102	$28,483,573	$105,387,204	$158,080,806	$291,951,583
Institutional	60	43	$2,570,016	$20,014,228	$20,014,228	$42,598,472
Residential	11,346	10,815	$446,651,974	$1,240,837,170	$620,418,585	$2,307,907,729
Utilities	180	3	$390,105	$142,206	$142,206	$674,517
Unknown	50	6	$5,798,072	$4,795,611	$4,795,611	$15,389,294
Zone X (unshaded) Total	**12,735**	**11,537**	**$626,134,171**	**$1,698,330,604**	**$1,130,605,621**	**$3,455,070,396**

Source: FEMA 9/26/2008 DFIRM, Madera County April 2017 Parcel/Assessor's Data

Table B-11 summarizes Table B-10 above and shows City of Madera loss estimates and shows improved values at risk by FEMA 1% and 0.2% annual chance flood zones. As shown in this table, there is no 500-year flood risk in the City.

Table B-11 City of Madera – Flood Loss Summary

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood	317	298	$18,678,453	$33,963,070	$17,177,963	$51,141,033	$10,228,207	0.37%
0.2% Annual Chance Flood	2,825	2,157	$87,073,687	$237,866,595	$149,106,394	$386,972,989	$77,394,598	2.83%
Grand Total	**3,142**	**2,455**	**$105,752,140**	**$271,829,665**	**$166,284,357**	**$438,114,022**	**$87,622,804**	**3.20%**

Source: FEMA 9/26/2008 DFIRM, Madera County April 2017 Parcel/Assessor's Data

According to Table B-10 and Table B-11, the City of Madera has 298 improved parcels and approximately $51 million of structure and contents value in the 1% annual chance floodplain; an 2,157 improved parcels and approximately $387 million of structure and contents values in the 0.2% annual chance floodplain. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.7 of the base plan, there is a 1% chance in any given year of a flood event causing roughly $10,228,207 and a 0.2% annual chance in any given year of a flood event causing $77,394,598 million in

damage in the City of Madera. A loss ratio of 3.2% indicates that losses in Madera to flood would be somewhat minor.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City in comparison to total area within the City limits. The same methodology, as discussed in Section 4.3.8 of the base plan, was used for the City of Madera as well as for the County as a whole. Table B-12 and Table B-13 represents a detailed and summary analysis, respectively, of total acres for each FEMA DFIRM flood zone in the City.

Table B-12 City of Madera – Flooded Acres by Land Use Type

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
1% Annual Chance Flood Hazard		
Zone AE Floodway		
Agricultural	0	0
Commercial	0	0
Government	7	0
Industrial	0	0
Institutional	0	0
Residential	6	0
Utilities	0	0
Unknown	12	0
Zone AE Floodway Total	**26**	**0**
Zone AE		
Agricultural	0	0
Commercial	98	0
Government	0	0
Industrial	0	0
Institutional	0	0
Residential	0	0
Utilities	0	0
Unknown	0	0
Zone AE Total	**98**	**0**
Zone A		
Agricultural	45	0
Commercial	0	0
Government	32	0
Industrial	0	0
Institutional	0	0

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
Residential	37	13
Utilities	2	0
Unknown	0	0
Zone A Total	**117**	**13**
Zone AH		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Residential	20	11
Utilities	0	0
Unknown	0	0
Zone AH Total	**20**	**11**
Zone AO		
Agricultural	387	387
Commercial	0	0
Government	7	7
Industrial	0	0
Institutional	14	14
Residential	43	41
Utilities	18	0
Unknown	0	0
Zone AO Total	**469**	**449**
1% Annual Chance Flood Hazard Total	**729**	**473**
0.2% Annual Chance Flood Hazard (Zone X – Shaded)		
Agricultural	39	15
Commercial	106	67
Government	58	0
Industrial	9	4
Institutional	8	6
Residential	578	363
Utilities	63	0
Unknown	15	5
Zone X (shaded) Total	876	461
0.2% Annual Chance Flood Hazard Total	**876**	**461**

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
Zone X – unshaded (Outside of Mapped Flood Area)		
Agricultural	332	116
Commercial	1,062	622
Government	1,549	61
Industrial	698	350
Institutional	156	87
Residential	2,755	2,311
Utilities	337	2
Unknown	101	15
Zone X (unshaded) Total	**6,990**	**3,565**

Source: FEMA 9/26/2008 DFIRM, Madera County April 2017 Parcel/Assessor's Data

Table B-13 City of Madera – Flooded Acres Summary

Flood Zone	Total Flooded Acres	Improved Flooded Acres	% of Improved Flooded Acres
1% Annual Chance Flood Hazard	729	473	10.5%
0.2% Annual Chance Flood Hazard	876	461	10.2%
Outside of Flood Zone	6,990	3,565	79.2%
Grand Total	**8,595**	**4,499**	**100.0%**

Source: FEMA 9/26/2008 DFIRM, Madera County April 2017 Parcel/Assessor's Data

Population at Risk

The DFIRM flood zones were overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for Madera. According to this analysis, there is a total population of 1,635 and 7,342 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table B-14.

Table B-14 City of Madera – Count of Improved Residential Parcels and Population by Flood Zone

Flood Zone	Improved Residential Parcels	Population*
1% Annual Chance	428	1,635
0.2% Annual Chance)	1,922	7,342
Total	**2,350**	**8,977**

Source: FEMA 9/26/2008 DFIRM, Madera County April 2017 Parcel/Assessor's Data, US Census Bureau

* Average household populations from the 2010 US Census were used: Madera– 3.82

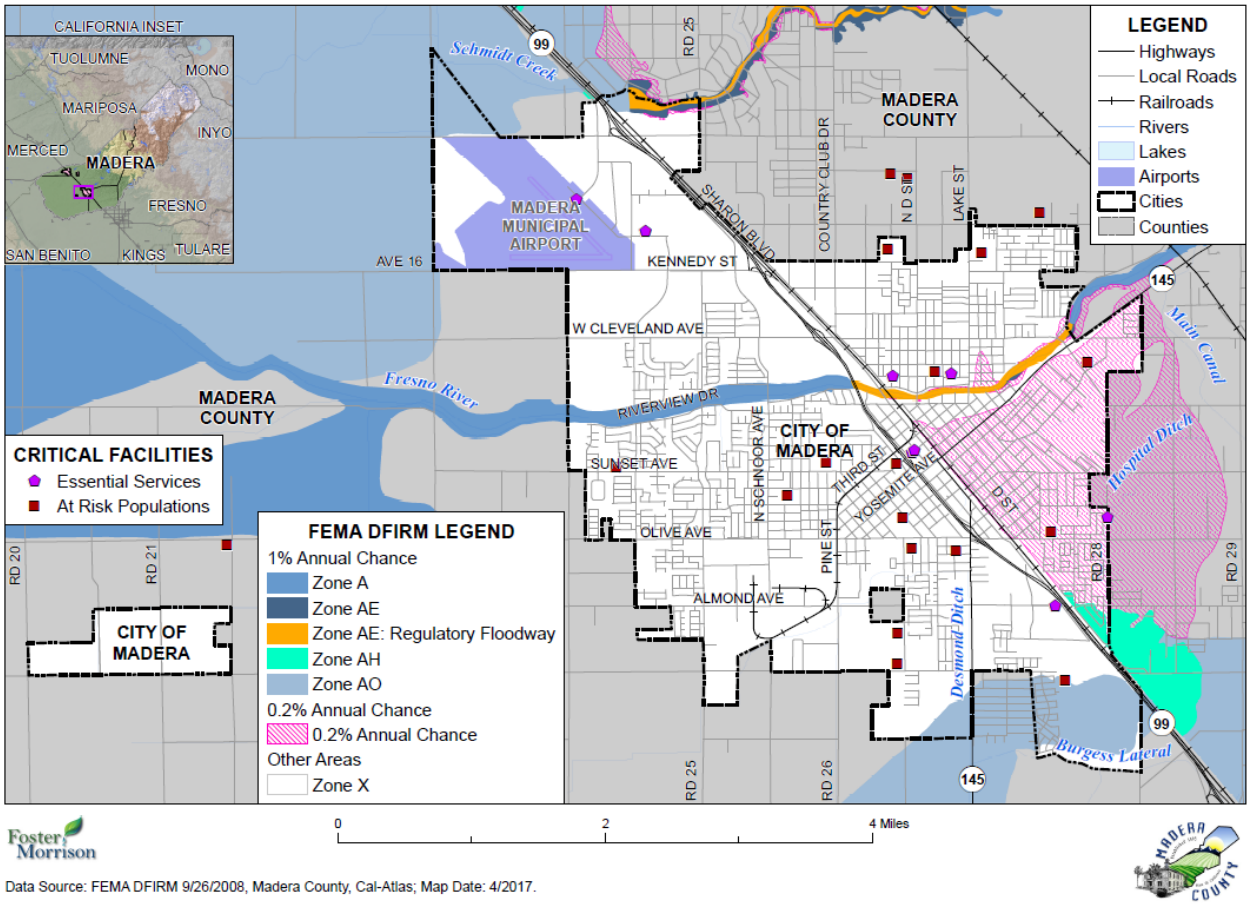
Historical, Cultural, and Natural Resources at Risk

The City of Madera has significant cultural and natural resources located throughout the City as previously described. Vulnerability analysis of these resources was not possible due to data limitations.

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Madera in identified FEMA DFIRMs. GIS was used to determine whether the facility locations intersects a DFIRM flood hazard areas, and if so, which zone it intersects. Details of critical facilities in the floodplain in the City of Madera are shown in Figure B-5 and Table B-15. As shown on the figure, Madera has one critical facility located in 1% annual chance and two in the 0.2% annual chance DFIRM flood zones. Details of critical facility definition, type, name and address and jurisdiction by flood zone are listed in Appendix E.

Figure B-5 City of Madera – Critical Facilities and Flood Zones



Data Source: FEMA DFIRM 9/26/2008, Madera County, Cal-Atlas; Map Date: 4/2017.

Table B-15 City of Madera – Critical Facilities in DFIRM Flood Zones

Critical Facility Category / Flood Zone	Critical Facility Type	Critical Facility Count
1% Annual Chance Flood Hazard		
Zone AO		
At Risk Populations	School	1
	Total	**1**
1% Annual Chance Flood Hazard Total		**1**
0.2% Annual Chance Flood Hazard (Zone X – Shaded)		
Essential Services	Fire Command Center	1
	Total	**1**
At Risk Populations	School	2
	Total	**2**
0.2% Annual Chance Flood Hazard Total		**3**

Source: FEMA 9/26/2008 DFIRM, Madera County GIS

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Madera joined the National Flood Insurance Program (NFIP) on June 4, 1987. The City does not participate in the CRS program. NFIP data indicates that as of September 19, 2016, there were 28 flood insurance policies in force in the City with $7,741,500 of coverage. Yearly premiums for flood insurance total $15,785. Of the 28 policies, 27 were residential (single-family homes), and 1 was multi-family or other residential, and none were non-residential. 5 of the policies were in A zones, and the remaining 23 were in B, C, and X zones. The GIS parcel analysis detailed above identified 298 parcels in the 100-year flood zone. 5 policies for 298 parcels in the 100-year floodplain equates to insurance coverage of 1.7 percent. There have been 8 historical claims for flood losses totaling $88,293.47. There have been no substantial damage claims in the City. There are also no repetitive loss or severe repetitive loss structures in the City.

California Department of Water Resources Best Available Maps (BAM)

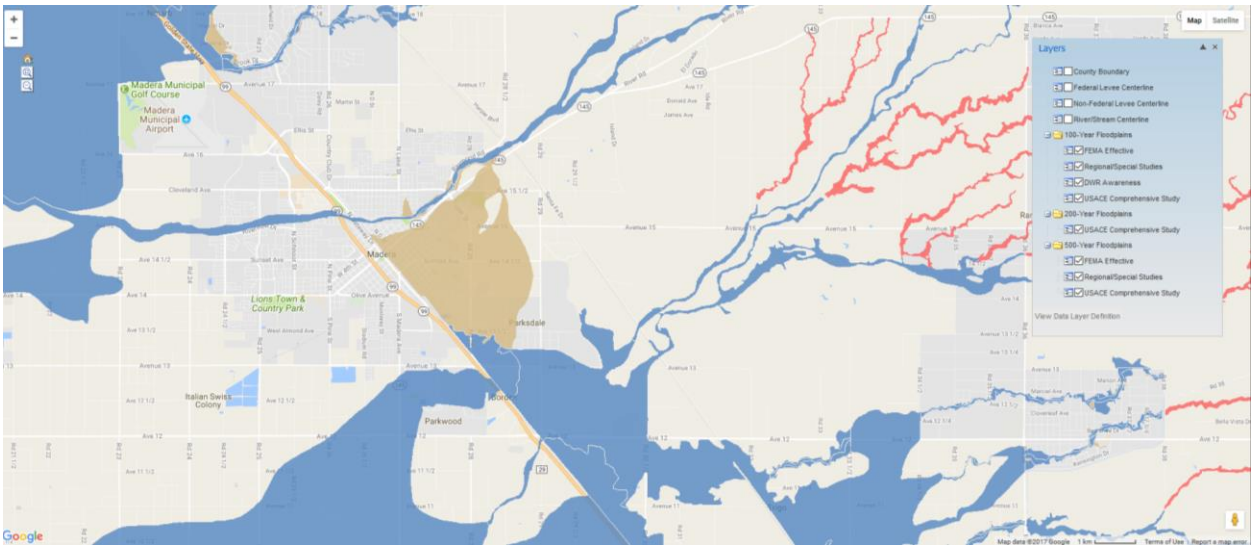
The FEMA regulatory maps provide just one perspective on flood risks in Madera County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Sacramento-San Joaquin (SAC-SJ) Valley watershed. SB 5 requires that these maps contain the best available information on flood hazards and be provided to cities and counties in the SAC-SJ Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-, and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of

potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications. They are for the same flood frequency, however, they may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 100-year floodplain, it also supports identification of the need and requirement for flood insurance. The BAM map for Madera is shown in Figure B-6.

Figure B-6 City of Madera Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 100-Year, Orange – Local 100-Year (developed from local agencies), Red – DWR 100-year (Awareness floodplains identify the 100-year flood hazard areas using approximate assessment procedures.), Pink – USACE 100-Year (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 200-Year (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 500-Year, Grey – Local 500-Year (developed from local agencies), Purple – USACE 500-Year (2002 Sac and San Joaquin River Basins Comp Study).

Future Development

The City enforces the floodplain ordinance. If any development is to occur in the floodplain, it would have to conform to the elevation standards of the floodplain ordinance. No development is expected in the floodplain in the future.

Severe Weather: Extreme Cold and Freeze

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter events can include extreme cold and freeze conditions. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Past Occurrences

The City Planning Team noted that the Central Valley as a whole generally experiences a hard freeze every two to three years. Within the City, these freezes generally lead to above-ground pipe cracking.

Vulnerability to Cold and Freeze

Extreme cold and freeze events happen in Madera County and the City of Madera each year. Extreme cold often accompanies a winter storm or is left in its wake. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers leading to power outages. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures and ice can cause accidents and road closures and can cause significant damage to the agricultural industry. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to cold and freeze include:

- Homeless
- Infants and children under age five
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

Also of concern is the impact to populations with special needs such as the elderly and those requiring the use of medical equipment. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme cold and freeze.

In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. However, many residents of the City are self-sufficient and accustomed to rural living and the climate extremes that are part of the territory.

Future Development

Future development built to code should be able to withstand snow loads from severe winter storms. Pipes at risk of freezing should be mitigated be either burying or insulating them from freeze as new facilities are improved or added. Current County codes provide such provisions for new construction. Vulnerability to extreme cold will increase as the average age of the population in the City shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the Planning Area as well as people

retiring to the area. However, as previously mentioned, many of the residents of the City are self-sufficient and accustomed to rural living.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, "Heat kills by pushing the human body beyond its limits. In extreme heat and high humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat. Conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Consequently, people living in urban areas may be at greater risk from the effects of a prolonged heat wave than those living in rural areas. Also, asphalt and concrete store heat longer and gradually release heat at night, which can produce higher nighttime temperatures known as the urban heat island effect.

Past Occurrences

The City Planning Team noted that the Central Valley as a whole experiences extreme heat each summer and sometimes into fall.

Vulnerability to Extreme Heat

Health impacts are the primary concern with this hazard, though economic impacts are also an issue. The elderly and individuals below the poverty level are the most vulnerable to extreme temperatures. Nursing homes and elder care facilities are especially vulnerable to extreme heat events if power outages occur and air conditioning is not available. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not affordable.

Reliance on air conditioning causes a strain on the electrical energy in the Madera area. Occasionally peak demands outweigh supply and a condition known as brown-out occurs. This is an extremely dangerous situation for electrical equipment as it operates without the needed electricity causing damage to the systems. Days of extreme heat have been known to result in medical emergencies, civil unrest, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts.

Future Development

Vulnerability to extreme heat will increase as the average age of the population in each City shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the City. The elderly are more at risk to the effects of extreme heat, especially those without proper air conditioning. However,

many of the residents of the City are accustomed to living with extreme heat and take precautions to guard against the threat of extreme heat.

Severe Weather: Fog

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

The San Joaquin Valley can produce some extremely dangerous fogs in the winter and early spring months. These are a type of radiation fog called "tule fog." Tule fog forms on cold and clear nights, when the ground is moist and there is very little wind. Under such conditions the ground cools quickly and thus cools the air above it as well. The moisture in this cooled air condenses and can create extremely dense fog. Since the air may be stagnant and there is little evaporative effect from the sun in winter months, tule fogs can last for several days and, in some instances, over a week. Under these conditions, visibility is often reduced to 600 feet, but can drop to less than 10 feet.

Past Occurrences

The City Planning Team note that the Central Valley experiences fog routinely during the winter months. Generally, foggy conditions that preclude safe travel occur two to three times per year.

Vulnerability to Fog

Tule fog is likely to occur annually during the winter months in low-lying regions of the County of Madera, including the City of Madera. When tule fog forms, a severe risk is posed to traffic with the potential for multi-car pileups, especially on Highway 99. This may have an economic impact on the City due to delays in transportation times or even the shutting down of Highway 99. The same dense and lingering fog can also produce adverse health effects in those with respiratory ailments.

Future Development

Many of the residents of the City are accustomed to living with fog and take precautions to guard against the threat of fog, such as slowing down while traveling.

Severe Weather: Heavy Rains and Storms (winds, hail, and lightning)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to historical hazard data, severe weather is an annual occurrence in the City of Madera. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future.

Heavy rain and thunderstorms are the most frequent type of severe weather occurrence in the area. Wind and lightning often accompany these storms and have caused damage in the past.

Past Occurrences

The City Planning Team noted that the City experiences generally at least one heavy rainfall event each winter, however it hasn't gone past the level of a 25-year storm in several years. The rainfall causes localized flooding.

Vulnerability to Heavy Rains and Storms

Problems associated with the primary effects of severe weather include flooding, pavement deterioration, washouts, high water crossings, landslide/mudslides, debris flows, and downed trees. Most of the localized flooding in the City is generally limited to flooding within the street ROW and only has limited impact to private property. It is anticipated that a 100-year rainfall event would impact private facilities to varying degrees in various parts of the City.

Future Development

The City enforces the state building code and other ordinances, which regulate construction techniques that minimize damage from heavy storms and rain. Future development in the City is subject to these building codes. New critical facilities such as communications towers should be built to withstand hail damage, lightning, and heavy rains.

Severe Weather: Wind and Tornado

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

On an annual basis, the City of Madera experiences severe storms accompanied by strong wind and wind gusts. High winds combined have caused significant damage to public infrastructure (primarily the electric grid). In the City of Madera high winds occur in the winter, generally from November through March, although high winds may also occur in other months.

Past Occurrences

The City Planning Team noted no past occurrences of wind and tornado that had damaging effects on the City.

Vulnerability to Wind and Tornadoes

Strong wind is a frequent type of severe weather occurrence in the area. Wind often accompanies the region's storms and has caused damage in the past. Buildings that house populations at risk such as schools, nursing homes, hospitals, and urgent care facilities are at risk to wind and tornadoes. Also at risk are power

lines, which can arc or be damaged during high wind events. The City has had power outages and damages to electric lines in past storms.

Future Development

The City enforces the state building code and other ordinances, which regulate construction techniques that minimize damage from high winds. Future development in the City is subject to these building codes.

Severe Weather: Winter Storms/Snow

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snow storms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, closing roads, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result.

Past Occurrences

The City Planning Team noted no notable snow events have occurred in recent history. Hail and light snowfall have occurred, however accumulation of snow and/or hail generally does not occur within the City on the valley floor.

Vulnerability to Winter Storms and Snow

The western portion of the Madera County Planning Area, where the City of Madera is located, does experience rare snowfall on a seasonal basis; mostly between the months of November through March. Winter weather can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the City. The ability for the City to continue to operate during periods of winter storm and snow is paramount. Vulnerable populations to winter storms and snow include:

- Homeless
- Infants and children under age five

- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

However, many residents of the City are self-sufficient and accustomed to the climate extremes that are part of the territory. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of winter storm and heavy snows.

Other impacts to the City as a result of winter snow storms include damage to infrastructure, frozen pipes, utility outages, road closures, traffic accidents, and interruption in business and school activities. Also of concern is the impact to populations with special needs such as the elderly and those requiring the use of medical equipment. Delays in emergency response services can be of significant concern. Further, there are economic impacts associated with areas prone to heavy snow. Although the eastern portion of the county is the most vulnerable to the effects of snow, snowfall occurring in the lower elevations can create significant issues, as residents working and living in those areas may not be as prepared for snowfall.

Future Development

Future development built to code should be able to withstand snow loads from severe winter storms. Current City codes provide such provisions for new construction. Vulnerability to winter snow storms will increase as the average age of the population in the County shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the City and surrounding area.

Wildfire

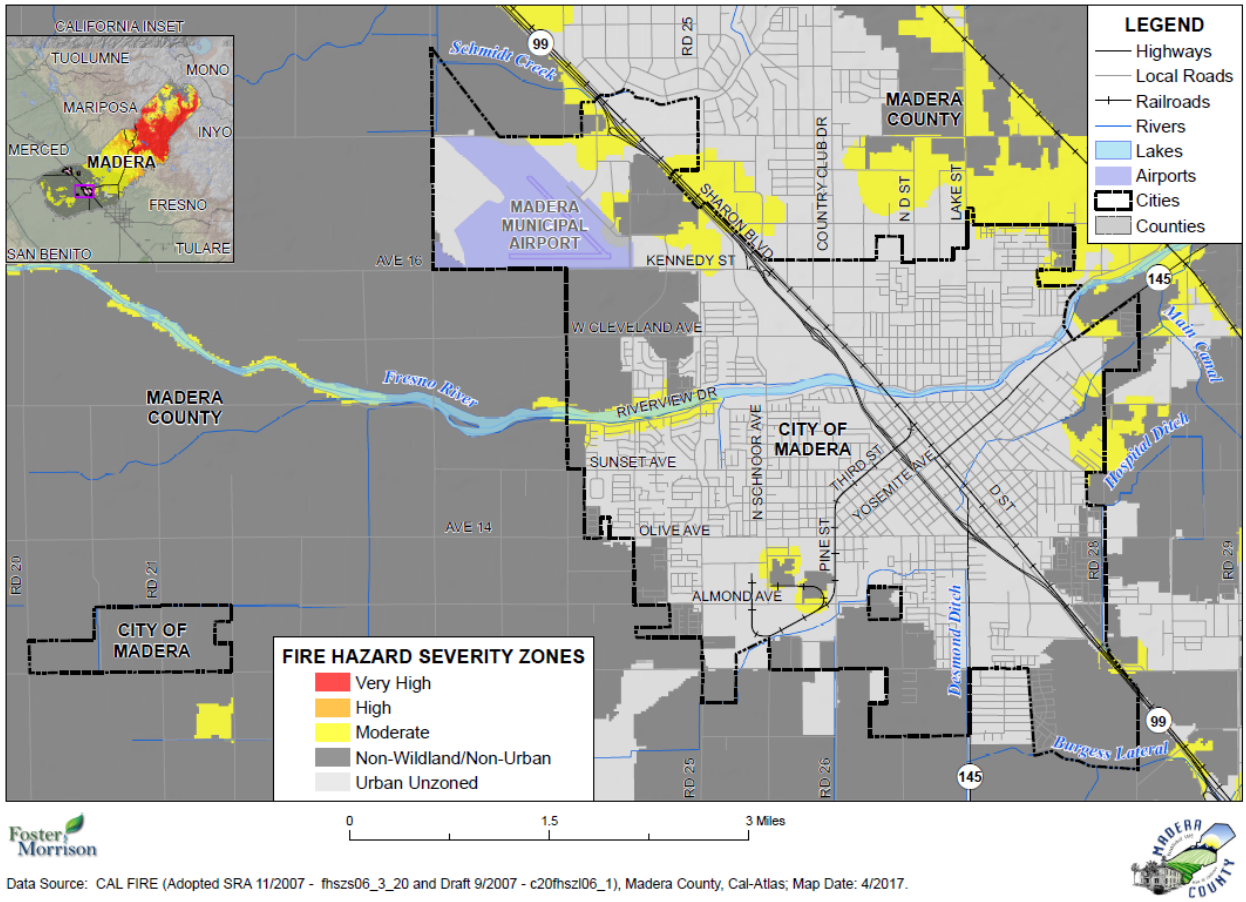
Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Although rated as low by the City Planning Team, due to wildfire's importance in the County and the State of California, it is included here. Wildfires can cause short-term and long-term disruption to the County. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the County by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires may result in casualties and can destroy buildings and infrastructure.

Following the methodology described in Section 4.3.2 Vulnerability of Madera County to specific hazards, a wildfire map for the City of Madera was created (see Figure B-7). Wildfire threat within the city ranges from low to moderate. The highest threat occurs along the eastern edge of the city.

Figure B-7 City of Madera's Fire Severity Zones



Data Source: CAL FIRE (Adopted SRA 11/2007 - fhszs06_3_20 and Draft 9/2007 - c20fhszl06_1), Madera County, Cal-Atlas; Map Date: 4/2017.

Past Occurrences

The City Planning Team noted that there are no notable wildfire events within the City limits within recent history. Vegetation fires occur during the dry months but these are small and quickly contained.

Vulnerability to Wildfire

Values at Risk

Analysis results for Madera are shown in Table B-16, which summarizes total parcel counts, improved parcel counts and their structure values by occupancy type as well as the percentage of parcels affected by fire.

Table B-16 City of Madera – Count and Value of Parcels by Property Use and Fire Severity Zone

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
Very High						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Utilities	0	0	$0	$0	$0	$0
Unknown	0	0	$0	$0	$0	$0
Very High Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**
High						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Utilities	0	0	$0	$0	$0	$0
Unknown	0	0	$0	$0	$0	$0
High Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**
Moderate						
Agricultural	9	1	$450,697	$73,549	$73,549	$597,795
Commercial	28	15	$7,763,191	$10,579,302	$10,579,302	$28,921,795
Government	3	0	$3,814	$0	$0	$3,814
Industrial	15	4	$2,438,666	$5,557,179	$8,335,769	$16,331,614
Institutional	0	0	$0	$0	$0	$0
Residential	584	517	$21,609,599	$64,078,678	$32,039,339	$117,727,616
Utilities	14	0	$8,959	$0	$0	$8,959
Unknown	3	0	$1	$0	$0	$1
Moderate Total	**656**	**537**	**$32,274,927**	**$80,288,708**	**$51,027,959**	**$163,591,594**
Non-Wildland/Non-Urban						
Agricultural	26	14	$13,929,785	$995,381	$995,381	$15,920,547
Commercial	20	4	$5,549,304	$3,031,372	$3,031,372	$11,612,048

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
Government	17	2	$2,879,561	$16,797	$16,797	$2,913,155
Industrial	81	10	$9,695,627	$13,359,401	$20,039,102	$43,094,130
Institutional	2	2	$379,863	$573,507	$573,507	$1,526,877
Residential	1,999	1,640	$93,368,776	$226,511,495	$113,255,748	$433,136,019
Utilities	33	0	$6,700	$0	$0	$6,700
Unknown	2	0	$46,074	$0	$0	$46,074
Non-Wildland/Non-Urban Total	**2,180**	**1,672**	**$125,855,690**	**$244,487,953**	**$137,911,906**	**$508,255,549**
Urban Unzoned						
Agricultural	19	6	$1,219,164	$306,445	$306,445	$1,832,054
Commercial	963	737	$136,464,063	$366,677,944	$366,677,944	$869,819,951
Government	120	5	$5,018,860	$1,189,976	$1,189,976	$7,398,812
Industrial	142	94	$16,902,229	$86,687,927	$130,031,891	$233,622,047
Institutional	82	61	$2,968,566	$22,866,258	$22,866,258	$48,701,082
Residential	11,635	11,008	$418,264,286	$1,180,790,742	$590,395,371	$2,189,450,399
Utilities	186	4	$431,904	$305,052	$305,052	$1,042,008
Unknown	68	8	$5,875,863	$5,795,090	$5,795,090	$17,466,043
Urban Unzoned Total	**13,215**	**11,923**	**$587,144,935**	**$1,664,619,434**	**$1,117,568,027**	**$3,369,332,396**
Grand Total	**16,051**	**14,132**	**$745,275,552**	**$1,989,396,095**	**$1,306,507,891**	**$4,041,179,538**

Source: Madera County April 2017 Parcel/Assessor's Data, CAL FIRE

Population at Risk

The Fire Severity Zone dataset was overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for each jurisdiction and unincorporated area. Results were tabulated by jurisdiction. According to this analysis, there is a total population of 91 residents of Madera at risk to moderate or higher wildfire risk. This is shown in Table B-17.

Table B-17 City of Madera – Count of Improved Residential Parcels and Population by Fire Severity Zone

Fire Severity Zone	Improved Residential Parcels	Population*
Very High	0	0
High	0	0
Moderate	517	1,975
Total	**517**	**1,975**

Source: Madera County April 2017 Parcel/Assessor's Data, CAL FIRE

* Average household populations for Madera (3.82) from the 2010 US Census were used

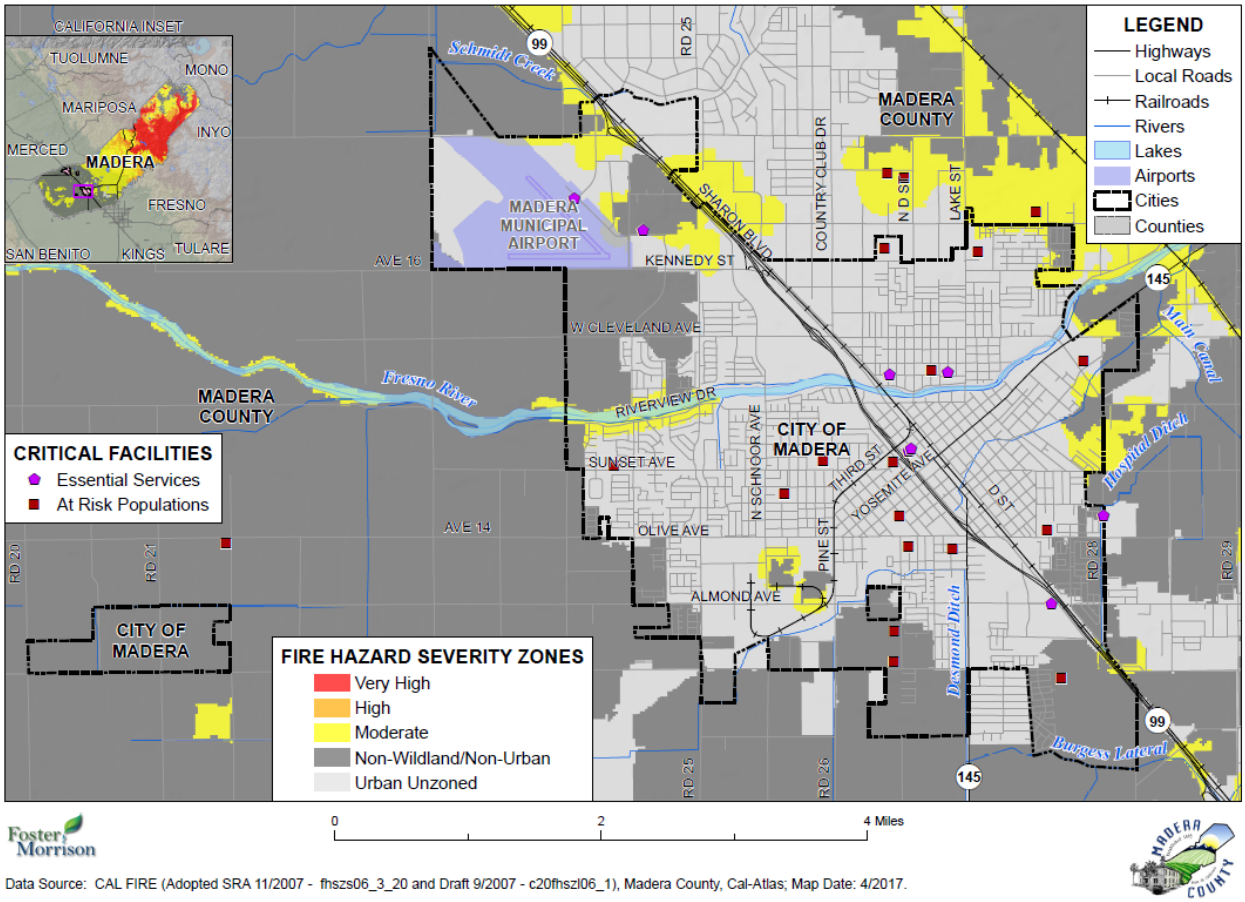
Historical, Cultural, and Natural Resources at Risk

The City of Madera has significant cultural and natural resources located throughout the City as previously described. Vulnerability analysis of these resources was not possible due to data limitations.

Critical Facilities at Risk

Wildfire analysis was performed on the critical facility inventory in Madera County and all jurisdictions. GIS was used to determine whether the facility locations intersect a fire severity zone provided by CAL FIRE, and if so, which zone it intersects. There are no facilities in the moderate or higher fire severity zone in the City. These are shown in Figure B-8. Details of critical facility definition, type, name and address and jurisdiction by fire severity zone are listed in Appendix F.

Figure B-8 City of Madera – Critical Facilities in the Fire Severity Zone



Data Source: CAL FIRE (Adopted SRA 11/2007 - fhszs06_3_20 and Draft 9/2007 - c20fhszl06_1), Madera County, Cal-Atlas; Map Date: 4/2017.

Future Development

There are small patches of moderate fire hazard zones in the City. Development may occur in the moderate or higher wildfire severity areas; however, City ordinances for building in these areas are enforced.

B.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

B.6.1. Regulatory Mitigation Capabilities

Table B-18 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Madera.

Table B-18 City of Madera's Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Y 2014	Storm Drainage Master Plan, yes to all questions
Capital Improvements Plan	Y 2017/18	Yes to all questions – as funded.
Economic Development Plan		
Local Emergency Operations Plan	Y 2017	Yes to all questions
Continuity of Operations Plan	Y 2017	
Transportation Plan	Y 2009	Within General Plan
Stormwater Management Plan/Program	Y 2014	Storm drainage master plan. Yes to all questions.
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	N	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	Climate action plan.
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	Y	Version/Year: 2016
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:	Y	Rating: 4
Site plan review requirements	Y	Yes as required by Planning or Engineering
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	Y	It is effective and enforced.
Subdivision ordinance	Y	It is effective and enforced.
Floodplain ordinance	Y	It is effective and enforced.
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	Y	
Elevation Certificates	Y	Included in proposed update to Floodplain Management Ordinance
Acquisition of land for open space and public recreation uses	N	The City does not have a Quimby Act Ordinance

Erosion or sediment control program	N
Other	
How can these capabilities be expanded and improved to reduce risk?	
They can be reviewed routinely for necessary updates and modifications.	

Source: City of Madera

2009 City of Madera General Plan

In 2009, after an extensive visioning process and public comment, the City adopted an updated General Plan which "represents the product of years of efforts on the part of residents and businesses in the community working to maintain and improve Madera's quality of life and implement the community's shared vision for the future".

The General Plan serves as the City's blueprint for long term development. The General Plan contains goals, policies and implementation strategies that address Madera's growth and the quality of life of its residents. The General Plan is organized into chapters, or elements, that cover specific topics. Madera's Plan covers all of the mandatory features required by the State of California, as well as several optional topics that were emphasized through Vision 2025. A total of ten topical elements are included in the Madera General Plan: Community Design, Circulation and Infrastructure, Conservation, Health and Safety, Housing, Land Use, Noise, Historic and Cultural Resources, Parks and Recreation, and Sustainability.

These goals and policies adopted as part of the General Plan are the standards that all new development in the City is measured by. The City must find that new project proposed within the City limits are consistent with the General Plan as part of any approval process

The General Plan includes a Health and Safety Element that focuses on safety issues to be considered in planning for the present and future development of the Madera Planning Area. Identified hazards include dam failure, geologic/seismic, flooding, and other natural and man-made hazards. Mitigation-related goals are presented below.

Health and Safety Element Goals	
Goal HS-1	A safe and healthy environment for all Maderans that includes: clean air and water; adequate levels of police and fire protection; safe housing; and safe places to work and play.
Goal HS-2	A healthy and fit population with access to health care, healthful food, and places to be active and exercise.
Goal HS-3	Working with other agencies to protect residents and businesses from hazards caused by flooding.
Goal HS-4	Working with other agencies to protect and manage natural drainage ways, floodplains and flood retention basins, to maintain flood carrying capacity in harmony with environmental, recreational and open space objectives.

Mitigation Related Ordinances

Emergency Services (Title III, Chapter 2)

The declared purposes of this chapter are to provide for the preparation and carrying out of plans for the protection of persons and property within the city in the event of an emergency or disaster and to provide for the coordination of the emergency functions of the city with all public agencies and affected private persons, corporations, and organizations. Any expenditures made in connection with such emergency and disaster activities, including mutual aid activities, shall be deemed conclusively to be for the direct protection and benefit of the inhabitants and property of the City.

Buildings Regulations (Title IX)

This Title lays out the regulations the City places on the construction of buildings. Pursuant to Cal. Gov't Code § 50022.1 through 50022.6, the texts of those certain publications of the International Conference of Building Officials, the International Association of Plumbing and Mechanical Officials, the Western Fire Chiefs Association and the National Fire Protection Association, together with parts of the appendices thereto, the 2007 California Building Code, based on the 2006 International Building Code, the 2007 California Mechanical Code, based on the 2006 Uniform Mechanical Code, the 2007 California Fire Code, based on the 2006 International Fire Code, the 2007 California Plumbing Code, based on the 2006 Uniform Plumbing Code, the Uniform Swimming Pool, Spa and Hot Tub Code - 2006 Edition, the 2007 California Electrical Code, based on the 2005 National Electrical Code, the 2007 Energy Code, the 2009 International Property Maintenance Code, the 1997 Uniform Code for the Abatement of Dangerous Buildings, and the 2006 International Existing Building Code are hereby adopted as the rules, regulations and standards within this city as to all matters therein contained except as herein otherwise provided. The mandatory requirements of the listed appendices to such codes shall be enforceable to the same extent as if contained in the body of such Code of said regulations and one copy of said regulations are and shall be at all times kept on file with the office of the City Clerk in accordance with Cal. Gov't Code § 50022.6.

Subdivisions (Title X, Chapter 2)

It is the purpose of this chapter to regulate and control the division of land within the city and to supplement the provisions of the Subdivision Map Act concerning the design, improvement, and survey data of subdivisions, the form and content of all maps provided for by the Subdivision Map Act and the procedure to be followed in securing the official approval of the Development Review Committee, Planning Commission, the Planning Department, and City Council regarding such maps. To accomplish this purpose, the regulations outlined in this chapter are determined to be necessary for the preservation of the public health, safety, and general welfare, to promote orderly growth and development and to promote open space, conservation, protection, and proper use of land and to insure provision for adequate traffic circulation, utilities, and services.

Zoning (Title X, Chapter 3)

An official land use plan for the city is adopted and established to promote the growth of the city in an orderly manner and to promote and protect the public health, safety, peace, comfort, and general welfare, and to provide the economic and social advantages resulting from an orderly planned use of land resources

Floodplain Management (Title III, Chapter 3)

This chapter applies to all areas of special flood hazard, areas of flood-related erosion hazards, and areas of mud flow hazards identified by the Federal Emergency Management Agency or the Federal Insurance Administration in a scientific and engineering report entitled "Flood Insurance Study for the City of Madera, California" dated September 26, 2008, with an accompanying Flood Insurance Rate Map which is on file with the office of the City Clerk and to which reference is made. This Flood Insurance Study is a minimum area of applicability of this chapter and may be supplemented by studies for other areas which allow implementation of this chapter and which are recommended to the City Council by the Flood Plain Administrator.

No structure or land shall hereafter be constructed, located, extended, converted, or altered without full compliance with all of the rules, requirements, terms, and provisions of a resolution of the City Council which shall be adopted pursuant to this chapter to implement this chapter.

Weed Abatement Regulations (Title III, Chapter 3-15)

The purpose of this chapter is to protect citizens and residential neighborhoods of the city from noxious weeds and wildfire. The chapter is essential for maintaining the city healthy, clean, and safe from any pernicious, natural and/or unnatural materials, including without limitations weeds, rubbish, dirt, and/or brush which constitute a public nuisance.

B.6.2. Administrative/Technical Mitigation Capabilities

Table B-19 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Madera.

Table B-19 City of Madera's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Public Works and Parks
Mutual aid agreements	Y	
Other		

Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y FT	Staffing is adequate and trained. Coordination is effective.
Floodplain Administrator	Y FT	Staffing is adequate and trained. Coordination is effective.
Emergency Manager	Y FT	Staffing is adequate and trained. Coordination is effective.
Community Planner	Y FT	Staffing is adequate and trained. Coordination is effective.
Civil Engineer	Y FT	Staffing is adequate and trained. Coordination is effective.
GIS Coordinator	N	
Other		
Technical	**Y/N**	**Describe capability Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Nixel and NextDoor apps; coordination with County Sheriff for Everbridge
Hazard data and information	N	
Grant writing	Y	
Hazus analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Source: City of Madera

B.6.3. Fiscal Mitigation Capabilities

Table B-20 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table B-20 City of Madera's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Annual CIP budget adopted by Council
Authority to levy taxes for specific purposes	Y	With public vote
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
Storm water utility fee	Y	

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Incur debt through general obligation bonds and/or special tax bonds	Y	The City can, but generally does not.
Incur debt through private activities	N	
Community Development Block Grant	Y	
Other federal funding programs	Y	
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		

Source: City of Madera

B.6.4. Mitigation Education, Outreach, and Partnerships

Table B-21 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information. More information can be found below the table. CAN THE TABLE BE FILLED OUT? – THERE WAS A QUESTION WHERE THESE COME FROM. USUALLY JURISDICTIONS DO SOME OF THE ITEMS BELOW AS A PARTNERSHIP WITH OTHER ORGANIZATIONS.

Table B-21 City of Madera's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)		
Natural disaster or safety related school programs		
StormReady certification		
Firewise Communities certification		
Public-private partnership initiatives addressing disaster-related issues		
Other		
How can these capabilities be expanded and improved to reduce risk?		

B.7 Mitigation Strategy

B.7.1. Mitigation Goals and Objectives

The City of Madera adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

B.7.2. NFIP Mitigation Strategy

The City of Madera joined the National Flood Insurance Program (NFIP) on June 4, 1987. As a participant of the NFIP, the City of Madera has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Madera will continue to comply with the requirements of the NFIP in the future. In addition, the City of Madera actively participates with the County to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Madera as for Madera County since participation at the County level includes all local jurisdictions.

The City's regulatory activities apply to existing and new development areas of the City; implementing flood protection measures for existing structures and new development, and maintaining drainage systems. The goal of the program is to enhance public safety, and reduce impacts and losses while protecting the environment. The City's Municipal Code has a Flood Damage Prevention Section under the Zoning Ordinance that regulates construction in the floodplain. The City intends to continue to implement the ordinance and participate at the regional level with Madera County implementing appropriate measures to mitigate exposure and damages within designated flood prone areas.

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Madera is not a current participant in the CRS program.

More information about the floodplain administration in the City of Madera can be found in Table B-22.

Table B-22 City of Madera Compliance with NFIP

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	28 policies $15,785 in annual premiums $7,741,500 of coverage in force
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	8 paid losses $88,293n paid claims 0 substantial damage claims

NFIP Topic	Comments
How many structures are exposed to flood risk within the community?	298 (1% annual chance flood) 2,157 (0.2% annual chance flood)
Describe any areas of flood risk with limited NFIP policy coverage	None know.
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	Y
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review, inspections, engineering capability, respond to public inquiry
What are the barriers to running an effective NFIP program in the community, if any?	Funding
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	7/21/2016
Is a CAV or CAC scheduled or needed?	N
Regulation	
When did the community enter the NFIP?	1987
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet
Provide an explanation of the permitting process.	An expanded permitting process is included in the upcoming update to the floodplain management ordinance. It is a multi-step process that has several levels of review
Community Rating System	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	–
What categories and activities provide CRS points and how can the class be improved?	–
Does the plan include CRS planning requirements?	–

B.7.3. Mitigation Actions

The planning team for the City of Madera identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: All hazards

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140).

Project Description: Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: City of Madera Planning Department

Priority: High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Timeline: As soon as possible

Action 2. Installation of variable frequency drives onto wells to increase capacity

Hazards Addressed: Drought & Water Supply

Goals Addressed: 1, 2, 3, 5, 7

Issue/Background: To better regulate the water supply to increase efficiency (not capacity) on high production wells.

Project Description: Well 20, Well 21

Other Alternatives: No action.

Existing Planning Mechanisms through which Action will be Implemented:

Responsible Office: City & County

Priority: Medium

Cost Estimate: $25,000 each ($50,000 total)

Potential Funding: To be determined

Benefits (avoided Losses): Water pressure spikes and dips.

Timeline: 1-2 years

Action 3. Install backup motors for wells with an emphasis on critical facilities. Provide backup generators for wells.

Hazards Addressed: Drought & Water Supply/ Earthquakes

Goals Addressed: 1, 2, 3, 5, 7

Issue/Background: Ensure water distribution is preserved during natural disasters.

Project Description: City to purchase more backup generators for critical wells (3).

Other Alternatives: CNG Motors.

Existing Planning Mechanisms through which Action will be Implemented:

Responsible Office: City Public Works, City Engineering & County

Priority: Medium

Cost Estimate: $100,000 each ($300,000 total)

Potential Funding: To be determined

Benefits (avoided Losses): Critical wells will still pump if electricity is lost.

Timeline: 3 years

Action 4. Install Variable Frequency Drives (VFD) on Existing City Wells to Increase Capacity

Hazards Addressed: Drought, Water Supply

Goals Addressed: 1, 2, 3, 5, 7

Issue/Background: Addresses capacity of wells as they are impacted by fluctuating water levels. Installation of these improvements are more directly affect the anticipated long term drop in water levels. Without the use of VFDs, the efficiency of wells decreases as water levels drop. VFDs compensate for this lowering of the water level.

Project Description: Install VFDs at wells where water level fluctuation has shown a decrease in well efficiency. Installation of VFDs shall proceed at wells most susceptible to this affect.

Other Alternatives: No action.

Existing Planning Mechanisms through which Action will be Implemented: City's Capital Improvement Program

Responsible Office: City Engineering Department

Priority: High

Cost Estimate: $160,000 (first 4 wells that have been identified)

Potential Funding: To be determined

Benefits (avoided Losses): Avoidance of property damage and to a lesser degree injuries associated with flood events

Timeline: 2 years for initial wells

Action 5. Provide Backup Generators for City Wells

Hazards Addressed: Earthquake, Water Supply

Goals Addressed: 1, 2, 3, 5, 7

Issue/Background: Earthquakes, and other natural disasters, have potential to cause widespread power outages that may interfere with City's ability to deliver water to residents and businesses.

Project Description: Install generators at well in accordance with recommendation provided in the City's Water System Master Plan

Other Alternatives: No action.

Existing Planning Mechanisms through which Action will be Implemented: City's Water System Master Plan and Capital Improvement Program

Responsible Office: City Engineering Department

Priority: Medium

Cost Estimate: $1,200,000 (8 generators)

Potential Funding: Water Rates (assuming sufficient reserve exist)

Benefits (avoided Losses): Preserve ability to provide potable, and to a minimal degree, irrigation water to residents

Timeline: 2-10 years

Action 6. Implement Improvements Recommended in the Storm Drainage System Master Plan

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 6, 7

Issue/Background: Addresses flooding concerns/issues within the City of Madera that range from nuisance flooding to larger events that may cause significant property damage.

Project Description: Install unfunded improvements identified in the Storm Drainage System Master Plan, on a prioritized basis.

Other Alternatives: No action.

Existing Planning Mechanisms through which Action will be Implemented: City's Storm Drainage System Master Plan and Capital Improvement Program

Responsible Office: City Engineering Department

Priority: High

Cost Estimate: $45,000,000

Potential Funding: To be determined

Benefits (avoided Losses): Avoidance of property damage and injuries associated with flood events

Timeline: 2 to 25 years

Action 7. 4th Street Flooding Improvements Installed in accordance with that recommended in the Storm Drainage System Master Plan

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 6, 7

Issue/Background: Addresses flooding concerns/issues within the 4th Street right-of-way near City Hall.

Project Description: Install unfunded improvements identified in the Storm Drainage System Master Plan.

Other Alternatives: No action.

Existing Planning Mechanisms through which Action will be Implemented: City's Storm Drainage System Master Plan and Capital Improvement Program

Responsible Office: City Engineering Department

Priority: High

Cost Estimate: $2,000,000

Potential Funding: Grants

Benefits (avoided Losses): Avoidance of property damage and to a lesser degree injuries associated with flood events

Timeline: 2 to 5 years

Action 8. Conduct New Studies/Modeling and Mapping of the Fresno River within the City's Growth Boundary

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 6, 7

Issue/Background: Portion of the river are not modeled while other portions appear to be dated with respect to current understanding of what a 100-year storm may represent. As such, an accurate understanding of flooding risks may not be available.

Project Description: Perform modeling of the Fresno River with the City's growth boundary. Update FIRM maps as may be necessary to incorporate revised flood zones.

Other Alternatives: No action.

Existing Planning Mechanisms through which Action will be Implemented: City's Capital Improvement Program - Action is required to include this in this document.

Responsible Office: City Engineering Department

Priority: Medium

Cost Estimate: $150,000

Potential Funding: Grants

Benefits (avoided Losses): Preserve ability to provide potable, and to a minimal degree, irrigation water to residents as supplies may be affected during periods of drought

Timeline: 2-10 years

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Appendix C
Adoption Resolution

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