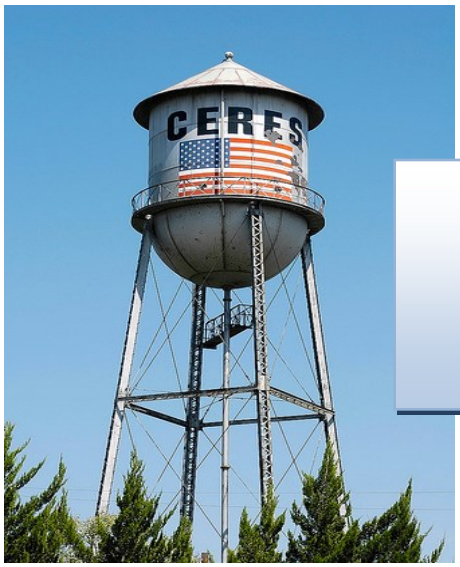

June 2016

City of Ceres

2015 Urban Water Management Plan

2015 Urban Water Management Plan

Prepared by the

City of Ceres

June 2016

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List of Acronyms and Abbreviations

µg/L	Micrograms Pere Liter
AB	Assembly Bill
Act	Urban Water Management Planning Act
AF	Acre-Feet
AFY	Acre-Feet Per Year
AMI	Automated Metering Infrastructure
Baseline GPCD	Baseline Gallons Per Capita Per Day
BMPs	Best Management Practices
CDoF or DOF	California Department of Finance
CEQA	California Environmental Quality Act
CII	Commercial, Institutional, and Industrial
City	City of Ceres
CIWQS	California Integrated Water Quality System
CMC	Ceres Municipal Code
CUWCC	California Urban Water Conservation Council
CVCWA	Central Valley Clean Water Association
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
CWC	California Water Code
DBCP	Dibromochloropropane
DMC	Delta-Mendota Canal
DMMs	Demand Management Measures
DPRP	Drought Preparedness and Response Plan
DPWD	Del Puerto Water District
DWR	Department of Water Resources
DWR 2015 Guidebook	2015 Urban Water Management Plans Guidebook for Urban Water Suppliers
ECI	Environmental Compliance Inspector
EDB	Ethylenedibromide
EPA	U.S. Environmental Protection Agency
e-WRIMS	Electronic Water Rights Information Management System
FERC	Federal Energy Regulatory Commission
GMP	Groundwater Management Plan
GPCD	Gallons Per Capita Per Day
Gpf	Gallons Per Flush
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
ILP	Integrated Licensing Process
IPCC	Intergovernmental Panel on Climate Change
M&I	Municipal and Industrial
MCL	Maximum Contaminant Level
MG	Million Gallons
mg/L	Milligrams Per Liter
MGD	Million Gallons Per Day
MGY	Million Gallons Per Year
MID	Modesto Irrigation District
MOU	Memorandum of Understanding
MWELO	Model Water Efficient Landscape Ordinance
NVRRWP	North Valley Regional Recycled Water Program
O&M	Operation and Maintenance
RSWSP	Regional Surface Water Supply Project
RUWMP	Regional Urban Water Management Plan

RWQCF	Regional Water Quality Control Facility
SB	Senate Bill
SB C7-7	Water Conservation Act of 2009
SED	Substitutive Environmental Document
SGMA	Sustainable Groundwater Management Act of 2014
SRWA	Stanislaus Regional Water Authority
SWRCB	State Water Resource Control Board
TDS	Total Dissolved Solids
TGBA	Turlock Groundwater Basin Association
TID	Turlock Irrigation District
UAFW	Unaccounted for Water
WEC	Walnut Energy Center
WSCP	Water Shortage Contingency Plan
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

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ES.1 INTRODUCTION

Over the last several years, Urban Water Management Plans (UWMPs) have assumed a very important role in water supply planning and management for communities in California. UWMPs have become the foundational documents which cities and water agencies use to develop water supply assessments and other key water supply reliability documents in support of providing water service to existing customers and future development in accordance with adopted General Plans and established Spheres of Influence.

With the current unprecedented water supply conditions in California, development of the 2015 UWMPs comes at a pivotal time. Current drought conditions have resulted in unprecedented state mandates for water conservation and have led to the passage of the Sustainable Groundwater Management Act of 2014. These actions will impact all water suppliers and all water users in the State. With the improving economy statewide, the need for reliable water supplies to serve existing customers, as well as new development, is more critical than ever. Also, 2015 is the first compliance year for the interim water use targets required by the Water Conservation Act of 2009 (SB X7-7).

As described in this 2015 UWMP, the City of Cere's (City's) residents and businesses have responded positively to the call for water conservation and the City continues to be committed to the implementation of good water management practices to ensure that adequate, reliable water supplies are available to meet existing and projected demands. The City has met its interim 2015 per capita water use target and is well positioned to meet the final 2020 water use target per capita water demand.

ES.2 WATER CODE REQUIREMENTS

The Urban Water Management Planning Act (UWMP Act) requires water suppliers that provide over 3,000 acre-feet per year or have over 3,000 connections to prepare and submit to the State Department of Water Resources (DWR) an Urban Water Management Plan every five (5) years.

The UWMP Act has been modified over the years in response to the State's water shortages, droughts and other factors. A significant amendment was made in 2009, after the 2007 to 2009 drought, and as a result of the Governor's call for a statewide 20 percent reduction in urban water use by the year 2020. This was the Water Conservation Act of 2009, also known as SB X7-7. This act required agencies to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020.

The primary objective of the UWMP Act is to direct "urban water suppliers" to develop an UWMP which provides a framework for long-term water supply planning and documents how urban water suppliers are carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future water demands.

In 2015, the City supplied approximately 2,104 million gallons (MG) of potable water to approximately 11,625 residential and non-residential connections located within its water service

area. The City is therefore considered an urban water supplier and is required to submit an UWMP. This 2015 UWMP describes the City water system, historical and projected water use, water supply sources, and a comparison of projected water supply to water demands during normal, single-dry, and multiple-dry years in five-year increments from 2020 to 2035. As required by SB X7-7, this 2015 UWMP also confirms the City's 2015 and 2020 water use targets, verifies the City's compliance with the interim 2015 water use target, and describes the City's implementation plan for meeting the City's final 2020 water use target.

The City's 2015 UWMP (or Plan) has been prepared in accordance with the UWMP Act, as defined by the California Water Code, Division 6, Part 2.6, Sections 10610 through 10656 (Urban Water Management Planning), and the Water Conservation Act of 2009 (WC Act, also known as SB X7-7), as defined by California Water Code, Division 6, Part 2.55, Section 10608 (Sustainable Water Use and Demand Reduction). A copy of the relevant sections of the Water Code is included in Appendix A of this document.

A brief summary of this 2015 UWMP's contents and the public review and adoption process is provided below, following a discussion of the legislative changes that have been enacted since the 2010 UWMPs were prepared and adopted.

ES.3 LEGISLATIVE CHANGES FROM 2010 UWMP

The legislative changes to the UWMP Act are described in Chapter 1. Some highlighted changes include:

- Demand Management Measures: Address the nature and extent of each water demand management measure implemented over the past five (5) years in narrative form.
- 2015 UWMP Submittal Date to DWR: Changed from December 31, 2015 to July 1, 2016.
- Water Loss: Requires water suppliers to quantify and report on distribution system water loss using the AWWA Water Audit methodology.
- Voluntary Reporting of Passive Savings due to new water codes and requirements.
- Voluntary Reporting of Energy Intensity: Describe the water/energy nexus.
- Defining Water Features: Water Shortage Contingency Plans must distinguish between water features that are artificially supplied with water (including ponds, lakes, waterfalls, and fountains) and swimming pools and spas.

ES.4 PLAN ORGANIZATION

This 2015 UWMP contains the appropriate sections and tables required per California Water Code Division 6, Part 2.6 (Urban Water Management Planning Act), included in Appendix A of

this 2015 UWMP, and have been prepared based on guidance provided by the California DWR in their March 2016 "Final 2015 Urban Water Management Plans, Guidebook for Urban Water Suppliers" (DWR 2015 Guidebook). The required tables are included in the relevant sections and in Appendix B.

DWR's Urban Water Management Plan Checklist, as provided in the DWR 2015 Guidebook, has been completed to demonstrate the Plan's compliance with applicable requirements. A copy of the completed checklist is included in Appendix C.

This 2015 UWMP is organized into the following chapters:

- Chapter 1: Introduction and Overview
- Chapter 2: Plan Preparation
- Chapter 3: System Description
- Chapter 4: System Water Use
- Chapter 5: SB X7-7 Baselines and Targets
- Chapter 6: System Supplies
- Chapter 7: Water Supply Reliability
- Chapter 8: Water Shortage Contingency Planning
- Chapter 9: Demand Management Measures
- Chapter 10: Plan Adoption, Submittal and Implementation

Appendices (listed in Chapter 1) provide relevant supporting documents, including the 2015 UWMP tables and SB X7-7 Verification Form.

ES.5 PLAN REVIEW AND ADOPTION

The UWMP Act requires the water supplier to coordinate the preparation of its Plan with other appropriate agencies, including other water suppliers that share a common source, water management agencies, and relevant public agencies. These agencies, as well as the public, participated in the coordination and preparation of this 2015 UWMP. The coordination and outreach are described in Chapter 2.

A public hearing to discuss the draft 2015 UWMP will be held on June 27, 2016.

Public hearings provide an opportunity for City water users and the general public to become familiar with the Plan and to ask questions about the City's continued plans for providing a reliable, safe, high-quality water supply. The adoption, implementation and economic impact of revised per capita water use targets (described in Chapter 5) were also discussed. Copies of the draft Plan were made available for public inspection at the Ceres Public Works Department, the Ceres Public Library, the Clerk's Office and the City's website.

Water Code § 10621 (b) requires agencies to notify the cities and counties to which they serve water that the Plan is being updated and reviewed. This notification must be sent out at least 60 days in advance of the public hearing. In February 2016, a notice of preparation was sent to the cities and counties, and other stakeholders, to inform them of the UWMP update process and schedule and to solicit input for the Plan update. The notifications to cities and counties, the public hearing notifications, and the public hearing and adoption are discussed in Chapter 10 and provided in Appendix D.

This Plan was adopted by the City Council on June 27, 2016. A copy of the adopted resolution is provided in Appendix J.

Within 30 days of Plan adoption, a copy of the Plan was submitted to DWR, the Ceres Public Library and the cities and counties to which the City provides water.

Within 30 days of submitting the adopted Plan to DWR, copies of this Plan will be made available during normal business hours at the following locations:

- Ceres Public Library, and
- Ceres Public Works Department.

A copy of the adopted Plan will also be available for review and download on the City's website: http://www.ci.ceres.ca.us/213.html

Should this Plan be amended or changed, copies of amendments or changes to the Plan shall be submitted to DWR, the Ceres Public Library, and any city or county within which the City provides water supplies within 30 days after adoption of the amendment(s).

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CHAPTER 1
Introduction and Overview

This chapter provides an introduction and overview of the City of Ceres (City) 2015 Urban Water Management Plan (UWMP) including the importance and extent of the City's water management planning efforts, changes since the preparation of the City's 2010 UWMP, and organization of the City's 2015 UWMP. This 2015 UWMP has been prepared by City staff.

1.1 BACKGROUND AND PURPOSE

The Urban Water Management Planning Act (Act) was originally established by Assembly Bill 797 (AB 797) on September 21, 1983. Passage of this Act was recognition by state legislators that water is a limited resource and a declaration that efficient water use and conservation would be actively pursued throughout the state. The Act requires water suppliers in California providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet per year (AFY) of water to prepare and adopt an Urban Water Management Plan (UWMP) every five years. With the primary objective of directing "urban water suppliers" to develop an UWMP which provides a framework for long-term water supply planning and documents how urban water suppliers are carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future water demands. A copy of the current version of the Act, as incorporated in Sections 10610 through 10656 of the California Water Code (CWC), the Water Conservation Act of 2009 (SBx77), SB 1478 and the Sustainable Groundwater Management Act (SGMA) is provided in Appendix A of this document.

1.2 URBAN WATER MANAGEMENT PLANNING AND THE CALIFORNIA WATER CODE

The purpose of the UWMP is to provide a planning tool for the City for developing and delivering municipal water supplies to the City's water service area. The City has a long history of providing clean and reliable water to its mostly residential, commercial, and industrial customers. Expanding local groundwater sources have historically met the needs for water in the community. To continue to meet the water needs of the community, the City will carefully manage its groundwater supply and begin utilizing treated Tuolumne River water through the Regional Surface Water Supply Project in the next five years. The City's UWMP is a comprehensive guide for planning for a safe and adequate water supply.

1.2.1 APPLICABLE CHANGES TO THE WATER CODE SINCE THE 2010 UWMP

The Urban Water Management Planning Act has been modified over the years in response to the State's water shortages, droughts and other factors. A significant amendment was made in 2009, after the 2007 to 2009 drought, and as a result of the Governor's call for a statewide 20 percent reduction in urban water use by the year 2020. This was the Water Conservation Act of 2009, also known as SB X7-7. This act required agencies to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. There have been several additions and changes to the California Water Code since the City's 2010 UWMP was prepared. These are summarized below:

- AB 2067 (Weber 2014)
  - CWC Section 10631 (f)(1) and (2): Demand Management Measures
    - Requires water suppliers to provide narratives describing their water demand management measures, as provided.
    - Requires retail water suppliers to address the nature and extent of each water demand management measure implemented over the past 5 years and describe the water demand management measures that the supplier plans to implement to achieve its water use targets.
    - See Chapter 9 of this 2015 UWMP for a description of the City's Demand Management Measures.
  - CWC Section 20621 (d): Submittal Date
    - Requires each urban water supplier to submit its 2015 UWMP to the Department of Water Resources by July 1, 2016.
- SB 1420 (Wolk 2014)
  - CWC Section 10644(a)(2): Submittal Format
    - Requires the UWMP, or amendments to the UWMP, to be submitted electronically to the department.
  - CWC Section 10644(a)(2): Standardized Forms
    - Requires the UWMP, or amendments to the UWMP, to include any standardized forms, tables, or displays specified by the department.
  - CWC 10631 (e)(1)(J) and (e)(3)(A) and (B): Water Loss
    - Requires an UWMP to quantify and report on distribution system water loss.
    - See Chapter 4 of this 2015 UWMP for a description of the City's distribution system water losses.
  - CWC 10631 (e)(4): Voluntary Reporting of Passive Savings
    - Provides for water use projections to display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans, when that information is available and applicable to an urban water supplier.
    - See Chapter 4 of this 2015 UWMP for a description of the City's passive water savings.
- SB 1036 (Pavley 2014)
  - CWC 10631.2 (a) and (b): Voluntary Reporting of Energy Intensity
    - Provides for an urban water supplier to include certain energy-related information, including, but not limited to, an estimate of the amount of the energy used to extract or divert water supplies.
    - The City has opted to not report on energy intensity in this 2015 UWMP.
  - CWC 10632: Defining Water Features
    - Commencing with the UWMP update due July 1, 2016, for purposes of developing the water shortage contingency analysis, requires urban water suppliers to analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.

1.3 URBAN WATER MANAGEMENT PLANS IN RELATION TO OTHER PLANNING EFFORTS

To aid in meeting water legislation, the City has partnered at the local and state level to diversify the City's water supply portfolio to significantly increase reliability benefits while reducing the City's reliance on groundwater. Locally, the City has partnered with neighboring City of Turlock to form the Stanislaus Regional Water Authority (SRWA) to develop a future water supply plan from Turlock Irrigation District. This alliance is noteworthy because the amount of groundwater in storage in each basin is dependent on the precipitation, recharge and the total extraction of water from all the wells within the system. The groundwater management plan will be designed for the political, institutional, legal and technical specifics of the basin, which can help adjacent agencies, maintain the quality and quantity of the groundwater supply. This alliance will help the City to plan additional programs that will lead to more efficient management.

In 2014 Governor Brown signed the Sustainable Groundwater Management Act (SGMA) which went into effect January 1st, 2015. A Memorandum of Understanding (MOU) was adopted in September of 2015, by the City of Ceres stating that the City will coordinate groundwater management activities with the Turlock Groundwater Basin Association (TGBA) for the purpose of developing a basin-wide groundwater management plan to meet compliance at the state level (Appendix F). As required in the SGMA, the City of Ceres and all basins designated as high or medium priority and subject to critical conditions of overdraft shall be managed within a Groundwater Sustainable Agency (GSA) established by June 30, 2017. An approved Groundwater Sustainable Plan (GSP) must be adopted by each agency by December 2020.

The City continues to be committed to water conservation and our residents; making every effort to efficiently utilize our produced water supply. With the continuation of the drought that our city and state faces we continue to ask our residents to conserve water in their daily activities. As a city we have made great progress in reducing our gallons per capita, keeping us on track to meet the water reduction goals set in our 2010 Urban Water Management Plan. For instance, in 2015 the City surpassed its reduction goal of 219 gallons per capita per day (GPCD) with a total of 121 GPCD; which is a remarkable 45% difference. Verifying that water conservation is a mindset that can be embrace during and after this drought has ended. The 2020 reduction goal was set at 194 GPCD in the 2010 UWMP.

1.4 UWMP ORGANIZATION

This 2015 UWMP contains the appropriate sections and tables required per CWC Division 6, Part 2.6 (Urban Water Management Planning Act), included in Appendix A of this 2015 UWMP, and has been prepared based on guidance provided by the California Department of Water Resources (DWR) in their January 2016 "2015 Urban Water Management Plans Guidebook for Urban Water Suppliers" (DWR 2015 Guidebook). The required tables are included in the relevant sections and in Appendix B.

DWR's UWMP Checklist, as provided in the DWR 2015 Guidebook, has been completed by City staff to demonstrate the UWMP's compliance with applicable requirements. A copy of the completed checklist is included in Appendix C.

This 2015 UWMP is organized into the following chapters:

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- Chapter 8: Water Shortage Contingency Planning
- Chapter 9: Demand Management Measures
- Chapter 10: UWMP Adoption, Submittal and Implementation

This 2015 UWMP also contains the following appendices of supplemental information and data related to the City's 2015 UWMP:

- Appendix A: Legislative Requirements
- Appendix B: DWR UWMP Tables
- Appendix C: DWR UWMP Checklist
- Appendix D: Agency and Public Notices
- Appendix E: SB X7-7 Tables
- Appendix F: Water Conservation & Rationing Plan
- Appendix G: Water Emergency/Disaster and Response Plan
- Appendix H: Water Rates
- Appendix I: Water Audit
- Appendix J: UWMP Adoption Resolution

1.5 CONTACT

The City (Water Supplier) is a Municipality, and is not a Bureau of Reclamation Contractor or State Water Project Contractor. The name of the person to contact regarding this Urban Water Management Plan is:

Jeremy Damas
City of Ceres Public Works Department
Public Works Director
2220 Hackett Road
Ceres, CA 95307
Tel: (209) 538-5717
Fax: (209) 538-5605
Email: jeremy.damas@ci.ceres.ca.us

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Chapter 2. UWMP Preparation

This chapter describes the preparation of the City's 2015 UWMP, including the basis for the preparation of the UWMP, individual or regional planning, fiscal or calendar year reporting, units of measure, and UWMP coordination and outreach.

2.1 BASIS FOR PREPARING AN UWMP

The Urban Water Management Planning Act requires every "urban water supplier" to prepare and adopt an UWMP, to periodically review its UWMP at least once every five years and make any amendments or changes which are indicated by the review. An "urban water supplier" is defined as 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 (AF) of water annually.

2.1.1 PUBLIC WATER SYSTEMS

As shown in Table 2-1 (DWR Table 2-1), in 2015, the City provided water supplies to 11,646 water connections. The City supplied 6,458.4 AF (2,104.5 million gallons (MG)) of potable water. Therefore, the City is required to prepare an UWMP. The City's last UWMP, the 2010 UWMP, was adopted by the City Council in June 2011.

Table 2-1. Retail Only: Public Water Systems (DWR Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA5010028	City of Ceres	11,646	2,105
	TOTAL	11,646	2,105
NOTES: Volumes are in MG.			

2.2 REGIONAL PLANNING

The City is a member and participant in several regional groups that do water planning in the region. These groups include the Stanislaus Regional Water Authority and the Turlock Groundwater Basin Association (TGBA). Although, the City is closely involved with these regional organizations, the City is not engaging in a cooperative regional Urban Water Management Plan with any of these entities because the City is the sole water supplier and water management agency for the area.

2.3 INDIVIUAL OR REGIONAL PLANNING AND COMPLIANCE

This 2015 UWMP has been prepared on an Individual Reporting basis, covering only the City's service area (see Table 2-2). As described in Section 2.5, the City has notified and coordinated with appropriate regional agencies and constituents, including the Stanislaus Regional Water Authority, the Turlock Groundwater Basin Association (TGBA), as well as several local agencies.

Table 2-2. Plan Identification (DWR Table 2-2)

Table 2-2: Plan Identification			
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	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

2.4 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

The City is a water retailer and the UWMP has been prepared on a calendar year basis. The City's 2015 UWMP includes planning data for the complete year of 2015. The City's reporting of water volumes in this 2015 UWMP is reported in million gallons per year (MGY).

Table 2-3 (DWR Table 2-3) summarizes the City's reporting methods for this 2015 UWMP.

Table 2-3. Agency Identification (DWR Table 2-3)

Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fisc r Calendar Year (select one)	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
Units of Measure Used in UWMP (select from Drop down)	
Unit	MG

2.5 COORDINATION AND OUTREACH

This section includes a discussion of the City's inter-agency coordination and coordination with the general public. The UWMP Act requires the City to coordinate the preparation of its Plan with other appropriate agencies and all departments within the City, including other water suppliers that share a common source, water management agencies, and relevant public agencies. These agencies, as well as the public, participated in the coordination and preparation of this 2015 UWMP, and are summarized below.

2.5.1 AGENCY COORDINATION

The City is a member agency of the Stanislaus Regional Water Authority and the Turlock Groundwater Basin Association (TGBA). These and other agencies, as well as the public, participated in the coordination and preparation of this 2015 UWMP. The water supplier information exchange is summarized in Table 2-4 (DWR Table 2-4).

Table 2-4. Retail: Water Supplier Information Exchange (DWR Table 2-4)

The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Turlock Irrigation District

In February 2016, at the beginning of the UWMP update process, a notice of preparation was sent to stakeholders to inform them of the UWMP update process and schedule and solicit input for the update.

Following completion of the Draft UWMP, a notification of public review was placed in the both the Modesto Bee and the Ceres Courier about the 2015 UWMP update process and copies of the Draft UWMP were made available at the City's Public Works Department and the City's Clerk's office during normal business hours and at the Ceres Public Library, with an electronic version placed on the City's website. Copies of the Draft UWMP were also sent directly to key stakeholder agencies (see Table 2-4). During the public review period, local cities and communities, as well as the general public, were encouraged to comment on the draft document.

A public hearing to discuss the Draft UWMP was held on June 27, 2016, in conjunction with the District's Board of Directors meeting. Noticing for the public hearing was conducted pursuant to Section 6066 of the Government Code. Also, per CWC Section 10621, notice regarding the public hearing was sent to the City and Stanislaus County 60 days prior to the public hearing date. Copies of the public hearing notices and notices to city and county entities served by the City, as well as other agencies, are included in Appendix D.

2.5.2 COORDINATION WITH OTHER AGENCIES AND THE COMMUNITY

The City has actively encouraged community participation in water management activities and specific water related projects. The City's public participation program includes both active and passive means of obtaining input from the community, such as mailings, public meetings, and web based communication. The City's website describes construction projects and posts announcements of planned rate increases prior to adoption.

As part of development of this 2015 UWMP update, the City allowed a public review period following noticing and prior to adoption to allow ample time for public comments to be developed and received. Public noticing, pursuant to Section 6066 of the Government Code, was conducted prior to commencement of the public comment period. Public hearing notices are included in Appendix D of this document. During the public comment period, a hard copy of the Draft UWMP update was made available at the City's Public Works Department and the City's Clerk's office during normal business hours and at the Ceres Public Library, with an electronic version placed on the City's website.

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Chapter 3. System Description

This chapter provides a description of the City's water system and service area. This includes a description of the water system facilities, climate, population, and housing within the City's service area.

3.1 GENERAL DESCRIPTION

The City, incorporated in 1918, is located in the Central San Joaquin Valley along State Highway 99. Only 80 miles south of Sacramento and 95 miles east of San Francisco, the City is nestled in the heart of Stanislaus County. The City is in one of the Central Valley's richest and most diverse agricultural areas and is home of the new $14 million County Agriculture Center. Even the name "Ceres" originates from the Roman goddess of agriculture.

3.2 SERVICE AREA

The City and water service area encompass an area of approximately 5,989 acres, or about 9.4 square miles. While the City's existing service area is generally contiguous with the City limit, there is a section in the northwest portion of the City that receives water service from the City of Modesto as well as a section that is outside of the City limits that receives water from the City. The City provides water to approximately 11,646 residential, commercial, industrial and institutional/government service connections. Municipal water supply for the City is currently based solely on groundwater supplies (see more discussion in Chapter 6).

The City water system serves its population of about 46,989 through 12 active wells. The distribution system consists of approximately 154 miles of water lines, with plans for expansion for the future surface water distribution (see more discussion in Chapter 6). Figure 3-1 provides a location map of the service area.

3.3 SERVICE AREA CLIMATE

Water use within the City's service area is dependent on various climate factors such as temperature, precipitation, and evapotranspiration (ET). Climate data, including temperature and precipitation estimates, were obtained from the Western Regional Climate Center for the City service area. The period of record is March 1, 1906 to January 1, 2015.

ET is a term used to describe water lost through evaporation from the soil and surface water bodies, combined with plant transpiration. Local data was obtained from California Irrigation Management Information System (CIMIC) Station #71, located west of Modesto.

The City of Ceres has a Mediterranean climate. Summers are hot and dry while winters are cold and wet, with an annual average precipitation of approximately 12.21 inches. The local annual average maximum daily temperature is 74.6 degrees (F) and the annual average min daily temperature is 48.4 degrees (F). The region is subject to wide variations in annual precipitation. The climatic data for the City of Ceres area is shown in Table 3-1.

Table 3-1. Climate Data Summary

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average ETo, inches[(a)]	1.13	2.71	3.67	6.07	6.71	7.99	7.97	7.29	4.98	3.64	1.99	1.36	55.51
Average Max Temperature, °F[(b)]	53.8	60.9	66.9	73.3	81.2	88.3	94.3	92.3	87.7	77.9	64.6	54.4	74.6
Average Min Temperature, °F[(b)]	37.6	40.8	43.5	46.8	51.8	56.6	60	58.8	56	49.6	41.7	37.7	48.4
Average Rainfall, inches[(b)]	2.44	2.07	1.93	1.03	0.46	0.13	0.02	0.04	0.17	0.63	1.24	2.05	12.21
(a) Source: CIMIS Website: wwwcimis.water.ca.gov, Station 71 Modesto, California (April 2015 to March 2016), Monthly Average ETo Report, Printed April 2016.													
(b) Source: Western Regional Climate Center (WRCC) website: www.wrcc.dri.edu, Station 045738 Modesto, California. Period of record: 3/1/1906 to 1/20/2015.													

These climate characteristics highly influence the City's water use. As described in Chapter 4, the City's water use in the summer months is significantly higher than that in the winter, reflecting increased water use for irrigation purposes during the hot, dry summers.

3.4 Service Area Population and Demographics

The City's current (2015) service area population of 46,989 has been estimated by the Department of Finance (DOF). Historical and projected population were developed using data collected from the City.

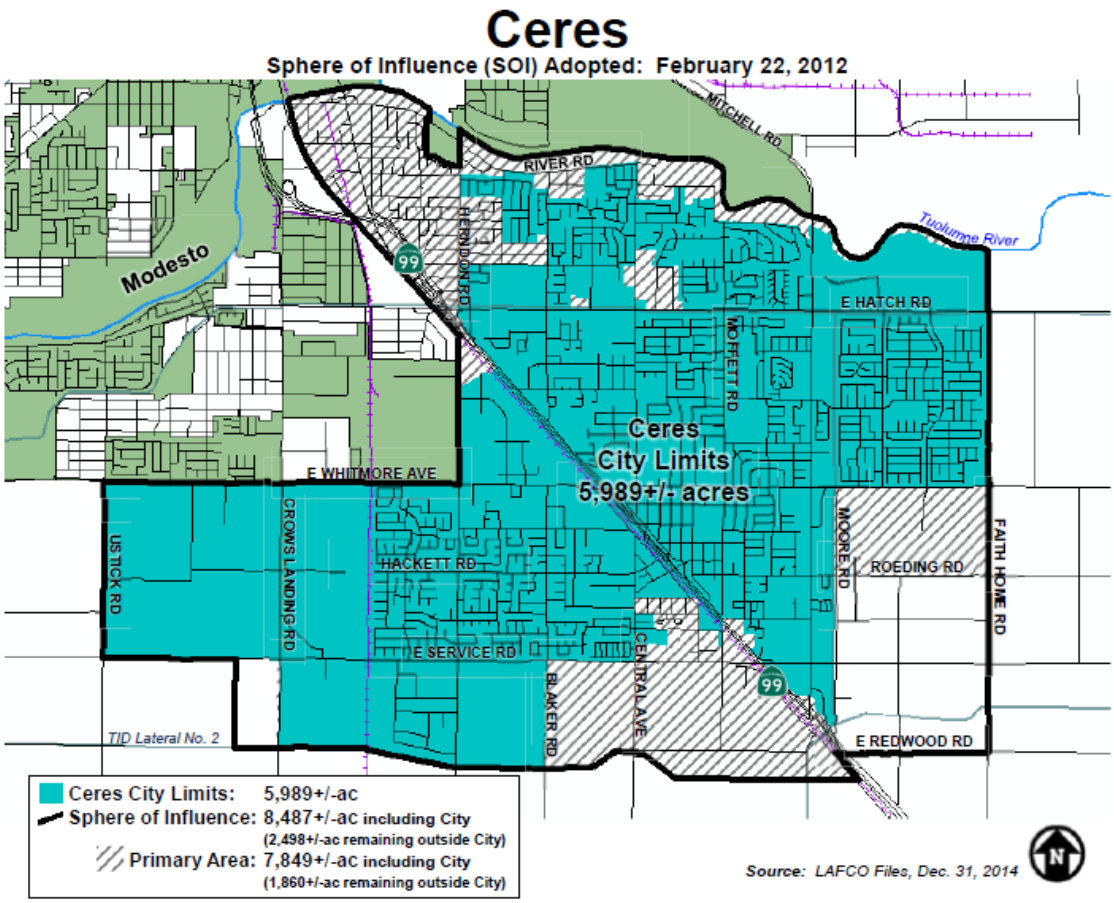
The City's population has grown at an average annual rate of 3.4 percent from 2010 through 2015 according to population estimates from DOF. Household size within the City is estimated at about 3.65 persons per household with approximately 13,764 total households in 2015.

Growth and development within the City's service area are subject to City and County growth management policies. Projections of future population within the District's service area have been made by taking the estimated buildout projections made in the 2010 Water Master Plan and increasing by 4.8% for each five year's until buildout. These results are summarized in Table 3-2 (DWR Table 3-1).

Table 3-2. Retail: Population – Current and Projected (DWR Table 3-1)

Population Served	2015(a)	2020(b)	2025(b)	2030(b)	2035(b)
	46,989	59,266	71,543	83,820	96,100
NOTES: (a) Source: Department of Finance Demographic Research unit report E-5. (b) Future population growth assumed from the City's 2010 Water Master Plan at year 2035.					

Figure 3-1. Location Map



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Chapter 4. System Water Use

CHAPTER 4
System Water Use

As described in Chapter 3, the City's water service area is mostly residential, metered accounts. This chapter addresses the City's past, current, and projected water use. Water demand projections are based on the selected SBX 7-7 water use targets combined with the projected population according to the City's 2010 Water Master Plan. Accurately tracking and reporting current water demands allows the City to properly analyze the use of their resources and conduct good resource planning.

4.1 RECYCLED VERSUS POTABLE AND RAW WATER DEMAND

The City serves its demand for water with different levels of treatment depending on the end use. Potable water is the sole source of water supply for the City. Raw water, from non-potable, shallow, park wells are utilized for some irrigation uses because they do not require the same standards as drinking water. Additional discussion of recycled water can be found in Chapter 6.

4.2 WATER USES BY SECTOR

Water production is the combined quantity of water produced by the City's groundwater wells, while water consumption is the quantity of water actually consumed or used. The difference between production and consumption is unaccounted-for water (UAFW).

This section describes the City's past, current and projected water use by sector through the year 2035 in five-year increments. Demand projections provide the basis for sizing and staging future water facilities to ensure adequate supply. This section identifies the usage among water use sectors including single-family residential, multifamily residential, commercial, industrial, institutional/governmental, and landscape irrigation. These classifications were used to analyze current consumption patterns among various types of customers. These classifications are defined by the DWR 2015 Guidebook and City as follows:

- Single-family residential – A single-family dwelling unit – A lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.
- Multi-family – Multiple dwelling units contained within one building or several buildings within one complex.
- Commercial – A water user that provides or distributes a product or service.
- Industrial – A water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.
- Institutional/Governmental – A water user dedicated to public service.
- Landscape – Water connections supplying water solely for landscape irrigation.

Actual water use by the City's customers, by water use sector, in 2005 and 2010 is summarized in Tables 4-1 and 4-2, respectively. Due to the metering program not being completed until 2011, water use is based on groundwater well production records.

Table 4-1. City of Ceres Water Deliveries—Actual (2005)

Water Use Sectors	2005				
	Metered		Non Metered		
	# of Services	Deliveries, AFY	# of Services	Deliveries, AFY	Total Deliveries, AFY
Single Family	8	4	9,343	6,140	6,144
Multi-Family	150	733	216	1,432	2,165
Commercial	274	580	92	240	820
Industrial	94	120	9	10	130
Institutional/Governmental	0	0	0	0	0
Landscape	128	470	2	10	480
Agriculture	0	0	0	0	0
Other	0	0	0	0	0
Total	654	1,907	9,662	7,832	9,739

Table 4-2. City of Ceres Water Deliveries—Actual (2010)

Water Use Sectors	2010				
	Metered		Non Metered		
	# of Services	Deliveries, AFY	# of Services	Deliveries, AFY	Total Deliveries, AFY
Single Family	10,208	4,225	0	0	4,225
Multi-Family	410	1,408	0	0	1,408
Commercial	317	704	0	0	704
Industrial	107	70	0	0	70
Institutional/Governmental	62	282	0	0	282
Landscape	159	352	0	0	352
Agriculture	0	0	0	0	0
Other	0	0	0	0	0
Total	11,263	7,041	0	0	7,041

Actual water use by the City's customers, by water use sector, in 2015 is summarized in Table 4-3 (DWR Table 4-1).

Table 4-3. Retail: Demands for Potable and Raw Water – Actual (DWR Table 4-1)

Use Type	2015 Actual		
	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume
Single Family		Drinking Water	1,317
Multi-Family		Drinking Water	231
Commercial		Drinking Water	653
Industrial		Drinking Water	20
Landscape		Drinking Water	131
Institutional/Governmental		Drinking Water	98
Losses		Drinking Water	161
		TOTAL	2,611
NOTES: Volumes are in MG.			

The projected water use by the City's customers is based on the best available information at this time. The City was able to track actual water use by customers and sector type through the metering program, which was fully implemented in 2011. Per capita demand declined after the meters were installed throughout the City. Per capita demand also declined drastically in 2014 and 2015, due to the drought and associated conservation efforts. The City has therefore assumed that the year 2010 represents a reasonable approximation as to what future per capita water use will be if and when the current drought ends. Per capita water use in 2010 was approximately 183 gallons per capita per day (GPCD).

The City projected annual water demand, assuming an annual water production growth of 0.96% or 4.8% every five years is consistent with the population growth rate projected in the 2010 Water Master Plan. Utilizing the 0.96% projection growth into year 2035 from the actual water use in 2010, the projected water use by water use sector was approximated. These results are summarized in Table 4-4 (DWR Table 4-2).

Table 4-4. Retail: Demands for Potable and Raw Water – Projected (DWR Table 4-2)

Use Type *(Add additional rows as needed)*	Additional Description *(as needed)*	Projected Water Use *Report To the Extent that Records are Available*			
		2020	2025	2030	2035
Single Family		1,777	2,237	2,696	3,156
Multi-Family		301	347	393	512
Commercial		852	982	1,111	1,447
Industrial		31	41	50	64
Landscape		171	198	224	291
Institutional/Governmental		114	120	126	162
Losses		258	316	373	373
TOTAL		3,505	4,241	4,973	6,006
NOTES: Volumes are in MG. Projections are based on 2010 Water Master Plan.					

Total water demands, including those from recycled water demands are summarized in Table 4-5 (DWR Table 4-3).

Table 4-5. Retail: Total Water Demands (DWR Table 4-3)

	2015	2020	2025	2030	2035
Potable and Raw Water *From Tables 4-1 and 4-2*	2,611	3,505	4,241	4,973	6,006
Recycled Water Demand* *From Table 6-4*	0	0	0	0	0
TOTAL WATER DEMAND	2,611	3,505	4,241	4,973	6,006
**Recycled water demand fields will be blank until Table 6-4 is complete.*					
NOTES: Volumes are in MG.					

4.3 DISTRIBUTION SYSTEM WATER LOSSES

Water losses occur due to distribution system leaks and other unmetered water uses (such as firefighting, main flushing, etc.). Actual water losses within the City's water system, from the most recent year of 2015, are summarized in Table 4-6 (DWR Table 4-4).

Table 4-6. Retail: 12 Month Water Loss Audit Reporting (DWR Table 4-4)

Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2015	113.887
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: Volumes are in MG.	

4.4 ESTIMATING FUTURE WATER SAVINGS

CWC Section 10631(e)(4) provides the option for urban water suppliers to reflect its own and its customer's efficiency efforts as part of its future demand projection.

The City anticipates future water savings through its demand management measures and passive forms of water savings such as through the updates to the Water Conservation section of the Ceres Municipal Code, compliance with the state's Model Water Efficient Landscape Ordinance (MWELO), enforcement of the 2013 California Building Code and 2013 California Plumbing Code.

The January 2016 updates to the Ceres Municipal Code are discussed at length in Chapter 8.

MWELO was enacted pursuant to California Code of Regulations Title 23, Waters, Division 2, Department of Water Resources, Chapter 2.7 and is intended to reduce water consumption of landscapes while also enhancing aesthetic appearances and protecting the public by minimizing visual pollution and soil erosion. Examples of features that can reduce the demand for water include: low water using plants, nonliving ground cover, permeable paving, and updated water conserving irrigation techniques.

Effective January 1, 2014, as part of the California Building Code, the City requires low-flow plumbing fixtures for future home and business remodels, to further increase future water savings.

Future water savings were incorporated into the water demand projections by estimating water growth projections from the water use in the year 2010 because the water use this year reflects conservation observed as a result of a robust water conservation program. Additional conservation was not assumed for planning purposes because it is expected that water use patterns are likely to return back to the 2010 levels once the current drought is over. Otherwise, estimated future water savings was not taken into account because of the challenge in quantifying the anticipated savings from these measures and to be conservative for long-term water resources planning. However, if MWELO and low-flow fixture requirements and demand management measures prove to be effective at achieving a long-term water use reduction, then investments in facilities and programs to increase the City's water supply can be delayed.

4.5 WATER USE FOR LOWER INCOME HOUSEHOLDS

Senate Bill 1087 (SB 1087) approved on October 7, 2005 added certain provisions to the Government Code and amended a portion of the UWMP Act. As it relates to the UWMP Act, SB 1087 requires the water use projections of an UWMP to include the projected demands for single-family and multi-family residential housing needed for lower income households as identified in the housing element of any city or county in the service area of the supplier (CWC § 10631(a).) A low income household is any household that has an income below 80 percent of the area median income, adjusted for family size.

Based on information provided by internal staff, approximately 3 percent of the City's single family residential units are affordable housing units and approximately 21 percent of the multifamily residential units are affordable housing units. For purposes of this 2015 UWMP, it is assumed that 3 percent of future single family water use and 21 percent of future multifamily water use will be from affordable housing units.

Table 4-7 shows projected demands for low income housing based on estimated percentages of Single Family Residential and Multi-Family Residential households that are low income.

Table 4-7. City of Ceres Low Income Projected Water Demands

Low Income Water Demands	2015	2020	2025	2030	2035
Single Family Residential[a]	46	60	74	89	103
Multi-Family Residential[b]	104	110	119	127	136
Total	150	170	193	216	239
Notes: Volumes are in MG					
[a] Based on 3 percent of the projected future single family residential water demand.					
[b] Based on 21 percent of the projected future multi-family residential water demand.					

Table 4-8 (DWR Table 4-5) indicates that both future water savings estimates and lower income residential demands have been included in the water demand projections.

Table 4-8. Retail Only: Inclusion in Water Use Projections (DWR Table 4-5)

Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook)	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc.... utilized in demand projections are found.	Section 4.4
Are Lower Income Residential Demands Included In Projections?	Yes

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Chapter 5. SB X7-7 Baselines and Targets

CHAPTER 5
SB X7-7 Baselines and Targets

In November 2009, Senate Bill X7-7 (SB X7-7), The Water Conservation Act of 2009, was signed into law by Governor Arnold Schwarzenegger as part of a comprehensive water legislation package. The Water Conservation Act addresses both urban and agricultural water conservation. The legislation sets a goal of achieving a 20 percent statewide reduction in urban per capita water use by the year 2020 (*i.e.*, "20 by 2020"), and directs urban retail water suppliers to establish an "interim" per capita water use target to be met by 2015 and a "final" per capita water use target to be met by 2020.

The City's compliance with SB X7-7 was first addressed in the City's 2010 UWMP. The City's baseline per capita water use was determined, and urban water use targets for 2015 and 2020 were established and adopted. SB X7-7 included a provision, CWC 10608.20 (g), that an urban water supplier may update its 2020 urban water use target in its 2015 UWMP, and may use a different target method than was used in 2010. Also, the SB X7-7 methodologies developed by DWR in 2011 noted that water suppliers may revise population estimates for baseline years when the 2010 U.S. Census information became available - as described below, the 2010 Census data was not finalized until 2012.

The DWR 2015 Guidebook indicates that there were significant discrepancies between the California Department of Finance (CDOF) estimated 2010 population (based on 2000 U.S. Census data) and the actual 2010 population (based on 2010 U.S. Census data). Therefore, if a water supplier did not use 2010 U.S. Census data for their baseline population calculations in the 2010 UWMP, DWR has determined that these water suppliers must recalculate their baseline population for the 2015 UWMP using 2000 and 2010 U.S. Census data, and baseline, 2015, and 2020 urban water use targets must be modified accordingly.

This chapter provides a review and update of the City's baseline per capita water use, 2015 interim per capita water use target, and 2020 final per capita water use target in accordance with the requirements described in the DWR 2015 Guidebook and based on the 2010 U.S. Census population data. The City calculated baselines and targets on an individual reporting basis in accordance with SBx7-7 legislation requirements and *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (DWR, 2016). The City has achieved compliance with its 2015 interim target, as discussed below, and is well-positioned to achieve its 2020 final target.

The SB X7-7 Verification Forms are included in Appendix E.

5.1 UPDATING CALCULATIONS FROM 2010 UWMP

Per the provision in SB X7-7, CWC 10608.20 (g), the City has updated its 2020 urban water use target in this 2015 UWMP using method 1 in the SB X7-7 Table 7A. Also as required by the DWR 2015 Guidebook, the City will revise its population estimates for baseline years with data from both the 2010 U.S. Census now that it is available and the Department of Finance. Population data from the 2010 U.S. Census was not available by the time the 2010 UWMP was developed. This chapter includes updated population, baselines, and targets for this 2015 UWMP to reflect 2010 U.S. Census data. The following sections describe these updates.

5.2 BASELINE PERIODS

SB X7-7 requires each urban water retailer to determine their baseline daily per capita water use, measured in gallons per capita per day (Baseline GPCD), over a 10-year or 15-year baseline period. The 10-year baseline period is defined as a continuous 10-year period ending no earlier than December 31, 2004 and no later than December 31, 2010. SB X7-7 also defines that for those urban water retailers that met at least 10 percent of their 2008 water demand using recycled water, the urban water retailer can extend the Baseline GPCD calculation for a maximum of a continuous 15-year baseline period, ending no earlier than December 31, 2004 and no later than December 31, 2010.

In 2008, the City did not utilize recycled water. Therefore, the City does not qualify for the 15-year baseline period.

SB X7-7 also requires each urban water retailer to determine a 5-year baseline per capita water demand, which DWR calls the Target Confirmation, calculated over a continuous 5-year period ending no earlier than December 31, 2007 and no later than December 31, 2010.

Based on these requirements, the City has selected the following baseline periods:

- 10-year Baseline Period: 2001-2010
- 5-year Baseline Period: 2005-2009

These baseline periods are listed in SB X7-7 Table 1 in Appendix E. The 10-year and 5-year periods have been updated to take into account populations numbers from the Department of Finance. Table 5-1 (DWR Table 5-1) also references the appropriate SB X7-7 tables from which the baseline and target summary data can be found.

Table 5-1. Baselines and Targets Summary (DWR Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	*2001*	*2010*	*224*	*202*	*180*
5 Year	*2005*	*2009*	*219*		
*All values are in Gallons per Capita per Day (GPCD)					

5.3 SERVICE AREA POPULATION

DWR 2015 Guidebook, Required Use of 2010 U.S. Census Data page 5-5 – if an agency did not use 2010 Census data for their baseline population calculations in the 2010 UWMP…DWR has determined that these agencies must recalculate their baseline populations for the 2015 UWMPs using 2000 and 2010 Census

data. This may affect the baseline and target GPCD values calculated in the 2010 UWMP, which must be modified accordingly in the 2015 UWMP.

This section includes a discussion of the City's service area population including 2000 and 2010 U.S. Census data. Population reported in the City's 2010 UWMP did not include 2010 U.S. Census data because the full Census data set was not available until 2012.

The CDOF uses U.S. Census data, combined with changes to the housing stock, estimated occupancy of housing units, and the number of persons per household to estimate annual population within jurisdictional boundaries. CDOF population estimates, corrected to account for 2000 and 2010 Census data were used to estimate service area population. The service area boundaries correspond by 95 percent or more with the boundaries of the City and, therefore, the City population is allowed to use CDOF data for the City for the service area population according to the 2015 DWR Guidebook.

5.4 GROSS WATER USE

Annual gross water use is the total water, whether treated or untreated, that enters the City's distribution system over a 12-month period (calendar year). This section addresses the City's annual gross water use for each year in the baseline periods, as well as 2015, in accordance with Methodology 1: Gross Water of DWR's *Methodologies* document.

Annual gross water use for the baseline periods and 2015 are summarized in SB X7-7 Table 4 of Appendix E. Although gross water use should include water entering the City's distribution system that is treated and untreated, the City did not start keeping records of non-potable park irrigation wells until 2015. Therefore, the 2015 volume number does not include the non-potable park irrigation water that was supplied in 2015 so that the comparison between 2015 and the 10 Year and 5 Year Baselines were most accurate.

5.5 BASELINE DAILY PER CAPITA WATER USE

As indicated above, daily per capita water use is reported in gallons per capita per day (GPCD). Annual gross water use is divided by annual service area population to calculate the annual per capita water use for each year of the baseline periods. As discussed above, the City is using updated population data in this 2015 UWMP. The City's calculated baseline daily per capita use is as follows:

- 10-year Base Daily Per Capita Water Use
- 224 GPCD (for the period from 2001 to 2010)
- This value is 19 GPCD less than the value calculated in the 2010 UWMP (243 GPCD)

- 5-year Base Daily Per Capita Water Use
- 219 GPCD (for the period from 2005 to 2009)
- This value is the same as the value calculated in the 2010 UWMP (219 GPCD)

These 10-year and 5-year baseline daily per capita values, along with the 2015 GPCD, are shown in SB X7-7 Table 5 and summarized in SB X7-7 Table 6 in Appendix E.

5.6 2015 AND 2020 TARGETS

SB X7-7 requires a state-wide average 20 percent reduction of urban per capita water use by the year 2020. Therefore, the City must set an interim (2015) water use target and a final (2020) water use target using one of four methods defined by SB X7-7 and DWR. Three of these methods are defined in CWC Section 10608.20(a)(1), and the fourth method was later developed by DWR. The 2020 water use target can be calculated using one of the following four methods:

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

Analysis of Methods 1 and 3 were completed. The calculated 2020 target using Method 1 is 180 GPCD. Methods 2 and 4 require specific data which were not available, so those two methods were not considered. Target Method 1 results in the highest allowable SB X7-7 final (2020) target (180 GPCD by 2020), and is therefore the most favorable to the City.

5.6.1 Year Baseline – 2020 Target Confirmation

Urban water suppliers must verify that their 2020 final water use target is at least a 5 percent reduction from the 5-year baseline GPCD. As shown in SB X7-7 Table 7-F in Appendix E, the City's maximum 2020 target is 208 GPCD (95 percent of the City's 5-year base daily per capita water use of 219 GPCD). The City's Method 1 2020 target of 180 GPCD complies with the minimum reduction.

5.6.2 2015 Interim Urban Water Use Target

The 2015 interim targets for each of the target methods are calculated based on the midpoint of the City's 10-year Base Daily Per Capita Water Use and the confirmed 2020 Target. The midpoint between the City's 10-Year Base Daily Per Capita Water Use (224 GPCD) and the final 2020 target (180 GPCD) is 202 GPCD.

5.6.3 Baselines and Targets Summary

The City's interim and final targets are summarized in Table 5-1 (DWR Table 5-1).

Target Method 1, selected for this 2015 UWMP, was also used in the 2010 UWMP. The confirmed final 2020 target of 180 GPCD is close to the final 2020 target included in the 2010 UWMP (194 GPCD). Therefore, the confirmed interim 2015 target of 202 GPCD is also similar to the interim 2015 target reported in the 2010 UWMP (219 GPCD). The target method and resulting targets may not be changed in any amendments to the 2015 UWMP or in the 2020 UWMP.

5.7 2015 COMPLIANCE DAILY PER CAPITA WATER USE (GPCD)

The City has calculated its actual 2015 water use for the 2015 calendar year in accordance with Methodology 3 of DWR's *Methodologies* document. As shown in Table 5-2 (DWR Table 5-2), urban per capita water use in 2015 was 123 GPCD, which is below the 2015 interim water use target of 202 GPCD. Therefore, the City has met its interim 2015 water use target. The complete set of SB X7-7 verification tables used to document this compliance is included in Appendix E.

Table 5-2. 2015 Compliance (DWR Table 5-2)

Actual 2015 GPCD*	2015 Interim Target GPCD*	Optional Adjustments to 2015 GPCD Enter "0" if no adjustment is made *From Methodology 8*					2015 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2015 GPCD*		
123	202	0	0	0	0	123	123	Yes
**All values are in Gallons per Capita per Day (GPCD)*								
NOTES: Volumes are in MG								

As detailed in DWR's *Methodologies* document, there are allowable adjustments that can be made to an agency's gross water use in 2015 for unusual weather, land use changes, or extraordinary institutional water use. The City has elected not to make the adjustments allowed by CWC section 10608.24 because these exceptions are not needed to demonstrate compliance with SB X7-7.

5.8 BASELINE PERIODS

The City has chosen to comply with the requirements of SB X7-7 on an individual basis and is, therefore, not a participant in a regional alliance for SB X7-7 compliance.

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Chapter 6. System Supplies

Chapter 6
System Supplies

This chapter describes the water supplies currently available to the City, as well as future anticipated water supplies. The City currently only utilizes groundwater. Projected future supplies include surface water from the Tuolumne River.

6.1 PURCHASED OR IMPORTED WATER

The City does not currently purchase or import water from any other water supply or entity. However, the City, as a member of the Stanislaus Regional Water Authority (SRWA), has entered into a water sales agreement for delivery of 1,825 MG per year (5 million gallons per day (MGD)) of Turlock Irrigation District (TID) surface water. TID has indicated that the volume of water requested by Ceres is available and this volume has been used for planning and environmental review purposes. For the purposes of this document, it is assumed that the SRWA Regional Surface Water Supply Project (RSWSP) will be operational in 2020.

6.2 GROUNDWATER

Through 2015, groundwater supplies were used to meet all water needs in the management area. The local groundwater source is the Turlock Sub-basin, which is a sub-unit of the San Joaquin Valley Groundwater Basin. The City currently possesses 29 wells. The number of wells considered active, inactive/abandoned, or non-potable is as follows:

- 12 active
- 2 drilled (no equipment yet)
- 4 inactive/abandoned
- 11 non-potable (irrigation only)

Since the 2010 UWMP, two wells have been removed from active status due to water quality concerns. In addition to evaluating opportunities to reduce contamination in these wells, diversification of supplies away from groundwater (surface water from TID - as described above) will help mitigate any future groundwater quality degradation. Quality constraints and their potential impacts on water supply reliability are discussed further in Chapter 7.

6.2.1 BASIN DESCRIPTION

The Turlock Sub-basin is discussed in detail in the 2008 Turlock Groundwater Basin Groundwater Management Plan (GMP), produced by the Turlock Groundwater Basin Association (TGBA), and summarized as follows. The Turlock Sub-basin lies on the eastern side of California's San Joaquin Valley, and encompasses portions of both Stanislaus and Merced counties. The groundwater system is bound by the Tuolumne River on the north, the Merced River on the south, and the San Joaquin River on the west. The eastern boundary of the system is the western extent of the outcrop of crystalline basement rock in the foothills of the Sierra Nevada. Land uses in the Turlock Sub-basin are diverse and include agriculture, urban, and commercial or industrial uses distributed in a mosaic throughout the region.

The Turlock Sub-basin underlies an area of approximately 347,000 acres, with irrigated crops (245,000 acres), native vegetation (69,000 acres), and urban development (20,000 acres) as the

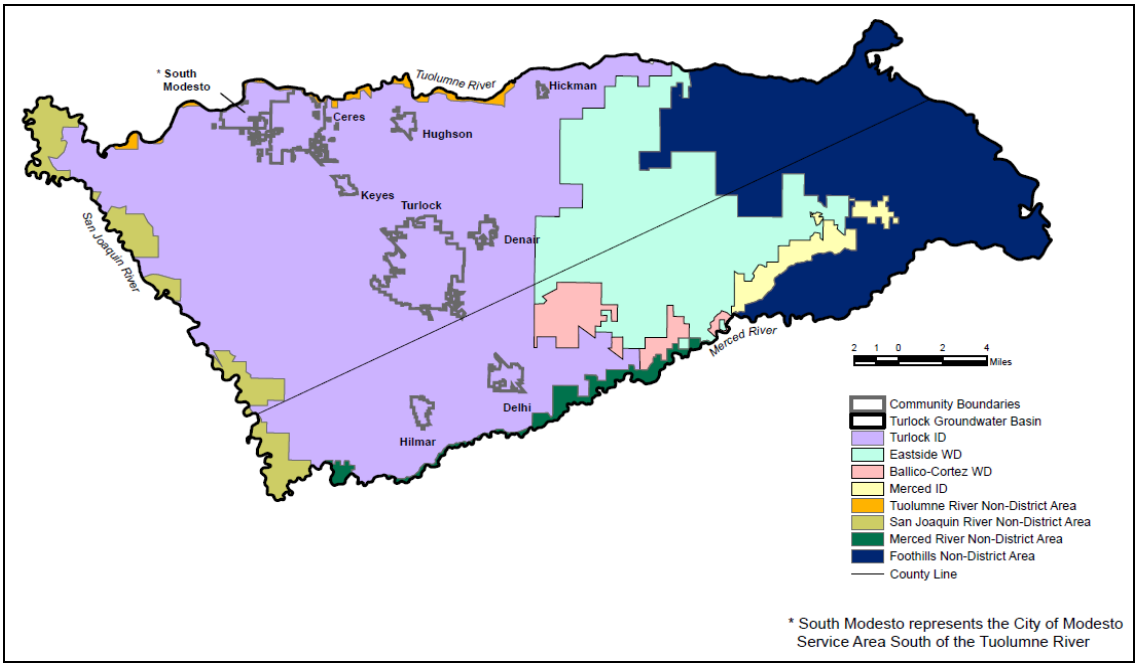
predominant land uses. The general trend in land use throughout the Sub-basin has been an increase in urbanization from less than 4,000 acres in 1952 to approximately 20,000 acres in 2006.

The majority of this urbanization has occurred within unincorporated urban areas and cities within the Turlock Irrigation District boundary. Land in the Eastside Water District, Ballico-Cortez Water District, and Merced Irrigation District has not seen the substantial increase in urbanization that has occurred in other portions of the Sub-basin. However, in the Eastside Water District, there has been a shift from non-irrigated lands to irrigated agriculture as the principal land use. The majority of this agricultural development occurred between 1952 and 1984; land use patterns in the Eastside Water District have generally stabilized since the mid-1980s. The shift to irrigated agriculture has occurred to a lesser extent in the Ballico-Cortez Water District. Land use patterns in the foothill areas in the eastern portion of the Sub-basin have also shifted from non-irrigated to irrigated agriculture, but most of this shift has occurred in recent years. Between 1952 and 1992, irrigated agriculture in the foothills non-district area increased gradually from 8,600 acres to 10,800 acres. Following 1992, irrigated area grew rapidly, reaching 19,500 acres in 2006, and 35,100 in 2014.

Urban land uses, irrigators in the Eastside and Ballico-Cortez water districts, and irrigators in the foothills and other non-District areas depend on groundwater for water supply. Increases in these types of land uses throughout the Turlock Sub-basin increase the demands on the groundwater supply. Consequently, evaluating the status of the groundwater supply and continuing coordination of water agencies are essential for maintaining the viability of the groundwater basin.

A map displaying the boundaries of the Turlock Sub-basin can be found in Figure 6-1.

Figure 6-1. Turlock Groundwater Basin Location and Boundaries



Source: Figure 2 from TGBA Groundwater Management Plan, March 2008.

6.2.2 Basin Overdraft Conditions

Overdraft of an aquifer occurs when groundwater extraction is faster than aquifer recharge. It is unsustainable to overdraft an aquifer over long periods of time. Overdraft can eventually lead to subsidence and water quality problems. As of 2015, the Basin is neither listed as adjudicated[1], nor in critical overdraft condition[2], nor is likely to enter a condition of adjudication.

Groundwater conditions within the Basin vary. Groundwater levels in the eastern areas have declined significantly since the 1960s while levels in the western areas of the Basin are high to the point of requiring pumping in certain areas to keep the groundwater from encroaching into the root zone of agricultural crops. The TGBA will continue its efforts to ensure a sustainably managed groundwater basin and prevent activities that could lead to overdraft.

6.2.3 Groundwater Management

Most of the local agencies within the Turlock Sub-basin, including the City, are part of the TGBA which was formed in 1995 (see Figure 6-1). The TGBA has completed numerous studies to better understand the Turlock Sub-basin groundwater system, coordinated groundwater monitoring, and developed and implemented Groundwater Management Plans. Per a Memorandum of Understanding (MOU) signed by 10 local agencies, including the City, the TGBA will likely be the GSA representing the Turlock Sub-basin in the statewide SGMA process. The deadline for the TGBA to become the GSA for the region is June 30, 2017. Over the next several years, the TGBA will be responsible for evaluating the additional information and data needs in the region and for developing a GSP for the Turlock Sub-basin. The GSP will be completed by January 31, 2022. All of the member agencies in TGBA agree that groundwater and surface waters within the Turlock Sub-basin are vitally important resources that provide the foundation for maintaining current and future water needs. Preservation of these resources is essential to maintaining the economic viability and prosperity of the Sub-basin area. It is the overall goal of the TGBA that groundwater will continue to be a reliable, safe, efficient, and cost-effective water supply. Basin Management objectives include:

- Maintain an adequate water level in the groundwater basin.
- Protect groundwater quality and implement measures, where feasible, to reduce the potential movement of existing contaminants.
- Monitor groundwater extraction to reduce the potential for land subsidence.
- Promote conjunctive use of groundwater and surface waters.
- Support and encourage water conservation.

[1] According to DWR's June 2011 Water Facts 3: Adjudicated Groundwater Basins publication available here: https://assets.documentcloud.org/documents/1310075/groundwater-legislation.pdf, the Turlock Basin is not adjudicated.

[2] According to DWR's January 2016 list of critically overdrafted basins available here: http://www.water.ca.gov/groundwater/sgm/pdfs/COD_BasinsTable.pdf, the Turlock Basin is not critically overdrafted.

A copy of TGBA's 2008 Groundwater Management Plan for the Turlock Groundwater Basin is available on the TID website at:
http://www.tid.com/sites/default/files/documents/tidweb_content/Groundwater%20Management%20Plan.pdf

6.2.4 Groundwater Sustainability

The Sustainable Groundwater Management Act of 2014 (SGMA), a three-bill legislative package composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), was passed in September 2014. The legislation provides a framework for sustainable management of groundwater supplies by local authorities, with a limited role for state intervention when necessary to protect the resource. The legislation lays out a process and a timeline for local authorities to achieve sustainable management of groundwater basins. It also provides tools, authorities and deadlines to take the necessary steps to achieve the goal. For local agencies involved in implementation, the requirements are significant and can be expected to take years to accomplish. The State Water Resources Control Board may intervene if local agencies do not form a Groundwater Sustainability Agency (GSA) and/or fail to adopt and implement a Groundwater Sustainability Plan (GSP).

The SGMA implementation steps and deadlines are shown in Table 6-1.

Table 6-1. Sustainable Groundwater Management Act and Deadlines

Implementation Step	Implementation Measure	Deadlines
Step One	Local agencies must form local Groundwater Sustainability Agencies (GSAs) within two years	June 30, 2017
Step Two	Agencies in basins deemed high- or medium-priority must adopt Groundwater Sustainability Plans (GSPs) within five to seven years, depending on whether a basin is in critical overdraft	January 31, 2020 for critically overdrafted basins January 31, 2022 for high- and medium-priority basins not currently in overdraft
Step Three	Once plans are in place, local agencies have 20 years to fully implement them and achieve the sustainability goal	January 31, 2040 for critically overdrafted basins January 31, 2042 for high- and medium-priority basins not currently in overdraft

SGMA applies to basins or sub-basins designated by DWR as high or medium priority basins, based on a statewide ranking that uses criteria including population and extent of irrigated agriculture dependent on groundwater. The final Basin Prioritization findings indicate that 127 of California's 515 groundwater basins and sub-basins are high and medium priority basins. These high and medium priority basins account for 96 percent of California's annual groundwater pumping and supply 88 percent of the population which resides over the groundwater basins. The ranking for the Turlock Sub-basin is shown in Table 6-2. As shown, the Turlock Sub-basin has been ranked as a High priority basin.

Table 6-2. Groundwater Basin Prioritization for Sustainable Groundwater Management Act[a]

Rank[b]	Basin Number	Sub-Basin Name	Overall Basin Ranking Score	Overall Basin Priority
38	5-22.03	Turlock	21.5	High

[a] CASGEM Groundwater Basin Prioritization Results, run version May 26, 2014.
[b] Out of a total of 515 basins, of which 127 were high- or medium-priority basins.

6.2.5 GSA and GSP Formation

The area's commitment to comply with SGMA was outlined in a recent Memorandum of Understanding (MOU) signed by local water agencies. Additionally, these agencies are cooperating to develop two GSAs and one GSP for the Turlock Sub-basin. The deadline for GSA formation for the basin is June 30, 2017, with completion of the GSP required by January 31, 2022.

While these GSA's are forming, the TGBA has begun the process of working through data needs and other issues, in preparation for developing a GSP.

6.2.6 Historical Groundwater Pumping

Groundwater pumping by the City over the last five years is summarized in Table 6-3 (DWR Table 6-1).

Table 6-3. Retail: Groundwater Volume Pumped (DWR Table 6-1)

Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Turlock Subbasin within the San Joaquin Valley Groundwater Basin	2,675	2,624.80	2,605	2,441	2,104.50
	TOTAL	2,675	2,625	2,605	2,441	2,105

NOTES: Volumes are in MG.

6.3 SURFACE WATER

The City does not currently use any surface water supply. As mentioned in Section 6.1, as a member of the SRWA, the City has entered into a water sales agreement for delivery of 1,825 MG per year (5 MGD) of TID surface water.

TID and Modesto Irrigation District (MID) jointly operate the Don Pedro Reservoir, from which water is diverted for end use with both TID and MID's agricultural and municipal and industrial (M&I) customers. The quality of this surface water supply is exceptionally high, with the City of Modesto regularly blending it with local groundwater to help the groundwater meet U.S. Environmental Protection Agency (EPA), and State Water Resource Control Board MCL requirements.

TID has several post-1914 water rights to the Tuolumne River, with diversion points at the Don Pedro Dam and La Grange Dam. A full listing of these water rights can be found through the State Water Resources Control Board's (SWRCB) California Integrated Water Quality System's (CIWQS) Electronic Water Rights Information Management System (e-WRIMS) (https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/). Due to TID's history and the established documentation of these rights, it is unlikely that they will be contested when the rights are used to supply water to SRWA for M&I use.

Surface water supplies more than 50% of the total irrigation water applied to land in the Turlock Sub-basin boundaries. Therefore, a majority of recharge originates from the Tuolumne River, and to a much lesser extent, the Merced River. The average volume of surface water imported into the Sub-basin between 1997 and 2006 was 540,000 AF/yr. A significant part of applied irrigation water percolates past the root zone to become groundwater, with deep percolation of applied surface water the largest single component of groundwater recharge. It is likely that the City's addition of surface water supply will not only reduce the necessity for groundwater pumping, but will also increase the rate of groundwater recharge in the Turlock Sub-basin.

6.4 STORMWATER

The City's storm water system includes approximately 86.4 miles of storm drain collection / conveyance piping, 39 pump stations, 49 detention basins, and use of the TID open channel irrigation system for the discharging storm waters.

The majority of the City's storm water drains to local detention basins. Although the primary purpose of these detention facilities is for urban runoff and flood control, they passively contribute to groundwater recharge through percolation of stored supplies. These detention facilities are managed in a way to maximize stored volume in order to maximize groundwater recharge as long as flood control concerns are low. As soon as wet weather events are in the forecast, the detention facilities are drained in order to create more space for storm water detention.

The remainder of the City's storm water that is not captured in detention basins or flows to TID laterals eventually drains into the Tuolumne River.

6.5 WASTEWATER AND RECYCLED WATER

The City currently manages wastewater collection and treatment for all except the northwest portion of the City. The City's wastewater treatment plant (WWTP) has been in its current location since before 1970. On average, the City's WWTP handles an inflow of 2.38 MGD for 2015. In the northwest portion of the City, the City manages the collection system, but exports wastewater to the Modesto trunk sewer system. The City also exports a significant portion of the wastewater treated at the City's WWTP to the Turlock Regional Water Quality Control Facility (RWQCF). The City's WWTP does not discharge any treated wastewater from its wastewater treatment plant to a river or any other surface water body. Instead, treated wastewater is either discharged into on-site ponds for evaporation and incidental groundwater recharge, or exported to Turlock.

The following summarizes the City's current methods of wastewater disposal:

- Approximately 1.3 MGD of wastewater flow from the northwestern portion of the City and an unincorporated county area adjacent to City limits is sent to the Modesto trunk sewer system for treatment and disposal at the City of Modesto's wastewater treatment facilities (land application, recycled water use, or discharge to the San Joaquin River);
- Wastewater flows from the remainder of the City are sent to the City's WWTP for treatment. Up to 2.0 MGD is disposed of through on-site percolation ponds for evaporation and incidental groundwater recharge. 1.0 MGD of treated effluent is sent to the City of Turlock for treatment and disposal at the Turlock RWQCF. The City is in the process of increasing its export capacity to 2.0 MGD.

6.5.1 Recycled Water Coordination

The cities of Ceres, Turlock and Modesto, and the Del Puerto Water District have historically worked together to identify regional opportunities for wastewater treatment and recycled water production. An example of a recent cooperative project is the North Valley Regional Recycled Water Program (NVRRWP), an effort to regionalize recycled water use in Stanislaus County. As envisioned, the NVRRWP could produce and deliver up to 30,600 AFA of disinfected tertiary treated recycled water to western Stanislaus County by 2018. By 2045, NVRRWP could deliver up to 59,900 AFA of recycled water. The source of recycled water includes treated wastewater from the Cities of Ceres, Turlock, and Modesto. As part of the project, the City of Turlock would install an additional 5.7 miles of conveyance pipeline to convey water directly from its Regional Water Quality Control Facility's tertiary treatment plant to the Delta-Mendota Canal (DMC). The Canal would be used to convey the blended canal-recycled water to users in the west side of the County. Funding from the USBR has been pursued for completion of feasibility studies related to the NVRRWP; however, no funding has been secured to date.

6.5.2 Wastewater Collection, Treatment, and Disposal

Wastewater treatment and disposal at the City's existing WWTP is regulated under Waste Discharge Requirements Order No. 93-237 (WDRs). These WDRs were prepared pursuant to the requirements of the Porter-Cologne Water Quality Control Act (Porter-Cologne) and the Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region, which includes Resolution No. 68-16, the State's anti-degradation policy. Because the City's WWTP discharges to land, it is not subject to the National Pollution Discharge Elimination System (NPDES) requirements for discharges to surface water.

Currently, approximately 1.3 MGD of wastewater flow from the North Ceres area of the collection system is exported to the City of Modesto's trunk sewer system for treatment and disposal at the City of Modesto's wastewater facilities. Approximately 1.0 MGD of treated wastewater is sent south to the City of Turlock for treatment at the Turlock RWQCF. The City is currently permitted to dispose of up to 2,800 AFY of wastewater at its on-site percolation ponds. The quality of this percolated water is monitored. As discussed previously, the City's treated wastewater is not discharged to a river or any other body of water at this site.

Due to the high cost of tertiary treatment compared with other wastewater disposal options, the City does not plan to develop tertiary treatment capacity to allow for recycled water use. Based on the City's current situation, past studies, current and anticipated regulatory requirements, and evaluation of cost needed to implement potentially feasible alternatives, the option of diverting

additional flow to both the City of Modesto and the City of Turlock is the most economically feasible long-range plan for the City's wastewater treatment and disposal.

Table 6-4. Retail: Wastewater Collected Within Service Area in 2015 (DWR 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 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
Add additional rows as needed						
City of Ceres	Metered	870	City of Turlcok	Turlock Regional Water Quality Control Facility	No	
Total Wastewater Collected from Service Area in 2015:		870				
NOTES: Volumes are in MG.						

Table 6-5 (DWR Table 6-3) identifies the volume of treated wastewater either recycled or disposed of within the service area.

Table 6-5. Retail: Wastewater Treatment and Discharge Within Service Area in 2015 (DWR Table 6-3)

☐	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
							2015 volumes			
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Wastewater Treatment Plant (WWTP)	Percolation ponds	On Site		Percolation ponds	No	Secondary, Undisinfected	870	346		
						Total	870	346	0	0
NOTES: Volumes are in MG.										

Table 6-6 (DWR Table 6-4) shows that the City did not utilize recycled water in 2015 or have projected use.

Table 6-6. Retail: Current and Projected Recycled Water Direct Beneficial Uses within Service Area (DWR Table 6-4)

☑	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.							
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035
Agricultural irrigation							
Landscape irrigation (excludes golf courses)							
Golf course irrigation							
Commercial use							
Industrial use							
Geothermal and other energy production							
Seawater intrusion barrier							
Recreational impoundment							
Wetlands or wildlife habitat							
Groundwater recharge (IPR)*							
Surface water augmentation (IPR)*							
Direct potable reuse							
Other *(Provide General Description)*							
		Total:	0	0	0	0	0
NOTES:							

Table 6-7 (DWR Table 6-5) shows that the City did not utilize recycled water in 2010 or 2015.

Table 6-7. Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (DWR Table 6-5)

☑	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.		
Use Type		**2010 Projection for 2015**	**2015 Actual Use**
Agricultural irrigation			
Landscape irrigation (excludes golf courses)			
Golf course irrigation			
Commercial use			
Industrial use			
Geothermal and other energy production			
Seawater intrusion barrier			
Recreational impoundment			
Wetlands or wildlife habitat			
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*Type of Use*		
Total		0	0
NOTES:			

6.5.3 Actions to Encourage and Optimize Future Recycled Water Use

The City has conceptually explored the possibility of upgrading its wastewater treatment plant for the production of tertiary-treated recycled water which could be used for irrigation purposes (and thus offset current and future potable water demands). Recycled water is considered to be a reliable water source because it is consistently available. A study was done to examine areas in the City where recycled water could be used (such as parks, landscape medians, golf courses, *etc.*). Detailed analyses showed that it would not be cost effective to build a tertiary treatment plant, and install dual piping (*e.g.,* purple pipe) to parks and other large landscaped areas within the City. The Regional Water Quality Control Board is also reluctant to add another surface water discharger to the San Joaquin River.

In addition to the available non-potable water pumped from the City's irrigation wells to irrigate several of its public parks, many areas within the City have access to inexpensive and high quality TID water for irrigation. In 2008, a total of 231 parcels within the City received irrigation water from TID. Because of the low cost and satisfactory nature of the current TID supplied irrigation water, it is unlikely that this can be replaced cost effectively by new, highly treated recycled water supplies. As a result of these factors, the City has determined that it is not economically feasible to implement recycled water and does not anticipate any future recycled water use, based on the economics of developing recycled water, compared with other wastewater disposal options.

No optimization plan is presented because the City has not found it cost effective to implement recycled water at this point in time. Therefore, as shown on Table 6-6, there are no identified measures to promote recycled water use. On a long-term basis, the City will continue to explore regionalization options and regional wastewater treatment opportunities.

Table 6-8. Retail: Methods to Expand Future Recycled Water Use (DWR Table 6-6)

☑	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
		Total	0
NOTES:			

6.6 DESALINATED WATER OPPORTUNITIES

Because the City is not located in a coastal area, seawater desalination is not applicable to the City and is not currently considered technically or economically feasible. In addition, the groundwater that underlies the City is not brackish in nature and does not require desalination. As such, the City does not have any plans to incorporate desalinated or treated brackish water into its supply portfolio.

6.7 EXCHANGES OR TRANSFERS

Currently there is no alternative potable water supply source in the area that would lend itself to transfer or exchange opportunities. Although there are three small potable water systems within the City's limits (owned and operated by the City of Modesto), these systems do not have excess capacity and already use the City of Turlock as a backup water source.

Although the City has entered into a water sales agreement for TID surface water, the infrastructure is not in place at this time. Additionally, because TID's currently available irrigation water is designated for agricultural use, there are practical and legal issues to consider if an exchange or transfer were to occur.

6.8 FUTURE WATER PROJECTS

As stated in Section 6.1, as a member of the Stanislaus Regional Water Authority (SRWA), the City has entered into a water sales agreement for delivery of 1,825 MG per year (5 MGD) of TID surface water.

In January 2016, the SRWA contracted with West Yost and Associates for program management services for the construction of a water treatment plant (WTP) and transmission pipelines to provide treated surface water from TID to the cities of Ceres and Turlock. Water would be released from the Don Pedro Reservoir, diverted from the Tuolumne River at an existing infiltration gallery, and pumped to the WTP by TID. It is currently anticipated that the TID water will be available to the City by 2020. Constraints and reliability of the project water are further discussed in Chapter 7. A summary of the City's expected future water supply programs is provided in Table 6-9 (DWR Table 6-7).

Table 6-9. Retail: Expected Future Water Supply Project or Programs (DWR Table 6-7)

Page 6-1	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
Regional Surface Water Supply Project	Yes	Stanislaus Regional Water Authority		2020	Average Year	5 MGD
NOTES: Volumes are in MG.						

6.9 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

The City's current and planned sources of water can be summarized as such:

- The City is currently contracted to purchase 1,825 MGY (5 MGD) of TID surface water.
- The City maintains 12 active, potable groundwater wells.
- Two wells drilled estimated online 1/2017 and 1/2018.
- The City neither currently uses nor plans to use surface water that is not mentioned above.
- The City maintains a series of storm water detention basins that contribute to groundwater recharge.
- The City currently does not utilize recycled water but will continue to explore regional wastewater treatment opportunities.
- The City neither currently uses nor plans to use desalinated water.
- The City neither currently nor plans to exchange or transfer water with other water systems.

The actual (2015) water supplies for the City are summarized in Table 6-10 (DWR Table 6-8).

Table 6-10. Retail: Water Supplies – Actual (DWR Table 6-8)

Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield
Add additional rows as needed				
Groundwater	City's domestic supply wells	2,105	Drinking Water	
Groundwater	Non-Potable park irrigation water	57	Raw Water	
	Total	2,161		0
NOTES: Volumes are in MG.				

The projected future water supplies for the City are summarized in Table 6-11 (DWR Table 6-9).

Table 6-11. Retail: Water Supplies – Projected (DWR Table 6-9)

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*							
		2020		2025		2030		2035	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Add additional rows as needed									
Groundwater		1,680		2,416		3,148		4,181	
Surface water		1,825		1,825		1,825		1,825	
Total		3,505	0	4,241	0	4,973	0	6,006	0

NOTES: Volumes are in MG.
In all year types, if demand cannot be met from Surface Water, it is assumed that groundwater will supply all remaining demand.
The City assumes 1,825 MGY of surface water from the Stanislaus Regional Water Supply Project will be available by 2020, however the project is still in the planning phase and this water may not be available until a later date.

6.10 CLIMATE CHANGE IMPACTS TO SUPPLY

National and international research over the last several decades has led to landmark scientific advancements and thus a universal consensus that the global climate is changing, in large part, due to human activities related to the generation of greenhouse gasses such as carbon dioxide. The sections below discuss the history and advancement in the City's understanding of climate change research and how climate change may impact the City's water supplies.

- Water Demand: Hotter days and nights, as well as a longer irrigation season, will increase landscaping and irrigation water needs, and industrial processes will have increased cooling water needs. Peak water demands may also be impacted.
- Water Supply and Quality: Reduced snowpack, shifting spring runoff to earlier in the year, increased potential for algal bloom, and increased potential for seawater intrusion; each has the potential to impact water supply, supply reliability and water quality.
- Sea Level Rise: It is expected that sea level will continue to rise, resulting in near shore ocean changes such as stronger storm surges, more forceful wave energy, and more extreme tides. This will also affect levee stability in low-lying areas and increase flooding.
- Natural Disaster: Natural disasters are expected to become more frequent as climate change brings increased climate variability, resulting in more extreme droughts and floods. This will challenge water supplier operations in several ways as wildfires are expected to become larger and hotter, droughts will become deeper and longer, and floods can become larger and more frequent.

6.10.1 IPCC

The Intergovernmental Panel on Climate Change (IPCC) was established to provide the decision-makers and others interested in climate change with an objective source of information about climate change. It was set up by the World Meteorological Organization and the United Nations Environment Programme, and has served since 1988 as a clearinghouse for research and policy discussions related to climate change. The role of the IPCC "…is to assess on a comprehensive, objective, open and transparent basis the latest scientific, technical and socio-economic literature

produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts and options for adaptation and mitigation ….". Agencies of the U.S. government have provided major input to both research and discussion, particularly through the U.S. Geological Survey.

The IPCC has issued five major "assessments" of the status of climate change research, current levels of understanding, and potential policy implications. The Fifth Assessment Report was finalized and made available in November 2014. The historical and projected continued warming of the earth has and will continue to cause changes to our climate. While such induced "climate change" has implications to a number of environmental factors, relevant to this discussion are potential effects on water supply reliability.

6.10.2 DWR

DWR maintains an updated web site on climate change and California's water resources (www.water.ca.gov/climatechange). That web site notes, in part: "Climate change is already impacting California's water resources. In the future, warmer temperatures, different patterns of precipitation and runoff, and rising sea levels will profoundly affect the ability to manage water supplies and other natural resources. Adapting California's water management systems to climate change presents one of the most significant challenges for the 21st century". In 2006, DWR published a major report on climate change and California's water resources, "Progress on Incorporating Climate Change Into Management of California's Water Resources". This was summarized and updated in a paper published in a special issue of the Journal of Climate Change in 2008 (http://wwwdwr.water.ca.gov/climatechange/docs/CCprogress_mar08.pdf). In 2010, DWR provided another update entitled "Climate Change Characterization and Analysis in California Water Resources Planning Studies" (http://www.water.ca.gov/climatechange/docs/DWR_CCCStudy_FinalReport_Dec23.pdf). This report provides a summary of the climate change characterization approaches and methodologies that have been used in recent planning studies conducted by DWR and its partner agencies.

6.10.3 California Water Plan

The State of California has provided major focus and funding on climate change research and impacts, with particular focus on developing both "adaptation" and "mitigation" strategies. In the context of climate change and its impacts to water resources, "adaptation" is simply the identification and development of strategies to cope with the expected impacts to water supply reliability. "Mitigation" is the identification and development of actions that will reduce the drivers for climate change; for the most part this translates into programs to reduce greenhouse gas emissions and lower the "carbon footprint" of activities associated with water supply and use.

The State's research and continuing recommendations are readily available. The State's Climate Action Team has noted a clear connection between water use and energy consumption, and consequently also with greenhouse gas production (see California Climate Change Portal for the most recent technical and policy information: www.climatechange.ca.gov). The 2005 California Water Plan Update addressed climate change and water in a general way, noting the many potential interconnections as well as the potentially serious effects of ongoing climate change on water supply reliability. The 2009 Update to the California

Water Plan addresses this topic in a more substantive way (www.waterplan.water.ca.gov/climate/index.cfm), and includes recommendations and advice on how to incorporate climate change considerations into long-term water resources planning. The California Water Plan was updated again in 2013: (http://www.waterplan.water.ca.gov/cwpu2013/final/index.cfm), and further discusses declining environmental trends, as well as advancing 17 objectives to help California deal with a changing climate.

6.10.4 Potential Impacts on Turlock Sub-basin Groundwater

Despite the high level of attention to climate change both in California and internationally, there is little information developed on the potential impacts to groundwater. Groundwater specific concerns include:

- Increased pumping of groundwater by water suppliers in the sub-basin due to decreased reliability of surface water supplies, leading to basin overdraft conditions.
- Decreased groundwater recharge due to changes in surface water hydrology.

These groundwater specific concerns can be somewhat mitigated by the City's water service agreement for surface water from TID, however this supply is not without uncertainties. An evaluation of climate change-related impacts to the City's groundwater supply may be appropriate to be included in the 2020 UWMP.

6.10.5 Potential Impacts on Surface Water from TID

In a 2012 report, "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," TID (in conjunction with SFPUC and Hydrocomp Inc.) assessed the sensitivity of runoff into Don Pedro Reservoir to a range of changes in temperature and precipitation due to climate change. A copy of the report can be found online (http://bairwmp.org/docs/climate-change/Bay%20Area%20Impacts/Water%20Supply/SFPUC%202012%20Sensitivity%20of%20Upper%20Tuolumne%20River%20Flow%20to%20Climate%20Change%20Scenarios.pdf/view), with the modeled scenarios resulting in the following key conclusions:

- With differing increases in temperature alone, the median annual runoff at Don Pedro Dam would decrease by 1.1 to 3.0 percent from present-day conditions by 2040 and by 3.6 to 10.1 percent from present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Don Pedro Dam would decrease by 9.5 to 10.7 percent from present-day conditions by 2040 and by 28.7 to 32.3 percent from present-day conditions by 2100.
- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 48.1 percent from present day conditions by 2100 utilizing the same climate change scenarios.
- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.

- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.
- Climate change effects are most exacerbated in low runoff years because of increased evapotranspiration, particularly when expressed as a percent of runoff.

The above supply reductions, when compared to an increase in estimated future water demand due to population growth, show that the City may need to procure additonal water supplies beyond the year 2035. Examining water supplies needs beyond 2035 is beyond the planning horizon of the 2015 UMWP, however climate change impacts on future supply needs should be considered in the 2020 UWMP.

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Chapter 7 Water Supply Reliability Assessment

CHAPTER 7
Water Supply Reliability Assessment

This chapter describes the long term reliability and vulnerability of the City's water supplies. The City's planned and implemented water management tools for increasing the reliability of water supplies are also addressed. Short term reliability planning that may require immediate action, such as drought or a catastrophic supply interruption, is addressed in Chapter 8.

Where applicable, each section in this chapter addresses groundwater, surface water, and recycled water in a separate sub-section. The groundwater sub-section refers to the City's current supplies from the Turlock Sub-basin, the surface water sub-section to the SRWA's water sales agreement of Tuolumne River water from TID (as described in Chapter 6), and the recycled water sub-section to the current and future recycled water produced from the WWTP.

7.1 CONSTRAINTS ON WATER SOURCES

This section addresses potential effects on the reliability of water supply sources through the year 2035.

Constraints on water resources for specific communities are addressed by CWC section 10631(c)(2) and section 10634, which state the following:

> *CWC 10631(c)(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or cl atic factors, describe plans to supplement or replace that source with alternative sources or water demand in management measures, to the extent practicable.*
>
> *CWC 10634 The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.*

The City has (or will have) the following sources of water supply:

- groundwater , and
- treated surface water.

The major constraints on each of these supplies are discussed in the following sections:

- environmental constraints,
- legal constraints, and
- water quality constraints.

7.1.1 ENVIRONMENTAL CONSTRAINTS

Environmental factors can limit the reliability of surface water supplies in the event that dry year supply reductions are necessary to maintain the health of aquatic species and the environment in general. Given the fragile state of many of California's ecosystems, environmental concerns inevitably arise during the water planning process. The delicacy of these systems can, in turn, cause a lack of supply due to the enforcement of environmental legislation. The recent legal actions involving the Endangered Species Act in the Delta are an example of the clash between

environmental concerns and water supply. To ensure reliability of the City's water supply, during unexpected environmental constraints that may be placed on, the City will continue to utilize local groundwater in place of surface water.

A further concern is the potential for overdraft and diminishing water quality of the Turlock Sub-basin which has prompted the City to seek an alternative primary water supply (i.e. surface water). For the purposes of this study, the concern of overdraft is considered a long-term groundwater basin issue rather than a supply inconsistency. The TGBA GMP includes actions to address cooperative management of groundwater to prevent further overdraft and the new SGMA process, of which the City is taking part, will address in its GSP in 2022.

7.1.2 Legal Constraints

Legal issues, including place of use and water rights issues, are not expected to limit supply reliability for the City.

7.1.2.1 Groundwater

The Turlock Sub-basin is not an adjudicated groundwater basin, as defined by DWR. Therefore, there are no defined legal pumping rights for the City, and there are no legal constraints on groundwater pumping. In California, the State is not currently authorized by the Water Code to manage groundwater. California landowners have a correlative right to extract groundwater for beneficial use. As a municipal water supplier, the City acts on behalf of the overlying landowners, who rescind their water rights to the City when the land is annexed into the City.

The implementation of SGMA, described in Section 6.2, has introduced provisions whereby the state can step in to manage a groundwater basin if a local GSA does not properly implement sustainable groundwater management. While the information included in this section is current as of 2015, conditions may change between the writing of this UWMP and the adoption of the 2020 UWMP.

7.1.2.2 Surface Water

For the City, through the SRWA, to purchase Tuolumne River water from TID and use it for a municipal supply (further described in Chapter 6), a portion of TID's water rights will need to be modified for the change in use from agricultural to municipal and industrial supply. No major legal constraints associated with this process are currently expected.

Additionally, the Federal Energy Regulatory Commission (FERC) operations license for the Don Pedro Reservoir that is used to store TID's Tuolumne River surface water is set to expire in 2016. In anticipation, TID and MID have followed FERC's Integrated Licensing Process (ILP), leading to a Final Draft Application submittal in 2014. No major legal issues associated with the relicensing of the reservoir are anticipated.

One other potential legal constraint would be the adoption of the draft Substitute Environmental Document (SED) in support of potential changes to the water quality control plan for the Bay-Delta. This plan outlines several changes to the Bay-Delta Plan, including modifying the flows of several rivers (including the Tuolumne) in order to support and maintain the natural production of viable native Lower San Joaquin River watershed fish populations migrating through the Delta. If approved, this SED could mandate up to 60% of unimpaired Tuolumne River water flow be available downstream, resulting in reduced availability of surface water for withdrawal by TID (and therefore the City through the SRWA). The City will continue to monitor the situation as additional information becomes available.

7.1.2.3 Recycled Water

As described in Chapter 6, the City currently does not utilize recycled water. On a long-term basis, the City will continue to explore regionalization options and regional wastewater treatment opportunities. No major legal issues associated with recycled water facility expansion are anticipated.

7.1.3 Water Quality Constraints

The potential water quality constraints on groundwater, surface water, and recycled water supplies are discussed below.

7.1.3.1 Groundwater

The 2008 GMP identified several groundwater constituents that may lead to groundwater quality concerns in the basin. Contaminants in the area include: salinity, nitrate, arsenic, tetrachloroethylene, pesticides, iron, manganese, radio-nucleotides, bacteria and other petroleum hydrocarbons. Of the above contaminants, those with the highest potential for future impacts are further detailed below.

7.1.3.1.1 Salinity

Salinity has been identified as a source of contamination in the Turlock Groundwater Sub-Basin. Salinity levels within the sub-basin range from 90 to greater than 1,250 milligrams per liter (mg/L), as measured by total dissolved solids (TDS). Groundwater salinity is generally lowest in the easterly portion of the Turlock Sub-basin and the City reported an average value of 490 mg/L in its drinking water supply in the 2014 Annual Water Quality Report. No samples were taken during the 2015 calendar year. While salinity appears to be increasing, it is an unregulated contaminant and the City does not consider it a threat to its water supply.

It should be noted, however, that several other water suppliers in the area are members of the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) program, with the stated objective to organize, facilitate and fund efforts needed for the efficient management of salinity in the Central Valley. Although the City is not currently a member of CV-SALTS, it does participate through its membership with Central Valley Clean Water Association (CVCWA). The City will continue to monitor salinity levels in the basin and act accordingly.

7.1.3.1.2 Nitrates

Nitrates have been identified as a source of contamination in the Turlock Groundwater Sub-Basin. While nitrate in irrigation water is not a major concern for most crops, high concentrations of nitrate in groundwater is a concern for potable water supplies.

Historically, the City has reported nitrate concentrations as mg/L nitrate (as Nitrate, NO_3), however as of January 1, 2016, the SWRCB has mandated that all nitrate results be reported in the form of mg/L nitrate (as Nitrogen, N). The SWRCB reports that this change does not represent a functional change in the MCL, but is to reduce confusion and ease reporting of results to U.S. EPA. The maximum contaminant level (MCL) for nitrate (as Nitrate, NO_3) in public drinking water supplies is 45 mg/L and for nitrate (as Nitrogen, N) is 10 mg/L.

In the 2015 Annual Water Quality Report, the City reported an average nitrate concentration of 29.08 mg/L (as Nitrate, NO3). Under the new reporting methodology, this represents an average concentration of 6.6 mg/L nitrate (as Nitrogen, N). This value, irrespective of reporting methodology, is still well below the MCL, and shows that nitrate concentrations are generally within a safe range and should not pose a problem in the near future.

7.1.3.1.3 Arsenic

Arsenic has been identified as a source of contamination in the Turlock Groundwater Sub-Basin. In the 2015 Annual Water Quality Report, the City indicated an average arsenic concentration of 6.49 µg/L in its drinking water supply. The maximum contaminant level (MCL) for arsenic was reduced from 50 parts per billion (ppb) to 10 ppb in 2006. Well 32 is currently being treated for Arsenic and Manganese with the raw water arsenic concentration average of 14.5 µg/L and a treated average of 5.52 µg/L. The City continues to regularly monitor arsenic levels in its water supplies.

7.1.3.1.4 Radiological

Radiologicals have been identified as a source of contamination in the Turlock Groundwater Sub-Basin. In the 2015 Annual Water Quality Report, the City indicated an average Uranium concentration of 12.61 pCi/L in its drinking water supply. The maximum contaminant level (MCL) for Uranium is 20 pCi/L. The City has registered radiological concentrations slightly over the MCL value. The well was removed from active status, after going over a four quarter average. The City is currently working on a plan to treat this well so it can be brought back online.

7.1.3.1.5 Pesticides

Two pesticides resulting from past agricultural activities have been detected in the Turlock Sub-basin: Dibromochloropropane (DBCP) and Ethylenedibromide (EDB). The use of DBCP and EDB has been banned for several decades because neither is considered a future threat to groundwater supplies. The City will continue to monitor contamination from other known ***pesticides in its groundwater wells.***

7.1.3.1.6 Tetrachloroethylene

Tetrachloroethylene has been identified as a source of contamination in the Turlock Groundwater Sub-basin. The maximum contaminant level (MCL) is 5µg/L. In its 2014 Annual Water Quality

Report, the City reported an average concentration of 1.33 µg/L. However, several wells throughout the City do show moderate levels of PCE; in response, the City has initiated additional groundwater monitoring.

Upon analysis of the results, the City will weigh options and select a course of action in the best interest of the community.

7.1.3.1.7 TCP- 1,2,3-Trichloropropane

TCP, or 1,2,3-Trichloropropane, has been identified as a source of contamination in the Turlock Groundwater Sub-Basin. In the 2015 Annual Water Quality Report, the City indicated an average TCP concentration of 0.049 µg/L in its drinking water supply. TCP levels in drinking water are currently unregulated, but the State Water Resources Control Board is in the process of developing a (MCL) for TCP. The Public Health Goal for TCP is 0.0007 µg/L. The City is examining TCP treatment alternatives.

7.1.3.2 Surface Water

According to the 2013 Don Pedro Water Quality Assessment (http://www.donpedro-relicensing.com/Documents/P-2299_DP_ISR_W-AR-01_WtrQltyAssmt_StdyRept_130117.pdf) the Tuolumne River water has low specific conductivity and hardness, is prone to acidification, and potential sources of local contamination are limited. The majority of analytes were reported as either non-detectable or just above reporting limit concentrations. Further, there does not appear to be a pattern of increasing chemical concentrations from upstream to downstream of Don Pedro Dam, implying that contamination due to retention in the reservoir is not an issue.

7.2 RELIABILITY BY TYPE OF YEAR

This section addresses the reliability of the City's water supply in average, single dry, and multiple dry water years. The City uses the following water year definitions from the DWR 2015 Guidebook:

- **Average year**: a year, or an averaged range of years, that most closely represents the average water supply available to the agency. For the purposes of this UWMP, the terms "normal" and "average" are used interchangeably.
- **Single-dry year**: the year that represents the lowest water supply available to the agency.
- **Multiple-dry year period**: the period that represents the lowest average water supply availability to the agency for a consecutive multiple year period (three years or more).

The reliability of the potable water supply is discussed below.

7.2.1 Supply Reliability

As discussed in Section 6.2, groundwater supplies are used to meet all of the City's current water needs. The ability of groundwater supply wells to produce water is not expected to be affected by severe or prolonged drought conditions. Aquifer levels are expected to remain within the historical range and equipment maintenance and backup power supplies are generally adequate to ensure a high degree of reliability. Instead, the reliability of the native groundwater supply is limited by the constraints described in the previous section of this chapter.

The water quality and overdraft constraints discussed in previous sections led the City to pursue TID surface water from the Tuolumne River through the SRWA. Due to this surface water not previously being available to the City, historic base year data for average, single-dry, and multiple-dry years is not available. As mentioned in Chapter 6, the increase in surface water deliveries within the basin as a result of the SRWA Regional Surface Water Supply Project are expected to have a positive impact on groundwater recharge within the region as 1) a portion of the recharge water will have originated outside of the basin, contributing towards a net basin inflow, and 2) the quantity of groundwater pumping by the City will decrease.

Supply percentages for base years are summarized in Table 7-1 (DWR Table 7-1).

Table 7-1. Retail: Basis of Water Year Data (DWR Table 7-1)

Year Type	Base Year *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000*	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	% of Average Supply
Average Year	1992	~	100%
Single-Dry Year	1999	~	100%
Multiple-Dry Years 1st Year	1987	~	100%
Multiple-Dry Years 2nd Year	1988	~	100%
Multiple-Dry Years 3rd Year	1989	~	100%
NOTES: Volumes are in MG. In all year types, if demand cannot be met from Surface Water project, it is assumed that groundwater will supply all remaning demand.			

7.3 SUPPLY AND DEMAND ASSESSMENT

Requirements for water supply and demand assessment are addressed in CWC section 10635(a), which states the following:

> *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.*

For the water supply and demand assessment, demand projections for the period of 2020 through 2035 are taken from Table 4-4 (DWR Table 4-2) in Chapter 4 of this document. The supply projections are assumed to equal the sum of the surface water, and groundwater supplies summarized above.

7.3.1 Normal Year

The availability of the City's supplies in Normal Years are described in detail in Chapter 6 and summarized below:

- 3,505 MG (year 2020) – 6,006 MG (year 2035) of groundwater from the City's wells in the Turlock Sub-basin
- 1,825 MG (year 2020-2035) of surface water from the Stanislaus Regional Water Supply Project

As shown in Table 7-2 (DWR Table 7-2), the City's Normal Year supplies are adequate to meet projected Normal Year demands. If necessary, the City plans to meet any additional demand through increased groundwater pumping, ensuring the City will maintain 100% supply reliability. Alternatively, if there is any disruption in surface water supply, the City will increase groundwater pumping to compensate.

Table 7-2. Retail: Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2020	2025	2030	2035
Supply totals *(autofill from Table 6-9)*	3,505	4,241	4,973	6,006
Demand totals *(autofill from Table 4-3)*	3,505	4,241	4,973	6,006
Difference	0	0	(0)	(0)

NOTES: Volumes are in MG.
In all year types, if demand cannot be met from Surface Water alone, it is assumed that groundwater will supply all remaining demand.
The City assumes 1,825 MG of surface water from teh Stanislaus Regional Water Supply Project will be available by 2020, however the project is still in the planning phase and this water may not be available until a later date.

7.3.2 Single Dry Year

The City's water supplies and demands for a Single Dry Year are assumed to be equivalent to those for a Normal Year.

As shown in Table 7-3 (DWR Table 7-3), the City's Single Dry Year supplies are adequate to meet projected Single Dry Year demands. If necessary, the City plans to meet any additional demand through increased groundwater pumping, ensuring that the City will maintain 100% supply reliability. Alternatively, if there is any disruption in surface water supply, the City will increase groundwater pumping to compensate.

Table 7-3. Retail: Single Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2020	2025	2030	2035
Supply totals	3,505	4241	4,973	6,006
Demand totals	3,505	4241	4,973	6,006
Difference	0	0	0	0

NOTES: NOTES: Volumes are in MG.
In all year types, if demand cannot be met from Surface Water alone, it is assumed that groundwater will supply all remaining demand.
The City assumes 1,825 MG of surface water from teh Stanislaus Regional Water Supply Project will be available by 2020, however the project is still in the planning phase and this water may not be available until a later date.

7.3.3 Multiple Dry Year

The City's water supplies and demands for Multiple Dry Years are assumed to be equivalent to those for a Normal Year and Single Dry Year.

As shown in Table 7-4 (DWR Table 7-4), the City's Multiple Dry Year supplies are adequate to meet projected Multiple Dry Year demands. If necessary, the City plans to meet any additional demand through increased groundwater pumping and water conservation, ensuring that the City will maintain 100% supply reliability. Alternatively, if there is any disruption in surface water supply, the City will increase groundwater pumping to compensate.

Table 7-4. Retail: Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)

		2020	2025	2030	2035
First year	Supply totals	3,505	4241	4,973	6,006
	Demand totals	3,505	4241	4,973	6,006
	Difference	0	0	0	0
Second year	Supply totals	3,505	4241	4,973	6,006
	Demand totals	3,505	4241	4,973	6,006
	Difference	0	0	0	0
Third year	Supply totals	3,505	4241	4,973	6,006
	Demand totals	3,505	4241	4,973	6,006
	Difference	0	0	0	0

NOTES: NOTES: Volumes are in MG.
In all year types, if demand cannot be met from Surface Water alone, it is assumed that groundwater will supply all remaining demand.
The City assumes 1,825 MG of surface water from teh Stanislaus Regional Water Supply Project will be available by 2020, however the project is still in the planning phase and this water may not be available until a later date.

7.4 REGIONAL SUPPLY RELIABILITY

Requirements for water supply and demand assessment are addressed in CWC section 10620(f), which states the following:

> *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.*

All water consumed by the City, including the future surface water from TID, is under the jurisdiction of the Central Valley Regional Water Quality Control Board, and is therefore considered from local supply sources. No water is imported from other regions, nor does the City anticipate importing water from other regions throughout the UWMP planning period.

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Chapter 8. Water Shortage Contingency Planning

CHAPTER 8
Water Shortage Contingency Planning

This chapter describes the City's Drought Preparedness and Response Planning (DPRP) which establishes actions and procedures for managing water supply and water demand during water shortages. The DPRP's purpose is to minimize non-essential uses of water and conserve remaining supplies for the benefit of the public. The City's DPRP is described by the Drought Preparedness water rationing stages resolution No. 2014-27, the Ceres Municipal Code section 13.04.130 (Appendix F) and the Water System Emergency Response Plan (Appendix G).

8.1 STAGES OF CONSERVATION

The City's Drought Preparedness and Response Planning (Appendix G) describes the three water conservation stages of the DPRP. Stage one is the least prohibitive while stage three is the most prohibitive. As stated by the Ceres Municipal Code (CMC) 13.04.130 and section three of the City's Drought Preparedness and Response Plan, the Director of Public Works is authorized to enact water conservation stages at his/her discretion. Table 8-1 (DWR Table 8-1) summarizes the three stages with their corresponding water supply percent reductions and water supply conditions.

Table 8-1. Retail: Stages of Water Shortage Contingency Plan (DWR Table 8-1)

Stage	Complete Both	
	Percent Supply Reduction[1] *Numerical value as a percent*	Water Supply Condition (*Narrative description*)
Add additional rows as needed		
I	10%	Drought Preparedness & Response Plan Section 12.1
II	20 - 30%	Drought Preparedness & Response Plan Section 12.2
III	50%	Drought Preparedness & Response Plan Section 12.3
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES:		

8.2 PROHIBITIONS OF END USES

The City's Municipal Code contains multiple sections outlining acceptable outdoor landscape watering practices, prohibited water uses, and acts constituting water wasting. The statutes contained in these sections are in effect at all times, irrespective of the water conservation stage the City is enforcing. The City is currently enforcing Stage II of the Drought Preparedness Response Plan.

8.2.1 Outdoor Landscape Watering (Ceres Municipal Code 13.04.130 Section A-1-a)

a. No lawn/garden watering, or other outdoor use, will be allowed between twelve o'clock (12:00) noon and seven o'clock (7:00) p.m. every day.

b. Dwellings or establishments which end with an odd number are authorized to water only on Sunday, Wednesday, and Friday.

    a. Outdoor watering limited to two days per week, Wednesday and Sunday for odd addresses (Per Stage II of the Resolution No. 2014-27).

c. Dwellings or establishments which end with an even number are authorized to water only on Tuesday, Thursday, and Saturday.

    a. Outdoor watering limited to two days per week, Tuesday and Saturday for even addresses (Per Stage II of the Resolution No. 2014-27).

d. No dwellings or establishment may use outdoor water on Monday unless a determination is made of special circumstances by the Director of Public Works or his or her designee. In no case shall any facility water more than three (3) days a week.

    a. No watering is permitted on Monday, Thursday, or Friday (Per Stage II of the Resolution No.2014-27).

8.2.2 Water Use Prohibitions (Ceres Municipal Code 13.04.130 Section A-1)

a. Washing vehicles, equipment or boats using an open hose which is not equipped with a shut-off nozzle is prohibited and a violation of this chapter.

b. Watering outdoor landscaping while raining.

8.2.3 Acts Constituting Water Wasting (Ceres Municipal Code 13.04.130 Section A-1)

a. Failure to comply with the City of Ceres Drought Preparedness and Response Plan, any conservation stage declared thereunder, and/or any guidelines or outdoor landscape watering schedules in effect pursuant thereto.

b. Watering outdoor landscape areas or gardens such that excess water leaves the property or area being watered.

c. Watering outdoor landscaping while raining.

d. Washing vehicles, equipment or boats during restricted days or hours; and/or using an open hose not equipped with a quick-action automatic shut-off valve while so doing.

e. Hosing down driveways, streets, sidewalks, parking lots, and building exteriors without the consent of the Director of Public Works or his/her designee. If consent is given, any restrictions on the frequency, timing, or method would remain in effect unless a health or safety condition existed.

f. Having leaky faucets or plumbing fixtures on the premises.

g. Operating evaporated coolers which are not equipped with a recirculating pump.

8.2.4 Stages of Conservation: Stage 1 (Drought Preparedness & Response Plan Section 11.1)

When Stage 1 of the DPRP is in effect, the City's target demand reduction will be 10 percent. In addition to the above Outdoor Landscape Watering, Water Use Prohibitions, and Acts Constituting Water Wasting, the following mandatory conservation compliance measures will apply:

- Limit residential and commercial landscape irrigation to no more than three assigned days per week on a schedule established by the City.

    1. Addresses ending in an even number 0, 2, 4, 6, 8 may water on Tuesday, Thursday, & Saturday.
    2. Addresses ending in an odd number 1, 3, 5, 7, 9 may water on Sunday, Wednesday, & Friday.
    3. No outdoor watering on Monday or between the hours of 12:00 noon to 7:00 pm for all residents.

- Stop washing down paved surfaces, including but not limited to sidewalks, driveways, parking lots, tennis courts, or patios, except when it is necessary to alleviate safety or sanitation hazards.

- Stop water waste resulting from inefficient landscape irrigation, such as runoff, low head drainage, or overspray, etc. Similarly, stop water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.

- Irrigate residential and commercial landscape before 12 a.m. and after 7 p.m. only.

- Use a hand-held hose equipped with a positive shut-off nozzle to water landscaped areas, including trees and shrubs located on residential and commercial properties that are not irrigated by a landscape irrigation system during your watering days and times.

- Irrigate nursery and commercial grower's products before 12 a.m. and after 7 p.m. only. Watering is permitted when a drip/micro-irrigation system/equipment is used. Irrigation of nursery propagation beds is permitted at any time. Watering of livestock is permitted at any time.

- Use re-circulated water to operate ornamental fountains.

- Request a water waiver to wash vehicles using a hand-held hose with positive shut-off nozzle, mobile high pressure/low volume wash system, or at a commercial site that re-circulates (reclaims) water on-site.

- Serve and refill water in restaurants and other food service establishments only upon request.

- Repair all water leaks within 24 hours of notification by the City unless other arrangements are made with the Public Works Department.

- Use recycled or non-potable water for construction purposes when available.

8.2.5 Stages of Conservation: Stage 2 (Drought Preparedness & Response Plan Section 11.2)

When Stage 2 of the DPRP is in effect, the City's target demand reduction will be 20 to 30 percent. In addition to the above Outdoor Landscape Watering, Water Use Prohibitions, Acts Constituting Water Wasting, and Stage 1 measures, the following mandatory conservation compliance measures will apply:

- Limit residential and commercial landscape irrigation to no more than two assigned days per week on a schedule established by the City.

    1. Addresses ending in an even number 0, 2, 4, 6, 8 may water on Tuesday & Saturday.
    2. Addresses ending in an odd number 1, 3, 5, 7, 9 may water on Wednesday & Sunday.
    3. No outdoor watering on Monday, Thursday and Friday.
    4. No outdoor watering between 12:00 noon to 7:00 pm for all residents.
    5. Outdoor watering is only permitted with the use of a hose or shutoff nozzle.

- This section shall not apply to commercial growers or nurseries.

- Limit lawn watering and landscape irrigation uses of sprinklers to no more than ten (10) minutes per watering station per day.

    1. This provision does not apply to landscape irrigation systems using water efficient devices, including but not limited to: weather based controllers, drip/micro-irrigation systems and stream rotor sprinklers.

- Repair all leaks within 24 hours of notification by the City unless other arrangements are made with the Public Works Department.

- Stop operating ornamental fountains or similar decorative water features unless recycled water is used.

- During the Stage 2 Drought Response the Deputy Director of Public Works shall have the authority to deny Water Waivers to ensure adequate water supply for the general public unless a health or safety condition exist.

8.2.6 Stages of Conservation: Stage 3 (Drought Preparedness & Response Plan Section 11.3)

When Stage 3 of the DPRP is in effect, the City's target demand reduction will be 50 percent. In addition to the above Outdoor Landscape Watering, Water Use Prohibitions, Acts Constituting Water Wasting, as well as Stages 1 and 2 measures, the following mandatory conservation compliance measures will apply:

- Stop all outdoor watering.
- This section shall not apply to commercial growers or nurseries.
- Stop filling or re-filling ornamental lakes or ponds, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a drought response level under this ordinance.
- Stop washing vehicles except at commercial carwashes that re-circulate water, or by high pressure/low volume wash systems.
- Repair all leaks within 24 hours of notification by the City unless other arrangements are made with the Public Works Department.
- Additionally, no new potable water service shall be provided, no new temporary meters or permanent meters shall be provided, and no statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates or letters of availability) shall be issued, except under the following circumstances:

    1. A valid, unexpired building permit has been issued for the project; or
    2. The project is necessary to protect the public's health, safety, and welfare; or
    3. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of City.

- This provision shall not be construed to preclude the resetting or turn-on of meters to provide continuation of water service or to restore service that has been interrupted for a period of one year or less.
- During Stage 3 of the Drought Response the Deputy Director of Public Works shall have the authority to deny Water Waivers to ensure adequate water supply for the general public unless a health or safety condition exist.

The above prohibited uses are summarized in Table 8-2 (DWR Table 8-2).

Table 8-2. Retail Only: Restrictions and Prohibitions on End Uses (DWR Table 8-2)

Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
ALL	Landscape - Limit landscape irrigation to specific times	Ceres Municipal Code: A-1 (a-1)	Yes
ALL	Landscape - Limit landscape irrigation to specific days	Ceres Municipal Code: A-1 (a-2,3)	Yes
ALL	Landscape - Restrict or prohibit runoff from landscape irrigation	Ceres Municipal Code: A-1 (b)	Yes
ALL	Landscape - Prohibit certain types of landscape irrigation	Ceres Municipal Code: A-1 (c)	Yes
ALL	Other - Require automatic shut of hoses	Ceres Municipal Code: A-1 (d)	Yes
ALL	Other - Prohibit use of potable water for washing hard surfaces	Ceres Municipal Code: A-1 (e)	Yes
ALL	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Ceres Municipal Code: A-1 (f)	Yes
I	Landscape - Limit landscape irrigation to specific times	Ceres Municipal Code: A-1 (a-1)	Yes
I	Landscape - Limit landscape irrigation to specific days	Ceres Municipal Code: A-1 (a-2,3)	Yes
I	Landscape - Restrict or prohibit runoff from landscape irrigation	Ceres Municipal Code: A-1 (b)	Yes
I	Other - Require automatic shut of hoses	Ceres Municipal Code: A-1 (d)	Yes
I	Other - Prohibit use of potable water for washing hard surfaces	Ceres Municipal Code: A-1 (e)	Yes
I	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Ceres Municipal Code: A-1 (f)	Yes
I	Water Features - Restrict water use for decorative water features, such as fountains	Drought Preparedness & Response Plan Section 11.1	Yes
I	CII - Restaurants may only serve water upon request	Drought Preparedness & Response Plan Section 11.1	Yes
II	Landscape - Limit landscape irrigation to specific times	Ceres Municipal Code: A-1 (a-1)	Yes
II	Landscape - Limit landscape irrigation to specific days	Ceres Municipal Code: A-1 (a-2,3)	Yes
II	Landscape - Restrict or prohibit runoff from landscape irrigation	Ceres Municipal Code: A-1 (b)	Yes
II	Other - Require automatic shut of hoses	Ceres Municipal Code: A-1 (d)	Yes
II	Water Features - Restrict water use for decorative water features, such as fountains	Drought Preparedness & Response Plan Section 11.2	Yes
III	Landscape - Prohibit all landscape irrigation	Drought Preparedness & Response Plan Section 11.3	Yes
III	Water Features - Restrict water use for decorative water features, such as fountains	Drought Preparedness & Response Plan Section 11.3	Yes
III	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Drought Preparedness & Response Plan Section 11.3	Yes
III	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Drought Preparedness & Response Plan Section 11.3	Yes
III	Other	Drought Preparedness & Response Plan Section 11.3	Yes
NOTES: Per Ceres Municipal Code and Corresponding Ordinances.			

8.3 PENALTIES, CHARGES, OTHER ENFORCEMENT OF PROHIBITIONS

Any person committing any act which constitutes the wasting of water will be served a "Notice of Acts Constituting Water Wasting". This notice will serve as a first warning, and will:

1. Identify the date, time, and circumstances of the violation.
2. State the amount of the potential penalty for water wasting.
3. Advise the customer of his or her appeal rights.

If a second violation occurs within one year of the first warning, a penalty of $20 will be added to the customer's utility account. A third violation that occurs within one (1) year of the warning violation will result in an additional penalty of $100. A penalty of $250 will be assessed to the utility customer's account for a fourth violation. Each subsequent violation within one year after being served with a Notice of Acts Constituting Water Wasting will have a $500 penalty assessed to the utility customer's account. Failure by the customer to pay the penalty imposed will be grounds for disconnection of utility service until compliance is obtained. Any person issued a "Notice of Acts Constituting Water Wasting" has the right to appeal to the City's Administrative Hearing Officer, as described by Ceres Municipal Code 13.04.130 Section A-5.

8.4 CONSUMPTION REDUCTION METHODS

Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that will reduce water use, are appropriate for the service area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply. California Water Code Section 10632 (a)(5) requires the water supplier to provide consumption reduction methods in the most restrictive stages of a water shortage. Water consumption reduction methods used by the City are listed in Table 8-3 (DWR Table 8-3).

Table 8-3. Retail Only: Stages of WSCP – Consumption Reduction Methods (DWR Table 8-3)

Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference *(optional)*
All Stages	Expand Public Information Campaign	Drought Preparedness & Response Plan Section 12.1.2, 12.2.2, 12.3.2
All Stages	Offer Water Use Surveys	Drought Preparedness & Response Plan Section 13.2
All Stages	Provide Rebates on Plumbing Fixtures and Devices	Drought Preparedness & Response Plan Section 14
All Stages	Provide Rebates for Landscape Irrigation Efficiency	Drought Preparedness & Response Plan Section 14
All Stages	Provide Rebates for Turf Replacement	Drought Preparedness & Response Plan Section 14
All Stages	Increase Water Waste Patrols	
II	Decrease Line Flushing	
II	Implement or Modify Drought Rate Structure or Surcharge	Resolution No. 2015-64
NOTES:		

8.5 DETERMINING WATER SHORTAGE REDUCTIONS

California Water Code Section 10632 (a)(9) requires the water supplier to develop a mechanism for determining actual reductions in water use in the course of carrying out the urban water supply shortage contingency analysis.

The City completed water meter installation on all accounts in 2011 and the effectiveness of the City's water conservation program is based on metered water use data. Monitoring involves determining the per capita water use for residential users and the water use per account for non-residential customer categories.

The City determines if water customers are achieving the required demand reductions by comparing 2013 consumption, per Executive Order B-29-15.

8.6 REVENUE AND EXPENDITURE IMPACTS

Section 10632 (7) of the California Water Code Section requires an analysis of the impacts of each of the actions taken for conservation and water restriction on the revenues and expenditures of the water supplier.

On January 28, 2013, the City approved Resolution No. 2013-07 (Appendix F), amending the City's water rate schedule which establishes a rate schedule through June 2018 which includes a service charge and capacity charge. This structure attempts to more accurately charge customers for the true cost of delivered potable water. The rate structure is such that the majority of the City's water revenue is generated from hard costs (cost per connection – i.e., capacity and customer charges), and not volumetric usage (i.e., commodity charges), which means the City's revenues are not highly dependent on the volume of water their customers use. Billing customers under this new rate structure has helped mitigate lost revenue from reduced water deliveries during the present drought. The City estimates that the impact from the current drought has had less than a 1% drop in revenue. This revenue reduction was sufficiently absorbed through a corresponding short term reduction in Operation and Maintenance (O&M) costs, and deferred Capitol Improvement Project.

8.7 RESOLUTION OR ORDINANCE

As previously stated, the City Council approved The City's Drought Preparedness Water Rationing Stages Resolution No. 2014-27 and 13.04.130 of the Ceres Municipal Code (Appendix F).

8.8 CATASTROPHIC SUPPLY INTERRUPTION

Section 10632 (3) of the California Water Code requires actions to be undertaken by the water supplier to prepare for and implement during a catastrophic interruption of water supplies.

8.8.1 Water Emergency Disaster Response Plan

The City has a Water Emergency / Disaster Response Plan (Appendix G), with a stated objective to "maintain a minimum service level and mitigate the public health risks from any drinking water contamination that may occur during a disaster or other emergency event." The plan contains the following sections:

- Designated Responsible Personnel
- Water System Information
- Emergency Operations Center
- Emergency Response Procedures

The City also has seven emergency generators located at seven different wells, enough to provide water for firefighting and sanitation purposes. Based on the 2015 pump efficiency assessment the City's capacity is 10,183 gallons per minute with 6,100 gallons per minute available during a power outage or 60% of capacity.

8.8.2 Emergency Exchanges with Other Agencies

As stated previously, the City does not yet maintain any treated water interties with other agencies. However, once the Regional Surface Water Supply Project is operational, the City will have access to surface water from the Tuolumne River. The facilities of the Regional Surface Water Supply Project may supply emergency water to maintain normal distribution during a catastrophic supply interruption. Alternatively, if the catastrophic supply interruption is related to the surface water supply, the City will use the existing groundwater wells to provide sufficient water for health, sanitation, and fire protection for the duration of the emergency.

8.9 MINIMUM SUPPLY NEXT THREE YEARS

As an UWMP requirement, all water agencies are required to provide an estimate of the minimum water supply available during each of the next three water years, as shown in Table 8-4 (DWR Table 8-4). The supplies shown in the table are the sum of all the City's supplies expected to be available in the next three years if drought conditions persist (i.e., assuming hydrologic conditions would be similar to historic multiple dry year periods).

Table 8-4. Retail: Minimum Supply Next Three Years (DWR Table 8-4)

	2016	2017	2018
Available Water Supply	2,125	2,145	2,166
NOTES: Volumes are in MG.			

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Chapter 9. Demand Management Measures

CHAPTER 9
Demand Management Measures

This chapter describes the City's historical and existing water conservation program, status of implementation of Demand Management Measures (DMMs), and projected future conservation implementation. DMMs are mechanisms a water supplier implements to increase water conservation. The California Water Code (CWC) requires that UWMPs include a comprehensive description of historical, current, and projected water conservation programs.

CWC 10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

> *(1) (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.*

In previous UWMPs, a substantial amount of data was required to document a water supplier's progress in implementing 14 specific DMMs. In 2014, Assembly Bill 2067 simplified, clarified, and updated reporting requirements for DMMs. Starting with this 2015 UWMP, focus has turned away from detailed descriptions of each of the fourteen DMMs and has turned to key water conservation measures that are being implemented to achieve compliance with SB X7-7. For retail agencies, the number of DMMs has been reduced from fourteen to six (plus an "other" category).

9.1 WATER CONSERVATION PROGRAM OVERVIEW

The City actively promotes water conservation through customer education and other DMMs described in the following sections. The City educates customers through outreach methods such as direct mail, web site alerts, messages on customer bills and school-based education programs that reinforce the need for customers and their families to take prompt action to reduce water use to conserve precious drinking water.

As described in this chapter, the City has an active and comprehensive conservation program that offers a full range of helpful programs for customers to reduce their water use.

9.2 DEMAND MANAGEMENT MEASURES

The 6 DMMs required for the 2015 UWMP include the following:

- Water waste prevention ordinances
- Metering
- Conservation pricing
- Public education and outreach
- Programs to assess and manage distribution system real loss
- Water conservation program coordination and staffing support

The goal of this chapter is to provide a comprehensive description of the water conservation programs that are currently implemented and those planned to be implemented in the future. For each DMM, the current program is described, followed by a description of how the DMM was implemented over the previous five years and any future implementation plans.

9.2.1 Water Waster Prevention Ordinances

Title 13 of the water and sewer section 13.04.130 of the Ceres Municipal Code (Appendix F) contains a water wasting prohibition section that prohibits the wasteful use of water. This section prohibits specific water wasting appurtenances (such as "once-through" cooling systems), general water waste, and requires proper maintenance of water pipes and fixtures to prevent leaks. This ordinance is in line with the goals of the California Urban Water Conservation Council (CUWCC) MOU.

Table 9-1 lists documented water waste violations, warnings and excessive consumption notices recorded by the City from 2011 through 2015. On June 8, 2015 Resolution No. 2015-64 (Appendix F) was approved to amend section 13.04.130 of the Ceres Municipal Code to add fines for exceeding water usage targets. As shown, the number of recorded violations since 2011 is substantial, with a dramatic increase for 2015. As expected, this increase in recorded violations is reflected in a corresponding decrease of per capita water use: from 160.47 gallons per capita per day in 2011 to 122.71 gallons per capita per day in 2015 – a decline of 15.9 percent.

Table 9-1 Documented Water Waste Violations (a)

	2011	2012	2013	2014	2015
Number of Violations	556	122	292	150	259
Number of Warnings	907	205	3981	924	1,351
Number of Excess Consumption Fines					6,784
Number of Excess Consumption Warnings					2,117
(a) Written warning and notices to customers. Excess Consumption notices approved in 2015.					

For dry year conditions and other water supply shortages, the City has a Drought Preparedness and Response Plan (Appendix G: Section 18) that includes specific water use restrictions.

Implementation of this DMM will continue to help the City achieve its water use targets by minimizing the nonessential uses of water in order to increase availability for human consumption, sanitation, and fire protection.

9.2.2 Metering

The City commenced meter-based billing for the vast majority of its water accounts on January 1, 2011. In conjunction with a thorough public education campaign, the move to meter-based billing has resulted in a significant decrease in water consumption. The installation of meters appears to have significantly modified customer behavior and is largely responsible for the 24 percent reduction in total City-wide water use from 2011 to 2015. The per capita water use, likewise, declined by 26.6 percent City-wide between 2011 and 2015 as customers began receiving and responding to their commodity-based monthly water bills.

In addition to motivating water use behavior change in rate-payers, the City's metering program also provides detailed usage information that has helped customers use water more efficiently. For example, the Automated Metering Infrastructure (AMI) systems installed throughout the City provides near real-time water usage information, empowering the customers with large irrigated landscapes to maximize the efficiency of its watering schedule.

Implementation of this DMM will continue to help the City achieve its water use targets by providing accurate water use information to the customer and the City.

9.2.3 Conservation Pricing

The City of Ceres conducted a water rate study in November 2012. Based on that study, the City adopted changes to the Water and Sewer Service fee rate structure on January 28, 2013 that went into effect July 1, 2013. The rate increases annually every July 1st and continues until 2018 (Appendix H). The current pricing structure is comprised of two components. The first is the commodity charge, which is the cost of the water supply. Customers are charged per 1,000 gallons of water based on the account type. The City also has a two tier conservation pricing structure that is set as follows; Tier 1: 0 to 75,000 gallons per month and Tier 2: usage over 75,000 gallons in a month. The account is then charged per thousand gallons by the tier rate. The second component of the pricing structure is the capacity charge. This charge accounts for the cost of the meter, operation and maintenance, as well as other facility costs. This charge is based on the meter size.

Since the implementation of these rates, water production has declined approximately 24 percent. Overall, with the installation of water meters and the conversion of all customers to meter-based billing, and the watering restrictions currently in place there has been approximately a 48 percent reduction in water use from 2008 to 2015.

Implementation of this DMM will continue to help the City achieve its water use targets by ensuring water customers pay the true cost of water. Implementation of this DMM will also continue to help adequately fund water system operations and maintenance, including capital repair and replacement programs, and water conservation programs.

9.2.4 Public Education and Outreach

The City has an active public information and outreach program. This program consists of distributing information to the public through a variety of methods, such as utility billing publication inserts, press releases via radio and newspaper, school curriculum, educational flyers, commercials on television, and water conservation tips and videos on the City's webpage.

Since 2008, the City has implemented an aggressive and prominent water conservation program. The program is broad, but focuses specifically on conservation education. Program components include water use efficiency and conservation, storm water pollution prevention, recycling, composting, and sanitary sewer overflow prevention. The educational activities related to water conservation over the past eight years include, but are not limited to:

- Website information
- Utility bill inserts
- Press releases
- Print media campaigns / columns
- Local cable TV public information
- Booths at fairs / exhibitions
- Schools / Career Day
- Presentation to local service organizations and similar groups

The City's primary school-age public education campaign is available year around, which engages students in activities that teach the importance of environmentally-responsible behavior. Through a partnership of City staff, teachers, administrators, community organizations, and volunteers, the City sponsors an annual recycling poster contest where students learn about conservation and pollution prevention strategies such as recycling, composting, water conservation and waste reduction. During the 2014-2015 school year city staff conduct periodic classroom presentations to 629 students on water conservation and other environmental issues, as well as provide student tours of the City's wastewater treatment plant.

Implementation of this DMM will continue to help the City achieve its water use targets by educating water users about the importance of improving water use efficiency, and avoiding water waste.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

A water audit is a method of accounting water use throughout a water system in order to quantify unaccounted-for water. Unaccounted-for water is the difference between metered production and metered usage on a system-wide basis. With the implementation of meter-based billing for all water accounts, the City is better able to track water losses and unaccounted water use. The City uses AWWA's software to complete annual Water Audits and Balance Analysis. A copy of the City's most recent AWWA audit can be found in Appendix I.

In addition to the above AWWA water audits, the City's loss prevention program involves leak detection and repair, focusing primarily on areas with a high probability for leakage. Due to the flat nature of the San Joaquin Valley and the shallow depth of the City's water mains, water leaks are detected fairly easily. Utility staff monitor for water leaks as part of their daily operations, and respond to calls from customers concerned about potential leaks. Although the City does not perform "formal" pipeline inspections at regular intervals, these "spot check" inspections help

contribute to approximately 57 leak repairs per year. Implementation of this DMM will continue to help the City achieve its water use targets by identifying sources of water loss quickly so repairs can be made and losses minimized.

9.2.6 Water Conservation Program Coordination and Staffing Support

In line with the CUWCC's MOU, the City has designated staff to actively develop, promote, enforce, and maintain water conservation programs. Currently, one full-time employee manages a portion of their time to serve the duties of a Water Conservation Coordinator. The water conservation coordinator directs two full-time employees and four part-time employees. These employees are responsible for responding to water complaints, monitoring water waste, issuing warnings and violations, and checking for excess landscape water use.

The effectiveness of this DMM is evaluated in conjunction with the success of the City's water conservation efforts as a whole. As the City grows and water resources become more limited and expensive, the water conservation programs will continue grow and promote the importance of water conservation.

Implementation of this DMM will continue to help the City achieve its water use targets by making implementation of the City's water conservation program a top priority.

9.3 OTHER DEMAND MANAGEMENT MEASURES

In addition to the six DMMs described above, the City also implements the following programs:

- Residential Water Survey Program
- Distribution of Free Water Conservation Devices (showerheads, aerators, etc.)
- WaterSense Toilet Rebate Program
- High-Efficiency Washing Machine Rebate Program
- Smart Irrigation Controller Rebate Program
- Energy Efficient Dishwasher Rebate Program
- Turf Replacement Rebate Program
- Water Meter Portal

These programs are described below.

9.3.1 Residential Water Survey Program

The City began implementation of its residential water survey program in 2015. The program was developed by City staff to allow for an increased water allotment for usage targets and to gauge how efficient residents are with their water use. The survey allows city staff to make modification to monthly targets due to number of residents in the home, square footage and special circumstances such as a pool on property. By performing the audit, the customer is able to identify areas of potential improvement, as well as identify potential leaks. Free water saving devices (low-flow shower heads and faucet aerators) is provided to customers on site once the survey has been completed.

9.3.2 Distribution of Free Water Conservation Devices

The City provides the following free water conservation devices to Ceres residents:

- 1.25 GPM Showerhead
- 1.0 GPM Aerator
- Toilet Tank Bank
- Shower Timer
- Toilet Leak Detector Dye Tablets
- Water Efficient Hose Nozzle

9.3.3 WaterSense Toilet Rebate Program

The City offers a WaterSense toilet rebate program (Appendix F) which provides financial incentives to qualifying customers who install ultra-low flush toilets in their homes. This program provides a $75 rebate for city customers to replace existing toilets with high efficiency models that meet the EPA's WaterSense specifications and utilize 1.6 gpf or less.

9.3.4 High-Efficiency Washing Machine Rebate Program

The City offers a high-efficiency washing machine rebate program (Appendix F) which provides financial incentives to qualifying customers who install high-efficiency washing machines in their homes. Rebates for the purchase of high-efficiency clothes washers are available for $75 per washer. In addition to the City's rebate, the City's main electrical utility (TID) currently offers a $35 rebate for customers who purchase a high-efficiency clothes washer (Energy Star compliant). These rebates can be combined for additional savings.

9.3.5 Smart Irrigation Controller Rebate Program

The City offers a smart irrigation controller rebate program (Appendix F) which provides financial incentives to qualifying customers who install a water sense labeled smart irrigation controller in their homes. This program provides a $50 rebate for city customers to replace existing controllers with models that that meet the EPA's WaterSense specifications and creates or modifies irrigation schedules based on evapotranspiration (ET) principles.

9.3.6 Energy Efficient Dishwasher Rebate Program

The City offers an energy efficient dishwasher rebate program (Appendix F) which provides financial incentives to qualifying customers who install an energy star labeled dishwasher in their homes. This program provides a $75 rebate for city customers to replace an existing dish washer machines with models that that meet the EPA's specifications and utilize 4.25 gallons per cycle of water for standard models and 3.50 gallons per cycle for compact models.

9.3.7 Turf Replacement Rebate Program

The City offers a turf replacement rebate program (Appendix F) which provides financial incentives to qualifying customers who install drought tolerant landscapes at their homes. This program provides $1.00 for every square feet of grass removed for residents and non-residential accounts. The rebate caps at 500 square feet for residential accounts and 1,000 square feet for non-residential accounts.

9.3.8 The Water Meter Portal Program

The City has developed a free Water Meter Portal that allows our residents to monitor their own water usage, receive leak notification and view monthly water targets. The portal is an updated daily and allows our residents the ability to view their data on a daily, weekly, monthly and annual format. The portal will also generate a leak notification to the residents email and or send a text message. Other features the portal offers are usage reports and alerts that are sent weekly to inform the resident of their month to date water consumption and allow residents to make modification to their water schedule if needed. The Ceres Water Meter Portal can be found at http://meterportal.ci.ceres.ca.us

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Chapter 10. UWMP Adoption, Submittal, and Implementation

CHAPTER 10
UWMP Adoption, Submittal, and Implementation

This chapter provides information regarding the notification, public hearing and adoption of the UWMP.

10.1 INCLUSION OF ALL 2015 DATA

Since 2015 is the first compliance year for SB X7-7, the 2015 UWMPs must contain data through the end of 2015. If the water supplier bases its accounting on a calendar year, the data must be through the end of the 2015 calendar year (December 2015).

As indicated in Chapter 2, the City uses a calendar year for water supply and demand accounting, and therefore this 2015 UWMP includes data through December 2015.

10.2 NOTICE OF PUBLIC HEARING

The City provided 60-day notice of the preparation of its 2015 UWMP, and notice of the 2015 UWMP Public Hearing to the City and County as listed in Table 10-1 (DWR Table 10-1).

Table 10-1. Retail: Notification to Cities and Counties (DWR Table 10-1)

City Name	60 Day Notice	Notice of Public Hearing
City of Ceres	☑	☑
Stanislaus County Public Works Department	☑	☑

Other agencies notified include the following:

- City of Turlock
- City of Hughson
- City of Modesto
- Denair Community Services District
- East Stanislaus Regional Water Management Partnership
- Eastside Water District
- Keyes Community Services District
- Merced County Public Works Department
- Merced Irrigation District
- Modesto Irrigation District
- Stanislaus Regional Water Authority
- Turlock Groundwater Basin Association
- Turlock Irrigation District

10.2.1 Notice to the Public

Public hearing notifications for adopting the UWMP were published in the local newspaper Ceres Courier and the Modesto Bee since the City serves a portion of Modesto residents. Copies of the published Notice of Public Hearing are included in Appendix D.

10.3 PUBLIC HEARING AND ADOPTION

The City has encouraged community and public interest involvement in the UWMP update through the use of mailings, public meetings, and web-based communication. Copies of the City's outreach efforts are included in Appendix D.

The public hearings provided an opportunity for all City water users and the general public to become familiar with the UWMP and ask questions about its water supply, in addition to the City's continuing plans for providing a reliable, safe, high-quality water supply. Hard copies of the draft UWMP were made available for public inspection at the City's Public Works Department and the City's Clerk's Office during normal business hours, the Ceres Public Library, with an electronic version placed on the City's website.

10.3.1 Adoption

This UWMP was adopted by the City Council on June 27, 2016. A copy of the adopted resolution is provided in Appendix J.

10.4 UWMP SUBMITTAL

A copy of this 2015 UWMP will be submitted to DWR by July 1, 2016. The adopted 2015 UWMP will be submitted electronically to DWR using the WUEdata submittal tool. A hardcopy of the adopted 2015 UWMP will also be submitted to the Ceres Public Library.

No later than 30 days after adoption, a copy of the adopted 2015 UWMP, including the Emergency Water Shortage Plan, will be provided to the cities and counties to which the City provides water.

10.5 PUBLIC AVAILABILITY

Upon submittal to DWR, hard copies of this UWMP will be available for public review at the City's Public Works Department during normal business hours and at the Ceres Public Library. An electronic copy of this UWMP will also be available for review and download on the City's website: http://www.ci.ceres.ca.us/213.html

10.6 UWMP IMPLEMENTATION

This UWMP will be the source document for any Senate Bill 610 Water Supply Assessments or Senate Bill 221 Water Supply Verifications required for any proposed projects between 2016 and 2020 that are subject to the CEQA and would demand an amount of water equivalent or greater than the amount of water required by a 500 dwelling unit project. This UWMP will also be used for regulatory compliance and provide guidance on development of new local supplies and implementation of water conservation programs and recycled water expansion to meet the requirements of the Act.

10.7 AMENDING AN ADOPTED UWMP

If the City amends its 2015 UWMP, copies of amendments or changes to the plans will be submitted to DWR, the Ceres Public Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.