DRAFT

CITY OF WATSONVILLE 2020 URBAN WATER MANAGEMENT PLAN

July 2021

Harris & Associates

TABLE OF CONTENTS

Figures

Tables

Appendices

s

This page intentionally left blank.

ES EXECUTIVE SUMMARY

The City of Watsonville (City) 2020 Urban Water Management Plan (UWMP) is an update to its 2015 UWMP. The State Legislature has passed significant additions to the UWMP since 2015. At its core, however, the purpose of the UWMP has not changed. It gathers, characterizes, and synthesizes water-related information from numerous sources to assess and project the City's water reliability well into the future. The City's 2020 UWMP includes water reliability forecasts through the year 2045. It also acts as a guide to maintain efficient use of urban water supplies, promote conservation programs and policies, and proactively plan and update the City's strategies to address potential water shortages and drought conditions.

HIGHLIGHTS

- The City met its 2020 target water use. Each resident used an average of 87 gallons each day.
- Per person water use is projected to remain flat. Total residential water use is projected to increase (without further conservation) due to population growth.
- The City's distribution system is the system of underground pipes, pumps, and components that deliver drinking water to residents, businesses, schools and other government facilities, and agricultural users. Water losses in the distribution system averaged 8 percent. This falls below the statewide average of about 10 percent.
- Conservation measures and messaging were implemented during the last five-year drought. The City was able to meet statewide water reduction targets. With adequate conservation by the community, the City's water supply is expected to remain stable.

The UWMP is organized as follows:

- Chapter 1 includes water planning fundamentals, legislative underpinnings for the UWMP Act, and an overview of coordination with other City-wide planning efforts. It also lists the legislated updates from the 2015 UWMP.
- Chapter 2 includes the legislative basis that requires the City to prepare an UWMP, as well as organizational details required by the California Department of Water Resources.
- The Water Service Area (WSA) includes all water meters that are served by the City, some of which are outside City limits. Chapter 3 provides an overview of the WSA. The overview includes population and demographics, land use, and a discussion of climate change and potential climate change impacts.
- Chapter 4 provides current and projected water demand (water use).
- Chapter 5 reviews the City's compliance with meeting California state law SB X7-7 that requires the state to reduce urban water consumption by 20 percent by the year 2020.
- Chapter 6 discusses water supply – the City's sources of water and the state of these sources.
- Chapter 7 discusses water quality, water reliability, and supply and demand in potential drought periods.
- Chapter 8 provides an overview of the Water Shortage Contingency Plan, which is provided in full in Appendix 8-1.

- Chapter 9 includes a discussion of past and future conservation measures and their effectiveness.
- Chapter 10 summarizes the public hearing, City Council adoption, and submittal process for this UWMP.

The UWMP includes numerous tables that are submitted to the California Department of Water Resources (DWR). Abbreviated versions of required tables are included in the body of the plan. The full tables are included in Appendix 10-4.

ES.1 TWENTY PERCENT REDUCTION IN WATER USE

California Senate Bill X7-7 was enacted in 2009. It required a reduction in per person water use of 20 percent by 2020. The City's 2020 target was 117 gallons per person per day. This means that each person should use no more than 117 gallons each day. The City met its target water use. Residents used an average of 87 gallons each day. It is important for the City's residents to maintain this level of water usage.

ES.2 CURRENT AND PROJECTED WATER USE

Table ES-1 depicts water use in the City's WSA. Data for the year 2020 data is actual water use. Data for years 2025–2045 is projected water use.

"Single-Family" and "Multi-Family" are residential homes. "Single-Family" means a residence that houses one family. "Multi-Family" refers to duplexes, apartments, and condominiums. The increase in projected residential water is primarily due to projected growth in population. Per-person water use is projected to remain at 87 gallons per day.

The Commercial and Industrial categories refer to businesses. Landscaping mainly consists of parks and schools.

Agricultural irrigation has experienced increasing usage over time. That trend is projected to continue.

The "Losses" row refers to water losses in the distribution system. The distribution system is the system of underground pipes, pumps, and components that deliver drinking water to the City. Distribution system water losses for 2016–2020 averaged 478 AFY, or eight percent of water produced. The eight percent figure falls below the statewide average of about 10 percent and is expected to meet State performance standards. Water losses are projected to remain steady at 478 AFY over the planning period.

TABLE ES-1: CURRENT AND PROJECTED WATER USE

USE TYPE	CURRENT AND PROJECTED WATER USE (AFY)					
	2020	2025	2030	2035	2040	2045
Single-Family	3,329	3,267	3,377	3,491	3,565	3,623
Multi-Family	839	854	883	913	932	947
Commercial	1,136	1,214	1,220	1,226	1,232	1,238
Industrial	535	536	536	536	536	536
Landscape	471	475	475	475	475	475
Agricultural Irrigation	729	840	891	942	993	1,045
Other	43	43	43	43	43	43
Losses	20	478	478	478	478	478
TOTAL	7,102	7,707	7,903	8,104	8,255	8,384

ES.3 CURRENT AND PROJECTED WATER SUPPLY

The City's source of water (water supply) is groundwater and surface water. The surface water is the Corralitos and Browns Creeks. The City is not always able to withdraw water from the creeks. Fortunately, the City can rely on groundwater for all of its water supply.

The City pumps groundwater from the Pajaro Valley Groundwater Subbasin (Subbasin). City use accounts for about 14 percent of the total annual pumping from the Subbasin.

The Subbasin is designated as "critically overdrafted." Groundwater overdraft occurs when groundwater use exceeds the amount of recharge into an aquifer, which leads to a decline in groundwater levels. In other words, excessive withdrawals from the Subbasin over the decades have resulted in reduced groundwater levels. This, in turn, has allowed seawater intrusion. Seawater intrusion into the groundwater increases the salinity of the groundwater.

Groundwater resources in the Subbasin have been managed by the Pajaro Valley Water Management Agency (PV Water) since the agency's formation in 1984. PV Water has completed multiple water supply projects to help reduce overdraft, lessen seawater intrusion, and improve and protect water quality within the entire basin. The City works collaboratively with PV Water on a number of projects. In particular, the City and PV Water jointly developed the Watsonville Area Recycled Water Treatment Facility (RWF). The City operates the RWF, and PV Water distributes the recycled water for agricultural uses.

During droughts, groundwater levels in the Subbasin typically decrease. This can be offset by reduced water usage. With adequate conservation measures implemented during a drought, and on-going and new projects by PV Water, groundwater levels in the Subbasin, and thus the City's available water supply, are expected to remain stable.

ES.4 DROUGHT RISK ASSESSMENT

A drought risk assessment was developed to consider the impact of a five-year drought over the next five years (2021–2025). The assessment reviewed changes in water demand (water use) from the three-year drought of 2007–2009 and the five-year drought from 2012–2016.

Water demand increased an average of 9.3 percent in the first year of the drought, 14.1 percent in the second year, and 1.7 percent in the third year. Water demand decreased 8.4 percent and 15.4 percent in years four and five of the five-year drought.

Due to the current drought that the region is experiencing, and the possibility that droughts will intensify, the City will need to redouble its efforts to promote conservation measures to ensure they are adopted early and are widespread in the community.

ES.5 STRATEGIES AND CHALLENGES FOR MANAGING RELIABILITY RISKS

The City's water demand management strategies have been highly successful in reducing overall water usage. These strategies include:

- Water efficiency and waste prevention ordinances
- Meter replacement and upgrades
- Conservation pricing
- Public education and outreach, including increased residential usage of Energy Star appliances and water efficiency devices for showerheads, hose nozzles, and faucet aerators
- Programs to assess and manage distribution system losses
- Water conservation program coordination and staffing support

To manage water usage during drought, the City can rely on its updated Water Shortage Contingency Plan (WSCP). This plan provides the process for completing the new Annual Water Shortage Assessment Report on water demand and supply that must be submitted to the California Department of Water Resources starting in 2022.

The WSP also provides Shortage Response Actions to take in response to six standardized shortage levels.

1 INTRODUCTION AND OVERVIEW

The UWMP is the legal and technical water management foundation for water suppliers throughout California. Originally enacted in 1983, the Urban Water Management Planning Act (Act) not only ensures that urban water suppliers are proactively reviewing and managing water reliability, but it also requires and provides the data for the California Department of Water Resources (DWR) reporting to the California State Legislature on the status of water supply planning in California. The UWMP gathers, characterizes, and synthesizes water-related information from numerous sources into a plan with local, regional, and statewide utility. The Act has undergone significant changes since its original inception and now encompasses California Water Code (CWC) §10610–10657.[1]

The City of Watsonville (City) 2020 UWMP revises its 2015 UWMP to comply with the CWC. It provides information on present and future water demands and supplies in order to assess the City's water resource reliability over the next 25 years. This UWMP also acts as a guide to maintain efficient use of urban water supplies, promote conservation programs and policies, and proactively plan and update the City's strategies to address potential water shortages and drought conditions.

The UWMP addresses these water-planning fundamentals:

- Preparing a detailed look at current and future water use, including assessing baseline data and examining other long-term planning documents for the region.
- Analyzing potable and non-potable water supplies, including reviewing water rights and contracts, ascertaining restrictions on water availability under certain regulatory and hydrological conditions, and assessing seismic risk to various water system facilities.
- Reviewing the range of potential impacts of climate change on water demand and supply.
- Analyzing water supply reliability by integrating the water use analyses with the water supply analyses to provide a water service reliability picture under normal conditions, single dry-year conditions, and five consecutive dry years through the year 2045.
- Preparing a Drought Risk Assessment by including integrated water supplies and projected water use in a hypothetical five-year drought condition.
- Developing a Water Shortage Contingency Plan that specifies opportunities to reduce demand and augment supplies under numerous water shortage conditions.

[1] California Water Code §10610–10657 (Accessed 2/5/2021).

1.1 LEGISLATIVE UNDERPINNING FOR URBAN WATER MANAGEMENT PLANS

In addressing urban water management issues, the California Legislature has made a number of significant declarations (CWC §10610.2–10610.4), as follows:

- The waters of the state are a limited and renewable resource subject to ever-increasing demands.
- Conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
- A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.
- As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.
- Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
- Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins' water quality objectives and promoting beneficial use of recycled water.
- Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
- Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
- The quality of source supplies can have a significant impact on water management strategies and supply reliability.

The Legislature finds and declares that it is the policy of the state as follows:

- The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
- The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
- Urban water suppliers shall be required to develop water management plans to achieve the efficient use of available supplies and strengthen local drought planning.

1.2 NEW REQUIREMENTS

In 2015 and again in 2020, DWR published an extensive Urban Water Management Plan Guidebook. Since 2015, the California Legislature has passed a number of additional requirements for the 2020 UWMP, which are included in the 2020 UWMP Guidebook. Highlights of the new requirements include:

- **Five Consecutive Dry-Year Water Reliability Assessment** The Legislature modified the dry-year water reliability planning from a "multiyear" time period to a "drought lasting five consecutive water years" designation. This statutory change requires a Supplier to analyze the reliability of its water supplies to meet its water use over an extended drought period.
- **Drought Risk Assessment** The Drought Risk Assessment (DRA) requires a Supplier to assess water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.
- **Seismic Risk** Suppliers must address seismic risk to their water infrastructure.
- **Water Shortage Contingency Plan Updates** Watsonville's 2015 UWMP contained a Water Shortage Contingency Plan; however, 2018 legislative changes require modifications/enhancements to this Plan.
- **Groundwater Supplies Coordination** 2020 UWMPs should be consistent with Groundwater Sustainability Plans in areas where those plans have been completed by Groundwater Sustainability Agencies.
- **Lay Description** The Legislature included a new statutory requirement for Suppliers to include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks. This UWMP includes the lay description in the Executive Summary.

1.3 COORDINATION WITH OTHER PLANNING EFFORTS

Planning elements serve different purposes and do not always use the same data. However, coordination across planning efforts is considered essential to an effective and consistent planning process across the region. Development of the City's UWMP has been prepared in coordination with numerous planning elements, including the City of Watsonville's Final 2015–2023 Housing Element, 2020 Local Hazard Mitigation Plan, and on-going work on a Water Master Plan, as well as the 2014 Pajaro River Watershed Integrated Regional Water Management Plan and other important materials from the Pajaro Valley Water Management Agency (PV Water).

This page intentionally left blank.

2 PLAN PREPARATION

The Urban Water Management Planning Act requires that a description be provided of the process that was used for the preparation of the UWMP. This chapter provides the legal requirement to prepare this Plan, the option of regional planning, and the coordination and outreach related to this Plan. This chapter also includes report tables that are required by DWR.

2.1 BASIS FOR PREPARING A PLAN

The California Water Code (CWC) defines an "Urban Water Supplier" as a publicly or privately owned supplier of water for municipal purposes, either directly or indirectly, to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. The code further requires urban water suppliers to adopt an Urban Water Management Plan (UWMP) and update the Plan every five years.

The City first prepared an UWMP in 1995 and has updated it every five years. At year-end 2020, the City supplied water to over 14,884 active service connections, as summarized in Table 2-1, and thereby continues to qualify as an urban water supplier that is required to update its UWMP.

TABLE 2-1: PUBLIC WATER SYSTEM INFORMATION

PUBLIC WATER SYSTEM NUMBER	PUBLIC WATER SYSTEM NAME	NUMBER OF MUNICIPAL CONNECTIONS 2020	VOLUME OF WATER SUPPLIED 2020
CA4410011	City of Watsonville	14,884	7,102
	TOTAL	14,884	7,102

2.2 REGIONAL PLANNING

An urban water supplier may elect to submit an individual UWMP or may work with other entities to provide a regional plan. The City communicates regularly with related water supply stakeholders and provided notice of this UWMP effort, as discussed in Section 2.4 (Coordination and Outreach). For the purposes of this UWMP, the City reports solely on the City's water service area (WSA) and is not part of a regional alliance or Regional UWMP, as shown in Table 2-2. This individual UWMP addresses the requirements of the CWC.

TABLE 2-2: PLAN IDENTIFICATION

SELECT ONLY ONE	TYPE OF PLAN		NAME OF RUWMP OR REGIONAL ALLIANCE
☑	**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)**		

2.3 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

As shown in Table 2-3, this UWMP has been prepared using calendar year data and includes complete 2020 data, as required by the DWR guidelines. The units of measure reported are acre-feet (AF).

TABLE 2-3: SUPPLIER IDENTIFICATION

TYPE OF SUPPLIER (SELECT ONE OR BOTH)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
FISCAL OR CALENDAR YEAR (SELECT ONE)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
UNITS OF MEASURE USED IN UWMP (SELECT FROM DROP DOWN)	
Unit	AF

2.4 COORDINATION AND OUTREACH

The City submitted its draft plan to regional stakeholders and made the draft plan available to the public in hard copy form and electronic form per the requirements of the CWC (see Chapter 10 for additional detail).

The following regional stakeholders were notified on February 10, 2021, that the City was in the process of reviewing and updating its UWMP (Appendix 2-1):

- Pajaro Valley Water Management Agency
- Santa Cruz County
- Aromas Water District
- Community Foundation Santa Cruz County
- Pajaro/Sunny Mesa Community Services District

The City of Watsonville does not supply water to other cities or agencies.

The City does not purchase wholesale water and, thus, did not provide information to any wholesale water suppliers, as shown in Table 2-4.

TABLE 2-4: WATER SUPPLIER INFORMATION EXCHANGE

THE RETAIL SUPPLIER HAS INFORMED THE FOLLOWING WHOLESALE SUPPLIER(S) OF PROJECTED WATER USE IN ACCORDANCE WITH WATER CODE SECTION 10631.
Not Applicable

This page intentionally left blank.

3 SYSTEM DESCRIPTION

3.1 GENERAL DESCRIPTION

The City of Watsonville (City) is located along the Monterey Bay between the cities of Santa Cruz and Monterey in Santa Cruz County (Figure 3-1). The City lies in the heart of the Pajaro Valley, surrounded by prime agricultural land and wetlands. Water is an integral component throughout the region's environs. Five small lakes are located near the City's northern and eastern boundaries.

The City is bounded by Corralitos Creek to the north, Salsipuedes Creek to the east, and the Pajaro River to the south. The Pajaro River forms the boundary between the Santa Cruz and Monterey counties. Several small creeks and sloughs meander through the City and extend to the south and west of Highway 1, forming what is referred to as the Watsonville Slough System. Figure 3-2 shows the City's location, with the red inset box outlining City boundaries. The City's water service area (WSA) extends beyond City limits, as discussed in Section 3.2.

The water system originated in 1877 when water was piped from the Corralitos area to a reservoir on Whiskey Hill (now Freedom Reservoir on Freedom Boulevard). The water system served the small community of Watsonville, under the name of the Watsonville Water and Light Company, until the City acquired it in 1927. In 1931, a slow sand filtration plant, the Corralitos Filter Plant (CFP), was constructed in Corralitos to filter the raw water coming from the Corralitos and Browns creeks. By 1979, the water system had grown to represent its current state. It consisted of eight pressure zones, 10 wells, eight storage facilities, over 100 miles of pipeline, and the CFP.

3.2 SERVICE AREA

Today, the City's WSA is larger than the city limits, extending into the unincorporated areas of Santa Cruz County. As shown in Figure 3-3, the service area consists of nine hydraulic pressure zones, 14 wells, eight reservoirs and water storage facilities, nine booster stations, over 190 miles of pipelines, and the CFP. This regional water system serves a population of 65,231 customers.

FIGURE 3-1: WATSONVILLE LOCATION IN SANTA CRUZ COUNTY, CALIFORNIA

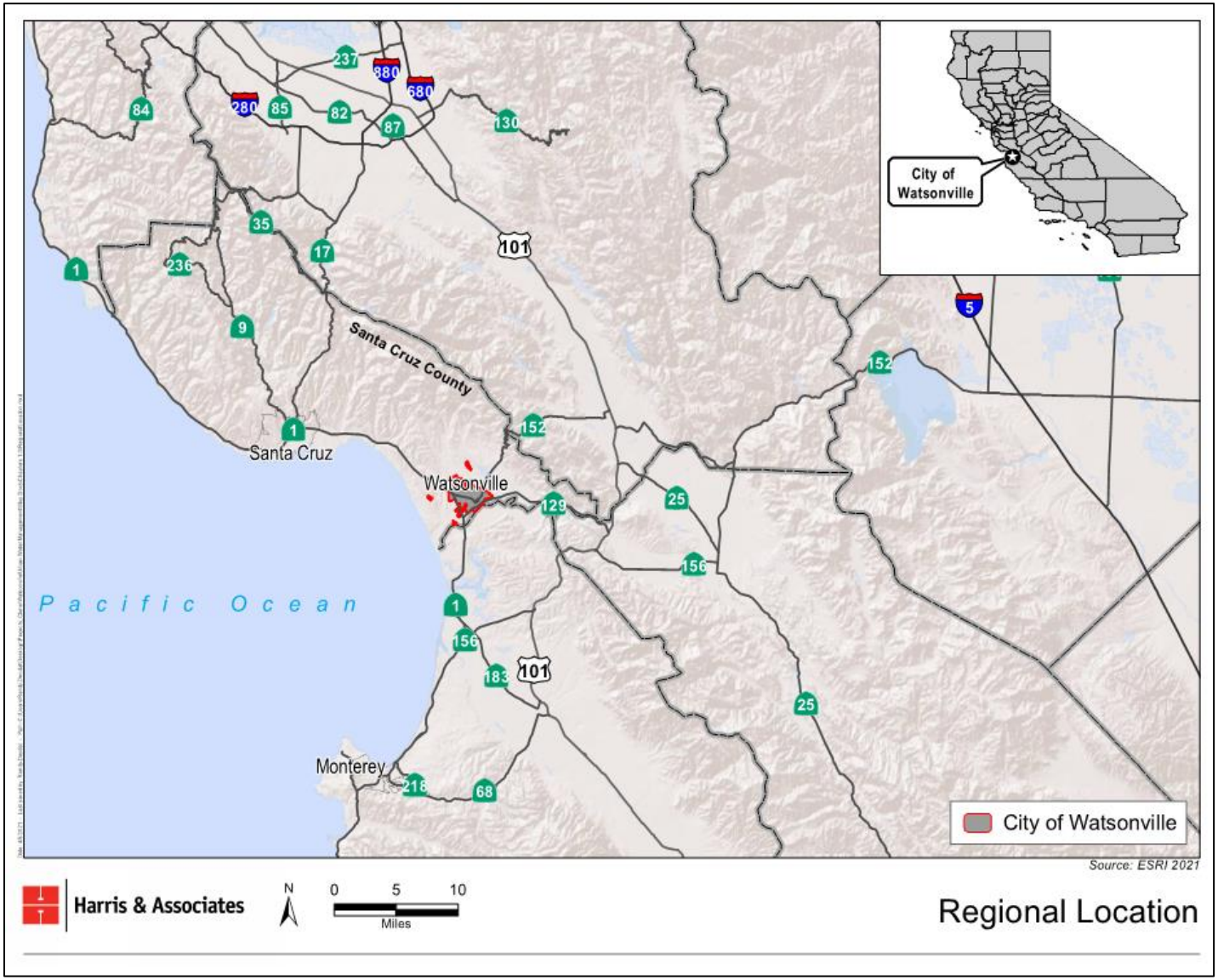


FIGURE 3-2: WATSONVILLE CITY LIMITS

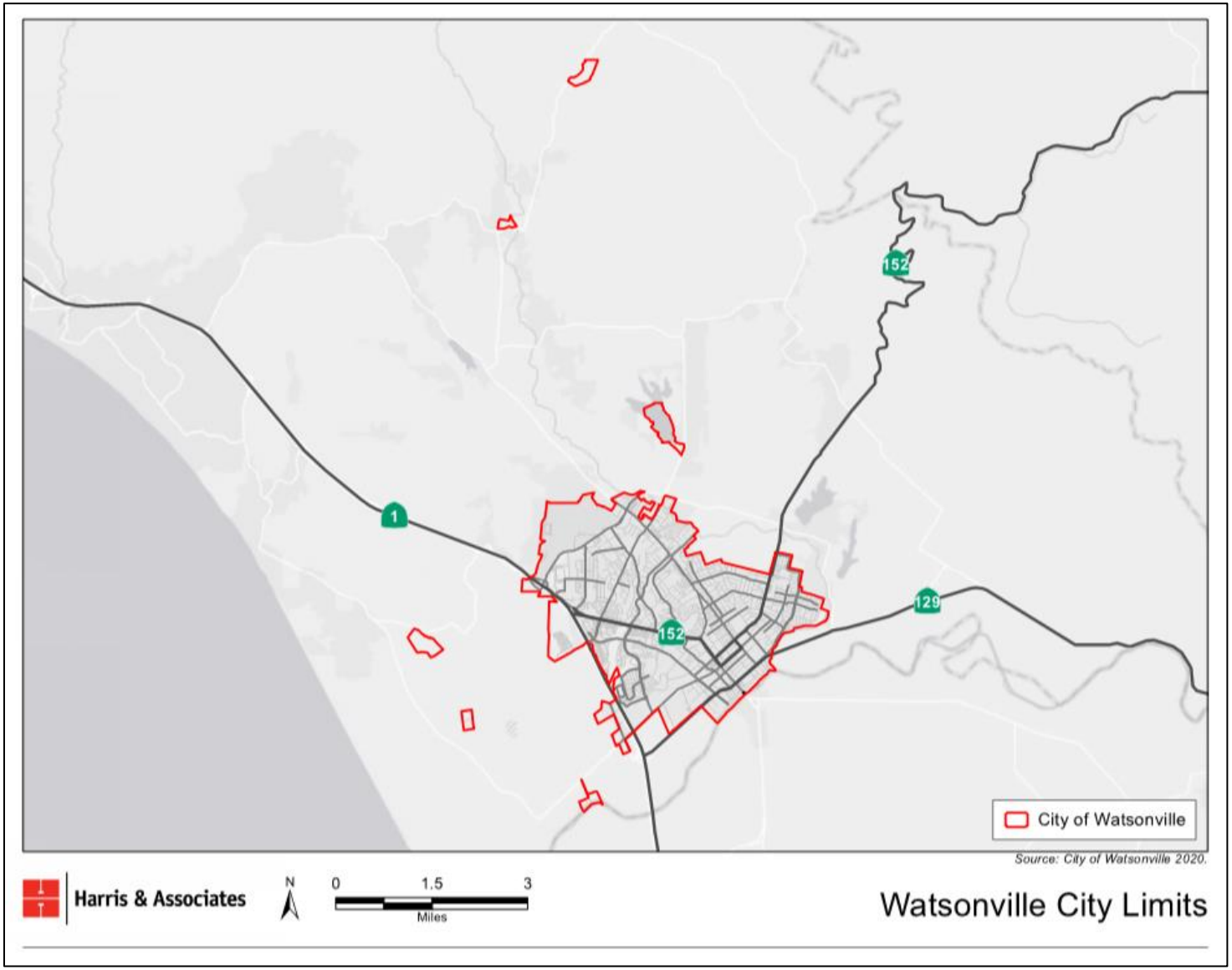
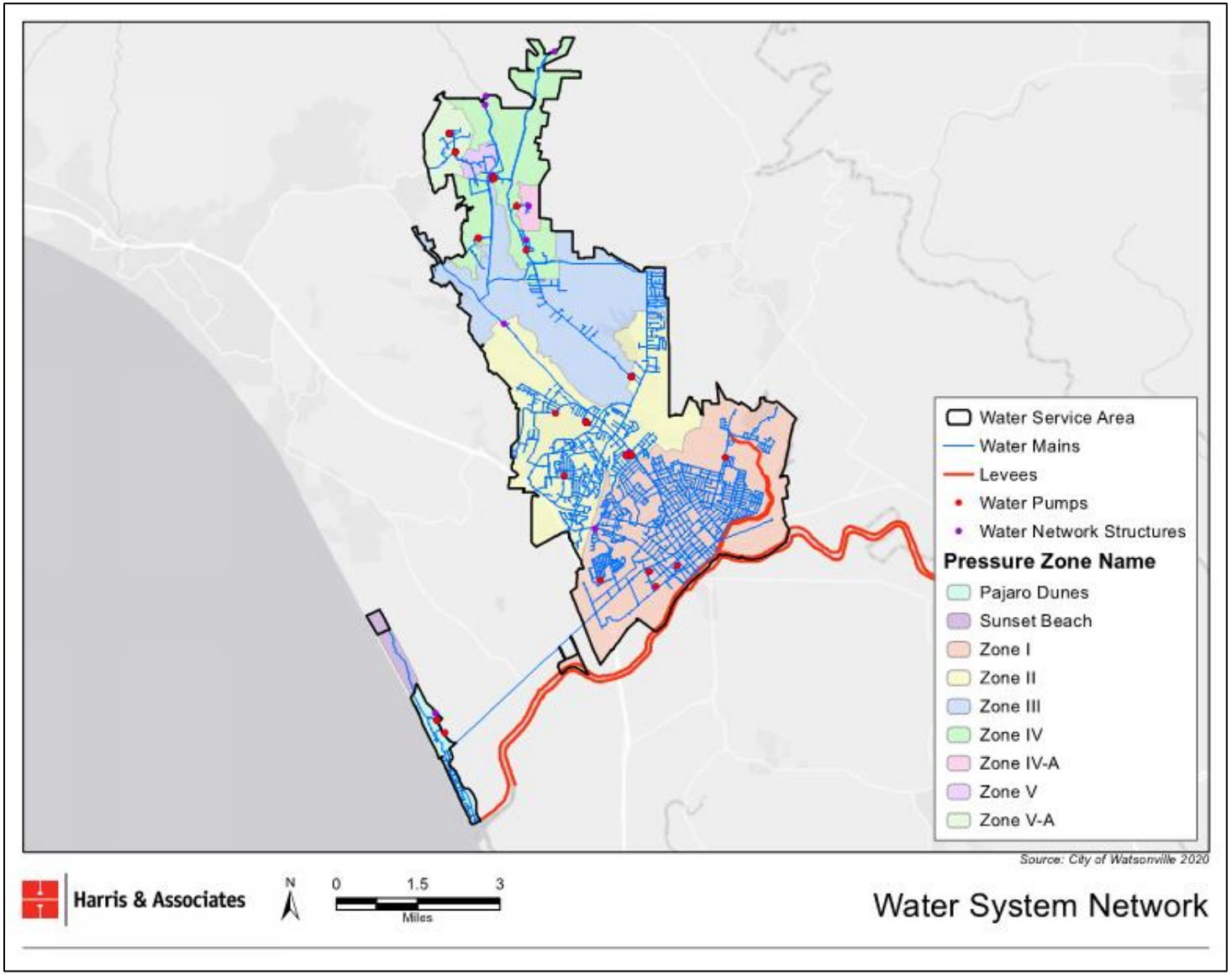


FIGURE 3-3: WATER SERVICE AREA



3.3 SERVICE AREA CLIMATE

The City is in a Mediterranean coastal climate, with dry, mild summers and cool winters. Due to its proximity to the coast, fog is common in the night and morning hours, especially in the summer when warmer air from the inland areas mixes with cooler coastal air. Between February 2020 and January 2021, the total evapotranspiration (ETo) was 45.2 inches (CIMIS 2021).[1] The historical average annual maximum temperature between 1990 and 2020 was 57.8°F, and the average annual precipitation was 22.88 inches (NOAA 2016).

3.4 CLIMATE CHANGE

There is scientific evidence that global climate conditions are changing and will continue to change as a result of the continued build-up of greenhouse gases (GHGs) in the earth's atmosphere. Changes in climate can affect water supply and water quality through modifications in the timing, amount, and form of precipitation. Increased temperatures influence water supplies through evapotranspiration and increased water demands—particularly for agriculture. Climate change is also expected to affect storm intensity, flooding, riparian and aquatic habitat and ecosystems, and seawater intrusion. To better understand and respond to these vulnerabilities, regional agencies have conducted numerous climate vulnerability studies.

3.4.1 CLIMATE CHANGE VULNERABILITY STUDIES

PV Water, the San Benito County Water District (SBCWD), and the Santa Clara Valley Water District (SCVWD) entered into a Memorandum of Understanding (MOU) to coordinate water resources planning and implementation activities watershed-wide. The three agencies, collectively known as the Pajaro River Watershed Collaborative, led the development and implementation of the 2007 Pajaro River Watershed IRWM Plan. The Plan was last updated in October 2019 (2019 Pajaro IRWMP) and is included as Appendix 3-1. The 2019 Pajaro IRWMP discusses the potential effects of climate change on the IRWM region, including an evaluation and prioritization of the IRWM region's vulnerabilities and potential adaptive responses to those vulnerabilities.

The City relies primarily on groundwater from the Pajaro Valley Groundwater Subbasin (Subbasin), which lies within the Pajaro River Watershed Integrated Regional Water Management (IRWM) area, as depicted in Figure 3-4 and Figure 3-5.[2] The Basin Management Plan, developed by PV Water, outlines management of the Subbasin and is discussed in more detail in Chapter 6.

[1] California Department of Water Resources, "California Irrigation Management Information System (CIMIS)" Web site, https://cimis.water.ca.gov/UserControls/Reports/MonthlyReportViewer.aspx (Accessed 2/8/2021).

[2] Pajaro Valley Water Management Agency Web site, Sustainable Groundwater Management (Accessed 2/17/2021).

FIGURE 3-4: PAJARO RIVER WATERSHED AND PV WATER BOUNDARIES

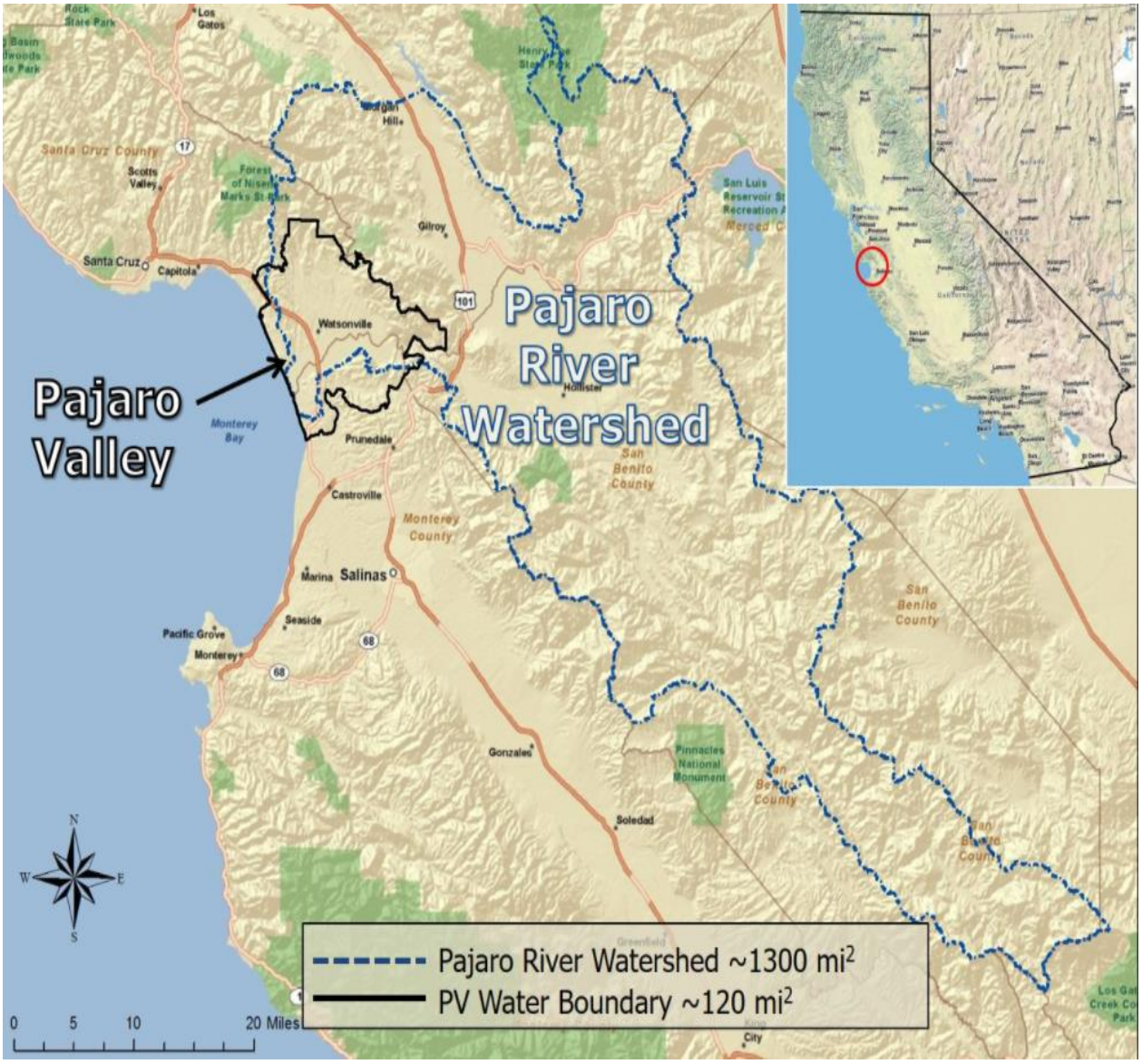
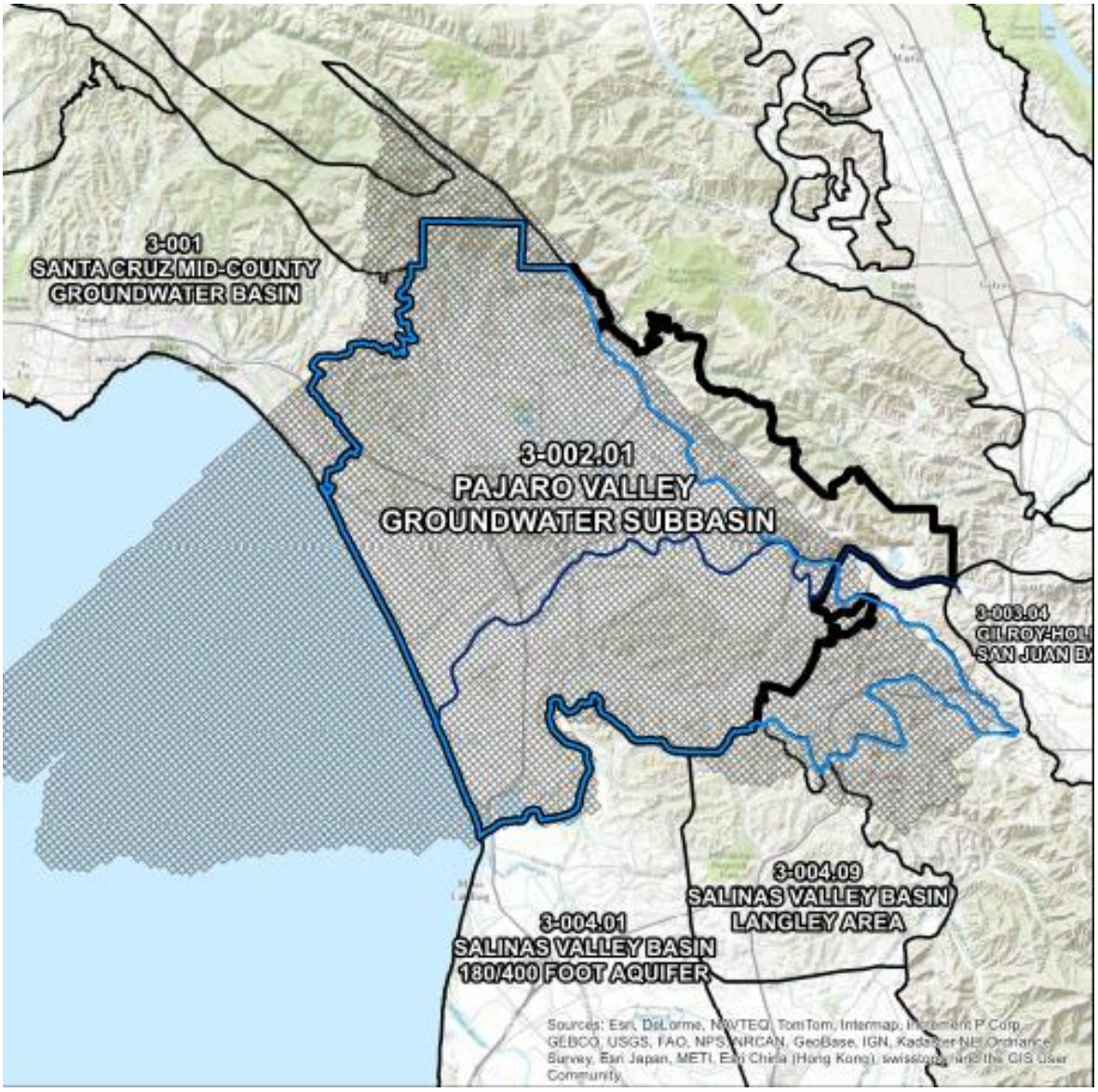


FIGURE 3-5: PAJARO VALLEY GROUNDWATER SUBBASIN



Based on the Pajaro IRWMP assessment, climate change vulnerabilities were identified in the following areas: water demand, water supply, water quality, sea-level rise, flooding, and ecosystem and habitat. Key findings that relate to this UWMP are summarized below, followed by more detailed discussions:

- Water Demand Vulnerabilities
    - Increased agricultural irrigation demands
    - Increased landscape irrigation demands
    - Increased cooling demands
    - Increased environmental demands
- Water Supply Vulnerabilities
    - Increased groundwater overdraft
    - Increased seawater intrusion
    - Reduced drought reliability
- Sea-Level Rise Vulnerabilities
    - Increased coastal flooding
    - Reduced habitat quality
    - Increased damage to existing infrastructure
- Flood Management Vulnerabilities
    - Increased flooding
    - Reduced imported water supplies
- Ecosystem and Habitat Vulnerabilities
    - Reduced habitat availability
    - Reduced habitat quality
    - Reduced water quality

PV Water has performed modeling to assess the impact of climate change on water supplies in the Pajaro Valley. PV Water collaborated with the USGS to conduct an analysis of select, long-term climate projections to support water resource managers, stakeholders, and directors in the planning, development, and implementation of new water supply projects and programs.

PV Water continues to work with the USGS to help inform and guide water resources management. Additionally, PV Water maintains groundwater and surface water monitoring programs that collect and store data pertaining to surface and groundwater quality and quantity. These programs track and analyze changes through time and inform water management and planning efforts.

3.4.2 CLIMATE IMPACT ON WATER DEMAND

The seasonal variability of water demand is projected to increase with climate change as droughts become more common and more severe. Warmer temperatures increase evapotranspiration rates while extending the length of growing seasons, resulting in an overall increase in agricultural water demands. Some crops are more climate-sensitive and

may require more water to maintain yield and quality in future years. Streamflow volumes needed to support habitat (environmental water demand) may also be impacted by increased temperatures. Climate change is also projected to impact seasonal water demands, such as landscape irrigation.

3.4.3 CLIMATE IMPACT ON WATER SUPPLY

Depending on the year, 90–100 percent of water supplied by the City is from groundwater sources, while surface water accounts for the remainder. The City's wastewater treatment facility provides feed water to a joint PV Water/Watsonville Recycled Water Facility (RWF), which has a design capacity of up to 4,000 AFY. This recycled water is intended for agricultural purposes only and is not included in total water supply volume calculations.

Climate change is projected to increase the severity and frequency of drought events.[3] Surface water sources are more vulnerable to drought events. Because the City can fully rely on groundwater, it is somewhat less susceptible to drought impacts. However, the City remains vulnerable to a particularly severe and prolonged drought, as surface waters recharge aquifers.

Drought events may also result in groundwater overdraft, which exacerbates saltwater intrusion. Groundwater overdraft occurs when groundwater use exceeds the amount of recharge into an aquifer, which leads to a decline in groundwater levels. Overdraft has been a concern in the Subbasin since 1980, when the California Department of Water Resources issued Bulletin 118-80 designating the basin as critically overdrafted, with seawater intrusion being one of the reasons for the designation.

Saltwater intrusion occurs when too much groundwater is pumped from coastal aquifers (overdraft), thereby upsetting the subterranean balance between inland freshwater and the ocean. Saltwater intrusion has moved further inland over the past 25 years, and without intervention, further saltwater intrusion is expected, particularly during drought events.[4]

Chapter 6 provides additional information on PV Water's important projects and management of the Subbasin.

[3] IPCC (Intergovernmental Panel on Climate Change). 2014. Climate Change 2014 Synthesis Report: Summary for Policymakers. Accessed April 2020. https://www.ipcc.ch/site/assets/uploads/2018/02/AR5_SYR_FINAL_SPM.pdf.

[4] Wallace, Mike, and Brian Lockwood. 2010. Annual Report 2010. Watsonville, California: Pajaro Valley Water Management Agency.

3.4.4 OTHER CLIMATE IMPACTS

Other potential negative impacts of climate change include sea-level rise, increased flooding, agricultural impacts, and deleterious effects on natural ecosystems and habitat. These are discussed briefly below.

Seal-Level Rise

In addition to direct flooding, rising sea levels are expected to result in higher groundwater levels during extreme tides, affecting natural drainage and urban stormwater systems. Combined with more intense precipitation events, sea-level rise will threaten the ability of stormwater systems to cope with the required discharge and could result in increased flooding. Rising sea levels also increase saltwater intrusion, exacerbating issues related to groundwater over-extraction.

Identifying thresholds beyond which the stability and performance of existing water, wastewater, and stormwater systems are adversely impacted is important to understanding the current and future vulnerability to changing coastal water levels. Several infrastructure facilities, especially those along the coast, are at risk of inundation at a four-foot sea-level rise.[5] The City's Local Hazard Mitigation Plan (LHMP) addresses this risk; Figure 3-6 shows the projected inundation depth at the four-foot sea-level rise.

Increased Flooding

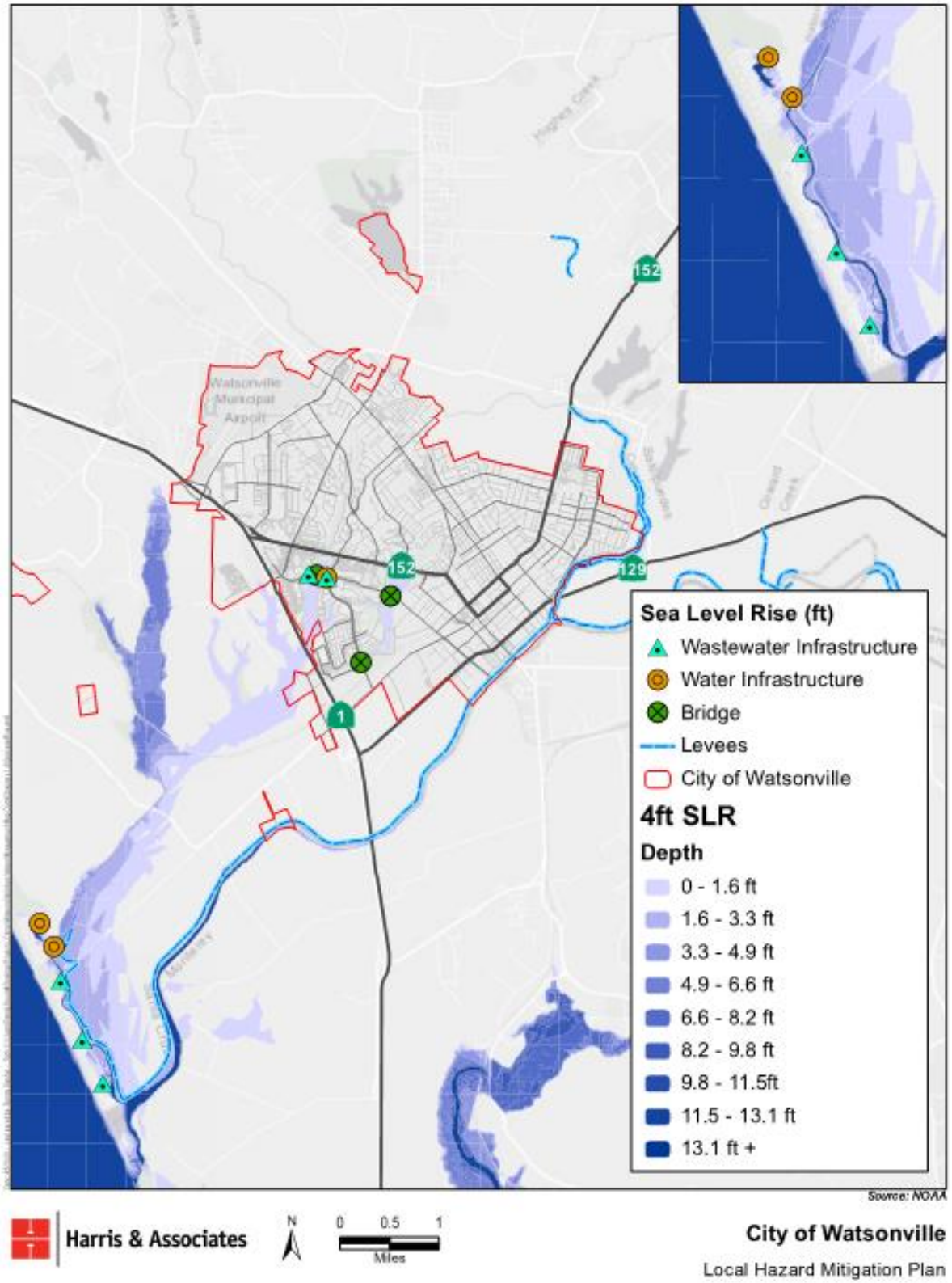
The LHMP notes that flooding poses numerous risks to the following critical facilities and infrastructure:

- Creek or river floodwaters can back up stormwater systems, causing localized flooding.
- Culverts can be blocked by debris from floodwaters, causing localized urban flooding.
- Floodwaters can penetrate drinking water supplies, causing contamination.
- Sewer systems can back up, causing waste to spill into residences, commercial and industrial establishments, neighborhoods, rivers, and streams.

The impacts due to sea-level rise include increased coastal flooding and damage to existing infrastructure. The IRWMP further notes that the City and surrounding agricultural areas are subject to flooding during a 100-year coastal flood. The impacts due to flooding include temporary and/or permanent displacement of residences, businesses and municipal facilities. The City is a low-lying, economically disadvantaged community (DAC) that will be particularly vulnerable to flooding damages caused by more intense storms and sea-level rise.

[5] City of Watsonville. 2020. City of Watsonville Local Hazard Mitigation Plan. Prepared by Harris & Associates. September. https://www.cityofwatsonville.org/DocumentCenter/View/15463/City-of-Watsonville-Local-Hazard-Mitigation-Plan.

FIGURE 3-6: PROJECTED INUNDATION DEPTH AT 4-FOOT SEA-LEVEL RISE



Agricultural Impacts

The 2014 Pajaro Valley Water Management Agency Basin Management Plan Update (Appendix 6-1) notes that land use in the Pajaro Valley is primarily agricultural. Surveys in 2011–2013 indicated that berries and vegetables were the predominant crop. Recently, there has been a trend toward increased cannabis cultivation. At this early stage in the legal cannabis industry, water use required for cannabis cultivation is not well understood, particularly in comparison to berries and vegetables. Regardless, a reduction in regional water supplies could severely impact agriculture and, in turn, harm the economy of the region and the City. The agricultural community is well aware of this issue and is making significant advances in water conservation by implementing climate-based irrigation systems and other technologies. Substantial water savings could result from these efforts. Continued efforts and vigilance are required to manage the delicate balance between water supply and demand.

Conversely, the region's agriculture is also vulnerable to floods. Flooding on the Pajaro River can result in debris deposits and erosion of agricultural soils that lead to crop losses. In March 1995, flooding caused total economic losses of over $95 million dollars, including $67 million in damage to agricultural fields in the nearby town of Pajaro.[6]

Ecosystems and Habitat

The impacts of climate change on ecosystems and habitat include erosion and sedimentation, increased temperatures, drought conditions, and reduced water quality and flow. Estuarine habitats, such as the Watsonville Slough, could be impacted by reduced seasonal freshwater flows. The City's coastal ecosystems may be particularly vulnerable to acidification and changes in salinity balances, sedimentation, and nutrient flows.

Environmental impacts may include the following:

- Loss or destruction of fish and wildlife habitats
- Lack of food and drinking water for wildlife
- Migration of wildlife
- Increased stress on native, locally rare, and threatened and endangered species
- Loss of wetlands
- Wind and water erosion of soils

Floodwater can be devastating for the surrounding ecosystem. Agricultural chemicals, including fertilizers and pesticides, and other pollutants, such as paint or gasoline, can contaminate natural habitats and the groundwater.

[6] USACE (U.S. Army Corps of Engineers). 2017. Pajaro River Flood Risk Management General Reevaluation Report & Integrated Environmental Assessment. Draft General Reevaluation Report and Integrated EA. October. Accessed April 2020. https://www.spn.usace.army.mil/Portals/68/docs/Environmental/Main%20Report%20FINAL%20DRAFT.pdf?ver=2017-10-31-112545-690.

3.5 SERVICE AREA POPULATION AND DEMOGRAPHICS

3.5.1 POPULATION

According to the City's 2015–2023 Housing Element, the City has developed in a compact, dense pattern due to constraints from environmental features, farmland, and County growth management policies.

The U.S. Census Bureau's 2019 American Community Survey (ACS) estimates that the City had 15,196 housing units; this represents a 3 percent growth rate over the 2015 ACS estimate of 14,744 housing units.[7] The City has identified a variety of vacant and underutilized sites where new housing may continue to be developed, including infill sites, mixed-use opportunities, and single-family neighborhoods where second units may be added.

The estimated 2020 population of Watsonville's WSA is 65,231. The methods for estimating this number can be found in Appendix 3-2.

2020–2045 population estimates are shown in Table 3-1. The City of Watsonville is currently updating its water master plan. Work from this project was used as a basis for 2025–2045 population projections. Relevant pages from the project's draft appendix are included as Appendix 3-3. The appendix provided estimates for 2020, 2035, and 2040. Growth rates were extrapolated to get 2025, 2030, and 2045 estimates.

TABLE 3-1: POPULATION – CURRENT AND PROJECTED

2020	2025	2030	2035	2040	2045
65,231	67,426	69,696	72,041	73,576	74,764

3.5.2 OTHER SOCIAL, ECONOMIC, AND DEMOGRAPHIC FACTORS

The City of Watsonville enjoys more affordable housing in the City than in other Santa Cruz County communities; a beautiful, temperate location; and a relatively young and ethnically diverse population. These and other attributes continue to draw new residents. From 2010 to 2019, the City saw a population growth rate of 0.57 percent per year.

Table 3-2 compares 2019 demographics for the City, the County of Santa Cruz, the State of California, and the United States. These statistics highlight the youthful nature of the community and its diversity with 75 percent of households reporting a language other than English spoken in the home. The City also has a significantly lower than average household income, and slightly higher than average poverty rate. The median home value in 2019 was much lower than the County average but was still high given the median household income.

[7] U.S. Census Bureau, American Community Survey: ACS 5-Year Estimates Data Profiles, 2015 and 2019.

HUD defines moderate cost-burdened households as those "spending more than 30 percent of their income for housing" and severe cost-burdened households as those "spending more than 50 percent of their income on housing." Households that have a median household income of $4,500 per month ($54,000 per year) in Watsonville would be paying over 30 percent of their income on rent for an efficiency apartment and over 50 percent of their income on a 2-bedroom home, indicating that the average household is moderately or severely cost-burdened.[8]

TABLE 3-2: SELECT DEMOGRAPHICS

	WATSONVILLE	SANTA CRUZ COUNTY	CALIFORNIA	U.S.
2019 Population	53,800	273,962	39,512,223	328,239,523
Median Age	30.6	37.8	37.0	38.1
Median Household Income	55,470	82,234	80,440	65,712
Median Home Value, Owner-Occupied Units	464,200	839,500	568,500	240,500
Poverty Rate	14.8%	13.1%	11.8%	12.3%
High School Graduate or Higher (>=25 Years Old)	60.8%	86%	84%	88%
Language Other than English Spoken at Home	75%	32%	45%	22%

Note: The WSA is larger than the City of Watsonville; however, demographic data is not available for the WSA.

Source: 2019 ACS 5-Year Estimates, Map Survey Program, https://data.census.gov/cedsci/.

3.6 LAND USE

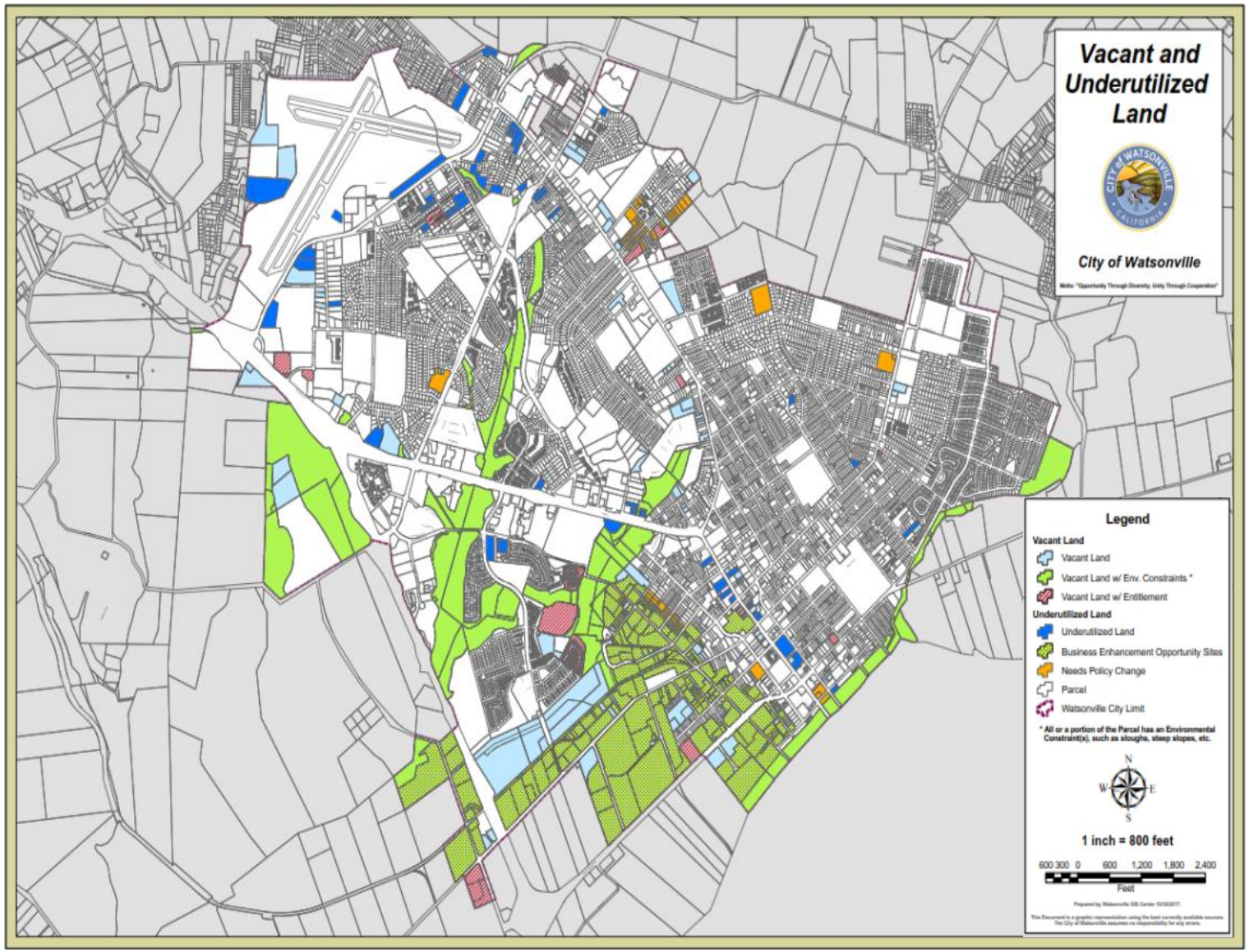
The City's 2015–2023 Housing Element report notes that diminishing housing affordability in neighboring northern Santa Cruz County jurisdictions continues to increase the demand for housing in the City of Watsonville, resulting in increased housing prices, overpayment, and overcrowding for Watsonville residents. According to the report, Watsonville's share of the state regional housing goal to support future housing needs is 700 units through 2023.

The Association of Monterey Bay Area Governments (AMBAG) is responsible for allocating state housing goals. AMBAG's latest estimates project City housing to increase from 14,226 units in 2020 to 16,519 units in 2045, a growth rate of 16 percent.

The City has done extensive work to estimate future water demand in its WSA based on future land use projections. City-developed data on vacant and underutilized land is presented in Figure 3-7. This data is derived from the City's Community Development Department, the County's Planning Department, and the 2005 General Plan. The blue shaded areas represent vacant parcels without constraints that may be developed over the next 20 years. The City is currently in the process of developing a downtown specific plan that addresses housing through densification.

[8] City of Watsonville Draft Environmental Justice Element, November 2020, prepared by Harris & Associates.

FIGURE 3-7: VACANT AND UNDERUTILIZED LAND



This page intentionally left blank.

4 WATER SYSTEM USE

4.1 RECYCLED VERSUS POTABLE AND RAW WATER DEMAND

Chapter 4 addresses potable water demand for 2020 and projected potable water demand through the planning horizon, 2045. Recycled water is addressed comprehensively in Chapter 6, but a summary of recycled water demand is included in Table 4-3.

4.2 WATER USES BY SECTOR

The City's Public Works and Utilities' Customer Services Department, which is responsible for all customer water meter reads, determines the amount of water delivered by the City. The City's 2020 potable water deliveries are shown in Table 4-1. The City's water use over the last five years can be found in Appendix 4-1, Public Water System (PWS) Statistics.

TABLE 4-1: DEMANDS FOR POTABLE WATER

USE TYPE	2020 ACTUAL		
	ADDITIONAL DESCRIPTION	LEVEL OF TREATMENT WHEN DELIVERED	VOLUME (AFY)[1]
Single-Family		Drinking Water	3,329
Multi-Family		Drinking Water	839
Commercial		Drinking Water	1,136
Industrial		Drinking Water	535
Institutional/Governmental	Included in Commercial	Drinking Water	n/a
Landscape		Drinking Water	471
Agricultural irrigation		Drinking Water	729
Other		Drinking Water	43
Losses		Drinking Water	20
		TOTAL	7,102

[1] Source: City's 2020 PWS statistics, found in Appendix 4-1.

Water deliveries projected within the City's WSA for 2025 through 2045 are shown in Table 4-2. Calculations were based on the City's 2015–2020 usage and projected population growth. Water use reductions from codes, ordinances, and demand management measures were assumed to have been included in historical usage data—no additional reductions from these measures for the future were included in the calculations. The City and its residents have been particularly effective in reducing residential water use, as discussed in Chapters 5 and 9. In developing future projections, it was assumed that there may be only minor additional decreases in indoor water usage per household; however, the effects of climate change (e.g., drought occurrences and temperature changes) would increase outdoor water usage over time, resulting in an assumed net-zero change for residential water use projections.

This conservative approach is consistent with the City's master planning approach. While the master plan is still under development, the demand projections included in this report closely parallel the draft master plan projections. The approach used to calculate future water demand varies by use type; additional detail is provided in Appendix 4-2.

TABLE 4-2: USE FOR POTABLE WATER – PROJECTED

USE TYPE		PROJECTED WATER USE (AFY)				
		2025	2030	2035	2040	2045
Single-Family		3,267	3,377	3,491	3,565	3,623
Multi-Family		854	883	913	932	947
Commercial	Includes Institutional	1,214	1,220	1,226	1,232	1,238
Institutional/Governmental	Included in Commercial					
Industrial		536	536	536	536	536
Landscape		475	475	475	475	475
Agricultural irrigation		840	891	942	993	1,045
Other		43	43	43	43	43
Losses		478	478	478	478	478
TOTAL		7,707	7,903	8,104	8,255	8,384

The City operates a recycled water treatment facility that can provide up to 4,000 AFY of recycled water. This facility is not connected to the City's distribution system; instead, PV Water manages the distribution of recycled water to agricultural users in the Pajaro Valley. Table 4-3 shows total water use, including the recycled water.

TABLE 4-3: TOTAL WATER USE (POTABLE AND NON-POTABLE)

WATER USE (AFY)	2020	2025	2030	2035	2040	2045
Potable Water, Raw, Other Non-Potable	7,102	7,707	7,903	8,104	8,255	8,384
Recycled Water Demand	3,434	4,000	4,000	4,000	4,000	4,000
Deduction for Recycled Water Demand Distributed by PV Water Outside the Service Area	-3,331	-3,880	-3,880	-3,880	-3,880	-3,880
TOTAL	7,205	7,827	8,023	8,224	8,375	8,504

4.3 DISTRIBUTION SYSTEM WATER LOSSES

The City's distribution system losses were quantified using the American Water Works Association (AWWA) Free Water Audit Software. Reporting worksheets of the audits are submitted to DWR annually.

A percentage of unaccounted for water is attributed to system losses. The City's water losses over the last five years averaged 8 percent of distributed water; reported water losses can be found in Table 4-4, with detailed Water Loss Worksheets provided in Appendix 4-3.

According to DWR, a detailed water audit and leak detection program of 47 California water

utilities found an average loss of 10 percent (Water Use Efficiency, 2015); the City's average water loss is approximately 8 percent, which falls below the state's average and is expected to meet the state performance standard.

TABLE 4-4: LAST FIVE YEARS OF WATER LOSS AUDIT REPORTING

REPORTING PERIOD START DATE	VOLUME OF WATER LOSS (AFY)
01/2016	273
01/2017	248
01/2018	872
01/2019	978
01/2020	n/a
Source: City's AWWA Water Loss Worksheets 2016–2019. At the time of UWMP report completion, the 2020 AWWA Water Loss Worksheet was not available as it had not been reviewed by AWWA certified validators.	

4.4 WATER USE FOR LOWER INCOME HOUSEHOLDS

The City is an economically disadvantaged community (DAC). DAC status was determined based on the DAC definition provided in DWR's Proposition 84 and 1E IRWM Guidelines. A median household income (MHI) of less than $61,600 is the DAC threshold (80 percent of the statewide MHI). The City, a 2010 Census Designated Place, had an MHI of $55,470 (in 2019 dollars), which is below the threshold and confirms its DAC status.

The City of Watsonville 2015–2023 Housing Element identifies that, of the City's share of the Monterey Bay Area's regional housing needs, 40 percent be designated to meet the needs of low-, very low-, and extremely low-income households in the years 2015–2023. Therefore, the projected water demands for low-income housing are projected at 40 percent of the water use. As a retail urban water supplier, the City must ensure that water supplies are available for these households. The City has included low-income housing in the water use projections (Table 4-5).

In developing water demand estimates, no future savings were estimated to occur from future codes, standards, or ordinances (Table 4-5).

TABLE 4-5: INCLUSION IN WATER USE PROJECTIONS

ARE FUTURE WATER SAVINGS INCLUDED IN PROJECTIONS?	No
ARE LOWER INCOME RESIDENTIAL DEMANDS INCLUDED IN PROJECTIONS?	Yes
Note: The City is a DAC and includes lower income residential demands into both single- and multi-family residential water demands.	

4.5 CLIMATE CHANGE

Climate change and regional efforts to reduce agricultural impacts on water supplies are discussed in detail in Chapters 3 and 6. The City's successful programs to reduce residential water use are discussed in Chapter 9. Continued efforts by the City, PV Water, residents, businesses, and farmers are necessary to offset potential climate change and growth impacts.

This page intentionally left blank.

5 SB X7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE

The Water Conservation Act of 2009 (also known as Senate Bill X7-7 or SB X7-7) is a California state law that requires the state to reduce urban water consumption by 20 percent by the year 2020. Urban water consumption is measured as gallons per capita per day (GPCD). GPCD is the total water use from all sectors (residential, commercial, institutional, and any others) within the WSA, minus allowable exclusions, then divided by the population. DWR developed the methodologies for urban water suppliers to calculate a baseline GPCD and to demonstrate achievement of the 2020 target reduction of 20 percent.

The City developed a baseline GPCD in 2010, reported significant progress in achieving its 20 percent reduction through 2015, and is pleased to demonstrate that the City met its 20 percent reduction goal in 2020, as discussed in further detail below.

5.1 SB X7-7 FORMS AND CALCULATIONS

The DWR requires detailed forms to ensure that agencies are meeting the 2020 targets. There are two major sets of forms:

- SB X7-7 Verification Tables (Appendix 5-1)
- SB X7-7 2020 Compliance Form (Appendix 5-2)

DWR published detailed Methodologies for the SB X7-7 Verification Tables. The Verification Tables have not changed since 2015.

The SB X7-7 2020 Compliance Form is new. The WSA's 2020 population and 2020 gross water use are key data points in this Compliance Form and are discussed in Sections 5.2 and 5.3.

5.2 SERVICE AREA POPULATION

The City's WSA extends beyond the City limits into areas of unincorporated Santa Cruz County. The WSA encompasses portions of multiple census tracts. Historically, gathering population data was an extensive exercise.

For the 2020 UWMP, the City relied on the DWR Population Tool to assist in estimating 2020 population figures. The tool used number of service connections and historical persons-per-connection to calculate a 2020 population of 65,231 people in the City's WSA. To validate the tool results, the population growth rate for the City was compared to the population growth rate for the WSA, as further described in Appendix 3-2.

Historical and current population estimates for the WSA are shown in Figure 5-1.

FIGURE 5-1: HISTORICAL AND CURRENT POPULATION ESTIMATES, RESIDENTIAL CONNECTIONS, AND PERSONS PER CONNECTION

Year	Population	Residential Connections*	Persons/ Connection	2010-2020 Growth Rate
2000	59,003	11,089	5.321	
2001	58,517	11,196	5.227	
2002	58,445	11,226	5.206	
2003	59,502	11,474	5.186	
2004	61,572	11,920	5.165	
2005	69,982	13,602	5.145	
2006	70,412	13,740	5.125	
2007	70,275	13,768	5.104	
2008	68,306	13,436	5.084	
2009	69,136	13,654	5.063	
2010**	64,657	12,821	5.043	
2011	63,626	12,668	5.023	
2012	63,588	12,712	5.002	
2013	63,687	12,784	4.982	
2014	63,436	12,786	4.961	
2015	65,966	12,835	5.140	
2020	65,231	12,935	5.043	
				0.89%

*Includes both Single Family Residential and Multi Family Residential

** 2010 Data not available. Persons/connection calculated as average of 2009 and 2011.

5.3 GROSS WATER USE

Per the DWR tables and methodologies, gross water use was calculated as water leaving the treatment plant, adjusted for a number of variables. The City deducted water for agricultural use, based on metered data.

DWR allowed additional adjustments for industrial process water, extraordinary events, weather normalization, and economic adjustments. While 2020 was an exceptional year from numerous standpoints—COVID-19, economic changes, and drought—the City complied with 2020 targets without requiring any additional adjustments. The City's 2020 gross water use reported for the purpose of calculating GPCD was 6,373 AFY.

5.4 BASELINE AND TARGETS SUMMARY

Baseline GPCD water usage was calculated in the 2010 UWMP. A summary of the baselines and target is provided in Table 5-1. For 2001–2010, the City's Baseline GPCD was 101. For 2006–2010, Baseline GPCD was 95. The City's 2020 Target was established as 95 percent of the Hydrologic Regional Target. The City is located in the Central Coast region, with a target level of 123 GPCD. Ninety-five percent of the target level is 117 GPCD, which is the City's 2020 Target.

TABLE 5-1: BASELINES AND TARGETS SUMMARY FROM SB X7-7 VERIFICATION FORM

BASELINE PERIOD	START YEAR	END YEAR	AVERAGE BASELINE GPCD	CONFIRMED 2020 TARGET
10–15 Year	2001	2010	101	117
5 Year	2006	2010	95	

5.5 2020 COMPLIANCE GPCD

The City's 2020 GPCD was 87 GPCD, which exceeded the targeted reduction (Table 5-2). This is significantly lower than the City's targeted regional 117 GPCD. Because the City relies on a vulnerable subbasin for 90–100 percent of its water supply, it is important to maintain this lower usage. As discussed in Chapters 8 and 9, the City's Water Shortage Contingency Plan and Demand Management Measures appear to have been highly successful and remain critical to the City's water resilience.

TABLE 5-2: 2020 COMPLIANCE FROM SB X7-7 2020 COMPLIANCE FORM

2020 GPCD			2020 CONFIRMED TARGET GPCD	DID SUPPLIER ACHIEVE TARGETED REDUCTION FOR 2020? Y/N
ACTUAL 2020 GPCD	2020 TOTAL ADJUSTMENTS	ADJUSTED 2020 GPCD		
87	0	87	117	Yes

This page intentionally left blank.

6 SYSTEM SUPPLIES

6.1 PURCHASED OR IMPORTED WATER

The City does not purchase or import water.

6.2 GROUNDWATER

The City pumps groundwater from the Pajaro Valley Groundwater Subbasin 3-002.01 (Subbasin), which is one of two basins located in the Corralitos Basin. The Aromas Red Sands formation is considered the primary water bearing geologic unit of the basin.[1] There are also water deposits in other layers, including the Purisima Formation, Terrace and Pleistocene Eolian Deposits, Quaternary alluvium, and Dune Deposits. The basal gravel unit also has good hydraulic continuity with the underlying Aromas Red Sands Formation and is a major source of water for shallow wells in the Pajaro River floodplain. In 2020, total groundwater extraction from the Subbasin measured 45,664 acre-feet. The City used approximately 16 percent of this groundwater pumped from the Subbasin. However, when supplemental water that the City delivers to the RWF is deducted (see Table 6-4 below), the City's share of groundwater pumped drops to 14 percent.

6.2.1 MANAGEMENT OF THE PAJARO VALLEY SUBBASIN

Groundwater resources in the Subbasin have been managed by the Pajaro Valley Water Management Agency (PV Water) since the agency's formation in 1984. PV Water is a state-chartered water management district formed to manage existing and supplemental water supplies in order to prevent further increase in, and to accomplish continuing reduction of, long-term overdraft. PV Water also works to provide and ensure sufficient water supplies for present and future anticipated needs within its boundaries, generally the greater coastal Pajaro Valley.

A Basin Management Plan (BMP) and Environmental Impact Report (EIR) were first adopted by PV Water in 1993. The BMP has been subsequently updated, with the 2014 Basin Management Plan Update (2014 BMP) being the most recent. The 2014 BMP screened 44 programs and projects of which seven were selected for inclusion in a BMP portfolio that would eliminate overdraft and reduce the rate of seawater intrusion by 90 percent.

Under the Sustainable Groundwater Management Act (SGMA), the DWR assessed and prioritized basins throughout California. The Pajaro Valley Subbasin received the maximum possible level of Priority Points (40), making it a High Priority Basin that was critically overdrafted. As such, the Act required a Groundwater Sustainability Plan (GSP) or an Alternative to a GSP to be developed for the Subbasin. The Subbasin is not adjudicated,

[1] California Groundwater Bulletin 118.

meaning that no court or board has adjudicated the rights of the City, landowners, or other agency to pump groundwater from the Subbasin.

In December 2016, PV Water submitted the 2014 BMP as an Alternative to a GSP (Appendix 6-1) to comply with SGMA. In 2019, DWR approved the Alternative as functionally equivalent to a GSP; essentially, that it satisfied the objectives of the Sustainable Groundwater Management Act (SGMA). PV Water is currently implementing the projects and programs outlined in the 2014 BMP and is also performing the first five-year update of the Alternative to a GSP as required under SGMA.

Key stakeholders identified by PV Water's Communication and Engagement Plan[2] fall into the following categories:

- Cities
- Counties
- Rural Residential Users
- Agricultural Water Users
- Municipal Water Suppliers in Urban Areas
- Industrial Users
- Commercial Users
- Remediation Pumpers
- Natural Ecosystems
- General Public
- Land Use Authorities
- Private Well Owners
- Public Agencies
- Environmental Interests
- Disadvantaged Communities (DACs)
- Native American Tribes

6.2.2 SUBBASIN BMP IMPLEMENTATION PROGRESS

In September of 2000, 51 square miles of the 110-square-mile basin had water levels less than sea level. Between 1964 and 1997, freshwater storage in the basin decreased by an estimated 300,000 AF. Approximately 200,000 AF was attributed to seawater intrusion, while 100,000 AF was attributed to chronic overdraft.[3]

[2] PV Water, Communication and Engagement Plan—Basin Management Plan: Groundwater Sustainability Update (2022), October 30, 2020, https://www.pvwater.org/images/board-and-committees/Sustainable-GW-Planning-Committee/PVWater_CE_Plan_Oct302020.pdf, p. 6.

[3] Pajaro Watershed Information Center web site, History and Background, http://www.pajarowatershed.org/Content/10109/HistoryandBackground.html (Accessed June 2, 2021).

Today, PV Water leads numerous efforts to assess the impact of climate change and groundwater pumping in the Subbasin, maintains groundwater and surface water monitoring programs, and tracks and analyzes other types of changes over time. Most importantly, PV Water has and continues to implement numerous projects and programs to address these concerns. One important example is the joint City/PV Water Recycled Water Facility, discussed below and in Section 6.6.

In addition, PV Water has constructed a distribution system to deliver water from recycled, blended, and potable water sources to growers in the coastal portion of the Subbasin. While the recycled water is slightly more expensive than well water, some growers have limited viable water sources and may rely solely on delivered water, or a mix of delivered and well water, or solely on well water.

PV Water has completed multiple water supply projects and implemented agricultural and domestic water use conservation programs, which work in conjunction to help reduce overdraft, lessen seawater intrusion, and improve and protect water quality within the entire basin. The full list of PV Water projects is provided in the 2014 BMP. A partial list of key water supply facilities completed includes:

- **Watsonville Area Recycled Water Treatment Facility (RWF)** – The City of Watsonville and PV Water jointly developed the Watsonville Area Recycled Water Treatment Facility (RWF), which began operation in 2009. The City operates the RWF, and PV Water distributes the recycled water for agricultural uses. Located at the Watsonville Wastewater Treatment Plant, the RWF has the design capacity to produce about 4,000 AFY per year of tertiary treated and disinfected recycled water. Recycled water is augmented with water from the Harkins Slough Facility, Blend Wells, and the City's potable water to increase supply and improve quality for agricultural irrigation needs.
- **Increased Water Storage at City's Wastewater Treatment Plant** – Agricultural demand for recycled water is highest during the day; however, recycled water is also produced during nighttime hours. This project added 1.5 million gallons (MG) of storage capacity, raising total RWF storage capacity to over two MG, and allowing an additional estimated 750 AFY of water supply to meet daytime agricultural water demand.
- **Harkins Slough Managed Aquifer Recharge and Recovery Facility** – This facility allows PV Water to divert, filter, store, and use water from Harkins Slough that would otherwise flow to the Monterey Bay.
- **Coastal Distribution System** – The CDS consists of over 21 miles of pipeline capable of providing a blend of recycled water, Harkins Slough water, and inland groundwater to over 5,500 acres of agricultural land.
- **Blend Wells** – PV Water operates two production wells that augment the supplemental water supply and improve water quality.

The City collaborates with PV Water on many of these projects, particularly the RWF. For the future, the City is working with PV Water on the following two projects that will help reduce agricultural groundwater pumping in the Subbasin:

- **College Lake Integrated Resources Management Project** – Scheduled for completion by 2025, this project includes a weir structure and intake pump station, treatment plant, and 5.5-mile pipeline to convey water from the RWF to supply 1,800–2,300 AFY to agricultural users. While still under design, components of the project will likely pass through the City and may connect to the RWF.
- **Watsonville Slough System Managed Aquifer Recharge and Recovery Projects** – These projects consist of upgrading and expanding the existing Harkins Slough pump station, developing Struve Slough as a water supply source, and constructing a recharge basin. The Struve Slough project is scheduled for completion in 2023 and Harkins Slough pump station in 2025. Portions of the projects are likely to connect to City infrastructure; details are still under investigation.

The City and all groundwater users in the Subbasin currently pay an augmentation fee to PV Water in order to pay the costs (administration, operations, metering, planning, and capital) in proportion to the demands placed on the system and benefits received from PV Water services.[4] The City pays approximately $1.5 million per year, depending on the City's water needs. The augmentation fee is based on the quantity of water extracted from groundwater sources. PV Water uses these funds to implement the 2014 BMP and support proposed water projects that will ultimately prevent further groundwater overdraft and seawater intrusion.

Groundwater overdraft and seawater intrusion are continuing problems in the Subbasin; however, there are some early indicators of success. PV Water's Water Year 2020 Pajaro Valley Subbasin Report[5] reports positive results in both water use and groundwater storage, as shown in Figure 6-1. Improvements to seawater intrusion are discussed in Chapter 3 of this report. Many factors, including precipitation and climate change, affect these results. The City strongly supports the continued diligence of our community in conserving water, as well as the many activities and projects provided through PV Water.

Where appropriate, the City works closely with PV Water to support BMP efforts that increase conservation, develop new water supplies, and optimize the use of existing water supplies.

[4] PV Water, 2021 Cost of Service Rate Study, by Carollo Engineers, February 2021, https://www.pvwater.org/images/2021-Cost-of-Service-Rate-Study-Final_Feb.2021_Final.pdf.

[5] Pajaro Valley Water Management Agency, Pajaro Valley Subbasin Water Year 2020 Annual Report, March 2021, prepared by Casey Meusel and Brian Lockwood, https://www.pvwater.org/images/about-pvwma/assets/annual_reports_assets/SGMA-WY/PVWater_AR_WY2020.pdf.

6.2.3 CITY OF WATSONVILLE GROUNDWATER EXTRACTION

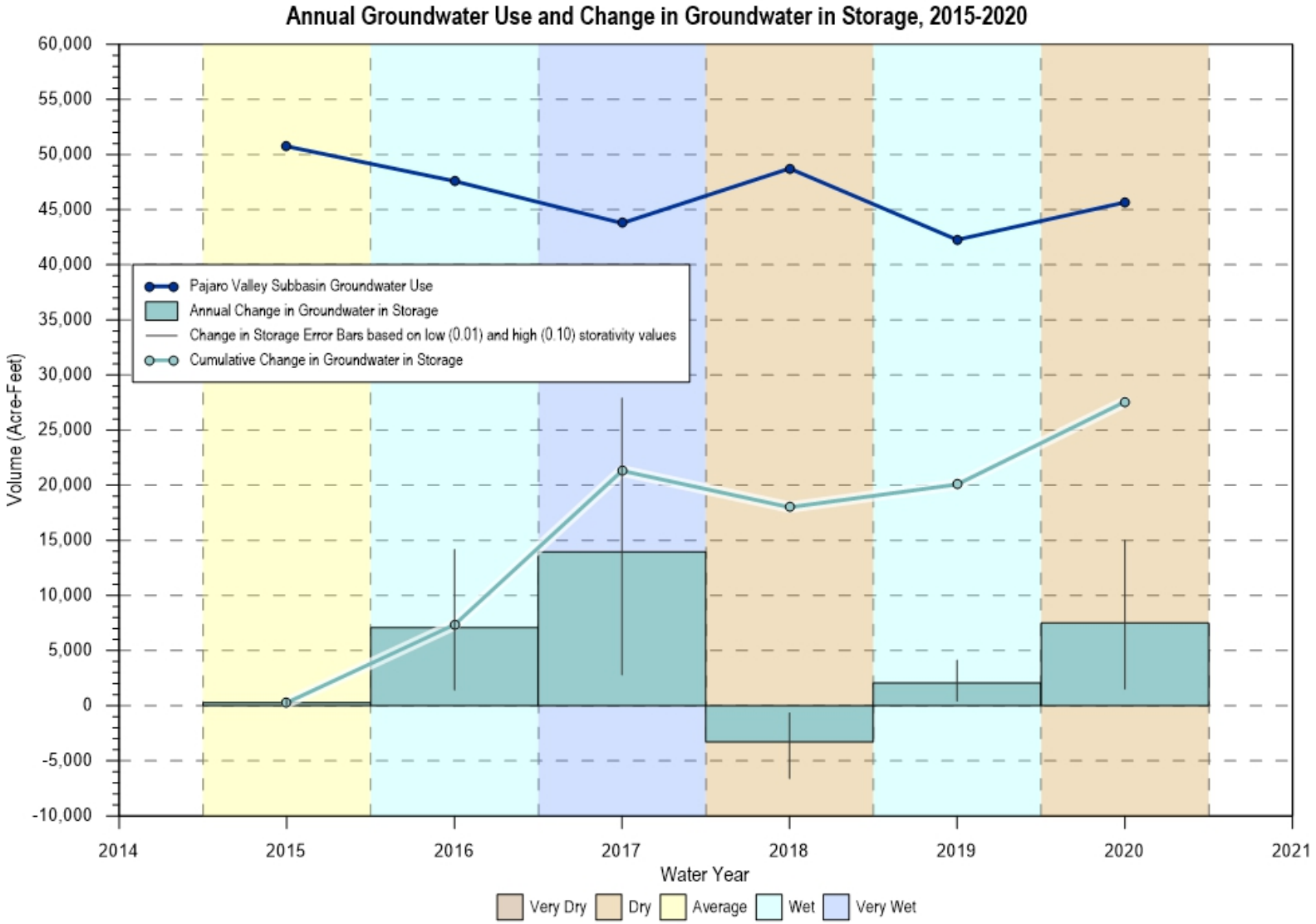
Fourteen groundwater wells provided the City with a range of 6,316 to 7,102 AFY of water over the last five years (Table 6-1). All City water is treated at each well site and meets or exceeds state and federal drinking water standards. The City's wells are capable of providing 21,000 AFY of water. The City intends to continue pumping groundwater from its existing well sources. It is likely that additional sources will be explored for future use to replace aging wells and to provide sufficient redundancy. At this time, the City's wells are capable of providing for both current and projected water demands through the planning period of 2045.

The City relies primarily on its groundwater sources for 90–100 percent of its water supply and continuously monitors groundwater well levels. Seasonal (between winter and summer months) variations in static water levels are common. Fluctuations between three and seven feet have been observed. The City and PV Water will continue collaborative efforts that lead to a sustainably managed groundwater basin and prevent activities that lead to overdraft.

TABLE 6-1: GROUNDWATER VOLUME PUMPED

Groundwater Type	Location or Basin Name	Groundwater Volume Pumped (AFY)				
		2016	2017	2018	2019	2020
Alluvial Basin*	Pajaro Valley	6,461	6,316	6,688	6,585	7,102
	TOTAL	6,461	6,316	6,688	6,585	7,102
* Aromas Red Sands, Purisima.						

FIGURE 6-1: SUBBASIN ANNUAL GROUNDWATER USE, CHANGE IN GROUNDWATER STORAGE, 2015–2020



6.3 SURFACE WATER

During years of average or above average rainfall, the City utilizes a combination of surface water and groundwater supply sources. The City enjoys pre-1914 water rights (S010141 and S010142) on the Corralitos and Browns creeks, which are located north of the City limits. The surface water diversions flow to the Corralitos Filter Plant (CFP) and are treated via slow sand filtration and disinfection. When operational, the CFP treats up to 900 AFY, though it has a maximum design capacity of 2 million gallons per day (MGD). Its operation is limited by the amount of surface water available in the Corralitos and Browns creeks.

The CFP operates seasonally, typically starting in late spring through the fall. During the rainy season, the CFP is usually shut down due to the high turbidity of the creek at the intake. High turbidity is not conducive to the efficiency of a slow sand filtration plant. The City only collects and treats surface water when the creek water turbidity is equal to or less than 10 Nephelometric Turbidity Units (NTU).

6.4 STORMWATER

The City does not plan to recover, treat, and reuse stormwater at this time. However, the City is planning a number of projects for stormwater detention, which will improve water quality and flood protection.

6.5 WASTEWATER TREATMENT FACILITY

The City's Wastewater Treatment Facility (WWTF) collects and treats all of the wastewater (excluding stormwater run-off) from a 21-square-mile service area comprising users within the City, Freedom County Sanitary District, Pajaro County Sanitary District, and Salsipuedes Sanitary District. The WWTF has served as a first line of defense in protecting the Monterey Bay's water quality. The WWTF is located on the Pajaro River, southwest of the City between Highway 1 and the Monterey Bay. More than 170 miles of pipeline are used to transport wastewater to the facility for treatment.

The WWTF treats about 5 million gallons per day (MGD) of wastewater in dry weather. It is permitted to treat up to 12 MGD. In 2020, it treated a total of 1,795 million gallons, or 5,510 AFY (Table 6-2). The wastewater treatment process includes primary sedimentation, biological filtration, aeration, and secondary clarification. In 2009, the City completed its upgrade of the WWTF to include tertiary treatment, making recycled water an available resource.

All secondary treated water undergoes extensive monitoring and testing to ensure compliance with all state and federal pollution prevention laws prior to being discharged to the Monterey Bay over a mile offshore. Tertiary treated water is recycled.

TABLE 6-2: WASTEWATER COLLECTED WITHIN SERVICE AREA IN 2020

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED?	VOLUME OF WASTEWATER COLLECTED FROM UWMP SERVICE AREA 2020 (AFY)	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?
City of Watsonville	Metered	5,510	City of Watsonville	WWTP	Yes	No
TOTAL WASTEWATER COLLECTED FROM SERVICE AREA IN 2020:		5,510				

6.6 RECYCLED WATER TREATMENT FACILITY

The Recycled Water Treatment Facility (RWF) is located at the City's WWTF. The RWF is designed to treat 4,000 AFY of wastewater to recycled water standards (as required under Title 22). In 2020, it provided 3,434 AFY of recycled water. Table 6-3 delineates total volumes of wastewater treated, discharged to ocean outfall, and recycled in 2020. Table 6-4 provides future estimated recycled water use, and Table 6-5 compares 2020 actual and predicted recycled water use.

The RWF provides recycled water for crop irrigation throughout the coastal areas of the South Santa Cruz and North Monterey counties. By treating wastewater and making it available to the local agricultural industry, the RWF protects groundwater by providing an alternative to well extraction, supports the local agricultural industry, and reduces wastewater discharges into the Monterey Bay National Marine Sanctuary.

The City collaborated with PV Water to develop and build the RWF. The City operates the RWF. PV Water manages the distribution of the recycled water to provide agricultural irrigation. Design capacity of the RWF is 10,000 gallons per minute (GPM). Because of limitations in wastewater flow combined with current demand, the recycled water can be supplemented with the City's potable water. The potable water flows are limited to 2,000 GPM, and the City reserves the right to limit this flow at any time. PV Water does not take potable water between midnight and 5 AM without prior approval by Water Operations staff.

Recycled water is provided to nearby farms; however, very little is provided to agriculture within the WSA. No other urban water agency claims credits for this recycled water.

TABLE 6-3: WASTEWATER TREATMENT AND DISCHARGE WITHIN SERVICE AREA IN 2020

NAME	DISCHARGE LOCATION NAME OR IDENTIFIER	DISCHARGE LOCATION DESCRIPTION	METHOD OF DISPOSAL	DOES THIS PLANT TREAT WASTEWATER GENERATED OUTSIDE THE SERVICE AREA?	TREATMENT LEVEL	2020 VOLUMES (AFY)				
						WASTEWATER TREATED	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA[1]	RECYCLED OUTSIDE OF SERVICE AREA	INSTREAM FLOW PERMIT REQUIRE-MENT
WWTF	Pacific Ocean	1.5 miles	Ocean outfall	Yes	Secondary, Undisinfected	5,510	2,076			
WWTF	Various	Farmland	Other	Yes	Tertiary			103	3,331	
					TOTAL	5,510	2,076	103	3,331	0
None of the RWF's recycled water is claimed by any other urban water agency.										

TABLE 6-4: CURRENT AND PROJECTED RECYCLED WATER DIRECT BENEFICIAL USES WITHIN SERVICE AREA

NAME OF SUPPLIER PRODUCING (TREATING) THE RECYCLED WATER:	City of Watsonville							
NAME OF SUPPLIER OPERATING THE RECYCLED WATER DISTRIBUTION SYSTEM:	Pajaro Valley Water Management Agency							
SUPPLEMENTAL WATER ADDED IN 2020 (AFY)	729							
SOURCE OF 2020 SUPPLEMENTAL WATER	City of Watsonville							
BENEFICIAL USE TYPE	**DESCRIPTION OF 2020 USES**	**LEVEL OF TREATMENT**	**2020 (AFY)**	**2025 (AFY)**	**2030 (AFY)**	**2035 (AFY)**	**2040 (AFY)**	**2045 (AFY)**
Agricultural irrigation	Agricultural	Tertiary	3,434	4,000	4,000	4,000	4,000	4,000
		TOTAL	3,434	4,000	4,000	4,000	4,000	4,000
		2020 Internal Reuse	0					

TABLE 6-5: 2015 UWMP RECYCLED WATER USE PROJECTION COMPARED TO 2020 ACTUAL

BENEFICIAL USE TYPE	2015 PROJECTION FOR 2020 (AFY)	2020 ACTUAL USE (AFY)
Agricultural irrigation	4,000	3,434
TOTAL	4,000	3,434

The current design capacity of the RWF is 4,000 AFY and is dependent of current flows from the WWTF. There is sufficient demand to utilize all of the RWF's capacity. In order to increase flow, PV Water is investigating the following:

- Pilot testing alternative coagulant and flocculant chemical additions and/or adding an additional ultraviolet disinfection train, in order to reduce/eliminate recycled water production shutdowns due to poor effluent quality (not meeting Title 22 requirements)
- Reviewing and analyzing variable frequency drive (VFD) operations, in order to eliminate periodic pump failures.

DWR's Table 6-6 indicates that the City is not planning to expand the RWF, because the expansion of recycled water use is primarily attributable to PV Water and not to the City. More information on the RWF can be found on the PV Water web site at https://www.pvwater.org/recycled-water.

TABLE 6-6: METHODS TO EXPAND FUTURE RECYCLED WATER USE

☑	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.
6-10	Provide page location of narrative in UWMP

6.7 DESALINATED WATER

The City has explored desalination of wastewater, groundwater, or seawater. Desalination is considered cost-prohibitive and is not currently under consideration.

6.8 EXCHANGES OR TRANSFERS

Currently, the City has no plans to transfer or exchange water.

PV Water entered into an agreement for the assignment of 6,260 AFY of contracted Central Valley Project (CVP) water from the Mercy Springs Water District in November 1998. The agency has explored options to exercise this agreement through construction of a pipeline to link the Pajaro Valley with the San Felipe water system, but currently, this option is not being considered.

6.9 FUTURE WATER PROJECTS

New wells can be placed within the Pajaro Valley and would be located hydraulically upstream of the seawater intrusion areas in order to reduce impacts on the groundwater basin. The City is currently drilling a new well and intends to continue to drill wells over time, but only to maintain and replace aging wells, not to increase water supply (Table 6-7).

TABLE 6-7: EXPECTED FUTURE WATER SUPPLY PROJECTS OR PROGRAMS

☑	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table.

6.10 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

As shown in Table 6-8, the City's wells produced 7,102 AFY of water in 2020. No surface water was withdrawn.

TABLE 6-8: WATER SUPPLIES — ACTUAL

WATER SUPPLY	ACTUAL 2020 VOLUME (AFY)	WATER QUALITY
Groundwater (not desalinated)	7,102	Drinking Water
Surface water (not desalinated)	0	Drinking Water

The City's projected water supply rights are not expected to change, as shown in Table 6-9. The RWF is not connected to the general distribution system and is intended for agricultural purposes only. Because the recycled water is intended strictly for agricultural purposes, it is not included in the total water supply volume.

TABLE 6-9: WATER SUPPLIED — PROJECTED

WATER SUPPLY (AFY)	2025	2030	2035	2040	2045
Groundwater (not desalinated)	21,000	21,000	21,000	21,000	21,000
Surface water (not desalinated)	900	900	900	900	900
TOTAL	21,900	21,900	21,900	21,900	21,900

6.11 CLIMATE CHANGE IMPACTS TO SUPPLY

This section discusses the City's current understanding of the impacts of climate change on the quality and quantity of the City's surface water and groundwater sources.

6.11.1 SURFACE WATER

Climate change is widely expected to produce increased storm intensities. These storms, in turn, increase pollutant concentrations and sedimentation in surface water supplies. Intense storms can decrease surface storage of water because local reservoirs operate best with frequent, low-intensity rains. In addition, increased frequency and/or duration of drought events and warmer temperatures will reduce the quantity and quality of available surface water while increasing water demand.

6.11.2 GROUNDWATER

In coastal aquifers, as groundwater levels decrease, the pressure gradient between the saltwater and freshwater also changes. The lower the groundwater level becomes, the less pressure there is from freshwater within the aquifer to resist the intruding seawater. This process is illustrated in Figure 6-2.

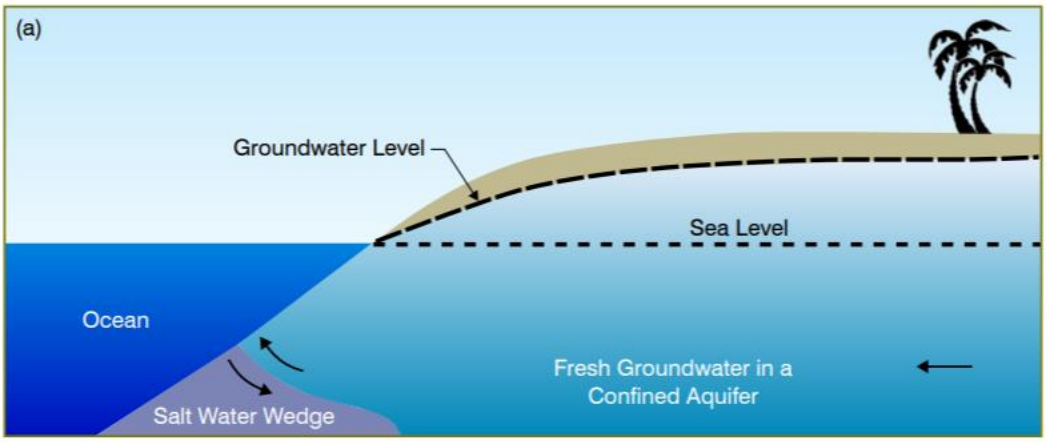
The California Ocean Protection Council prepares guidance to ensure that state and local governments use the best available science to incorporate climate change into decision-making processes. The latest guidance[6] predicts sea-level rise of 1.1 feet by 2050 and a range of 2.4–3.4 feet by the end of the century. Sea-level rise adds to the threat of seawater intrusion.

During a drought, the City can rely on groundwater for 100 percent of its supply. However, reduced precipitation and stream runoff associated with drought events inhibit groundwater recharge. Natural recharge has not been sufficient to maintain groundwater levels in the PV Subbasin, and therefore, groundwater has been recharged through "artificial" means. Artificial recharge captures and retains water in surface impoundments (dams, dikes, and infiltration areas) to allow water to percolate into the underlying basin.

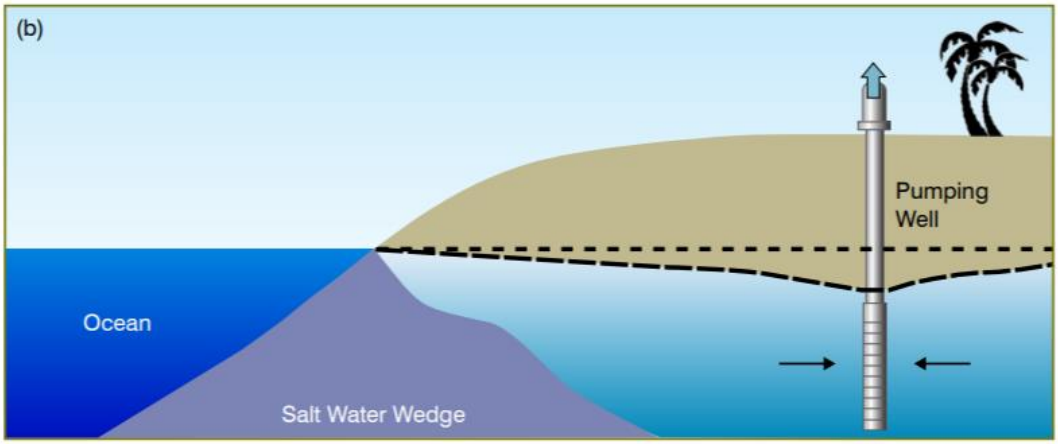
Additional overdraft in the Subbasin is expected to exacerbate seawater intrusion. Seawater intrusion is highly detrimental to water quality, causing chloride contamination of groundwater wells up to three miles inland. Elevated chloride concentrations can make the groundwater unusable for irrigating salt-sensitive crops and could require prohibitively expensive desalination treatment technologies for potable water.

[6] California Natural Resources Agency: California Ocean Protection Council, "State of California Sea Level Rise Guidance: 2018 Update."

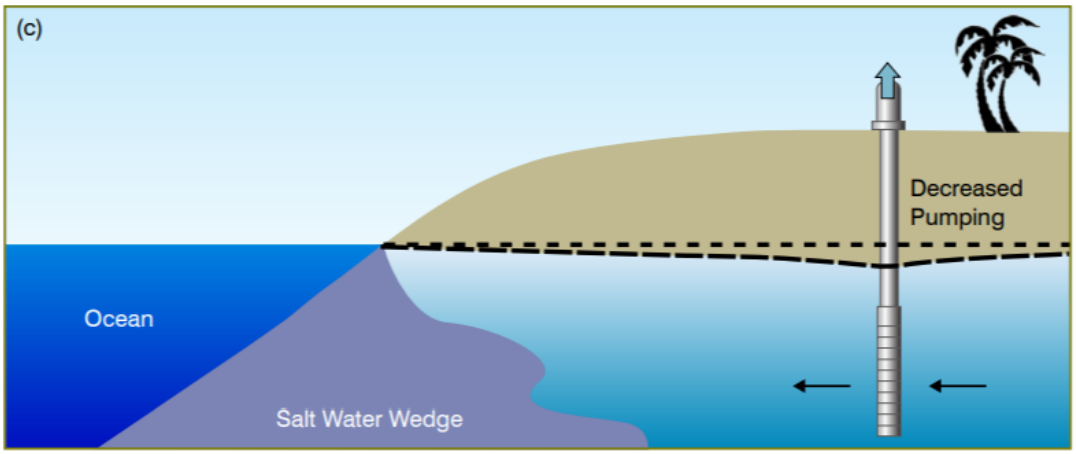
FIGURE 6-2: SEAWATER INTRUSION AND MITIGATION PROCESS (SOURCE: PV WATER 2014 BMP)



a) *Historic condition—Groundwater levels above sea level equilibrium level. No wells and no seawater intrusion.*



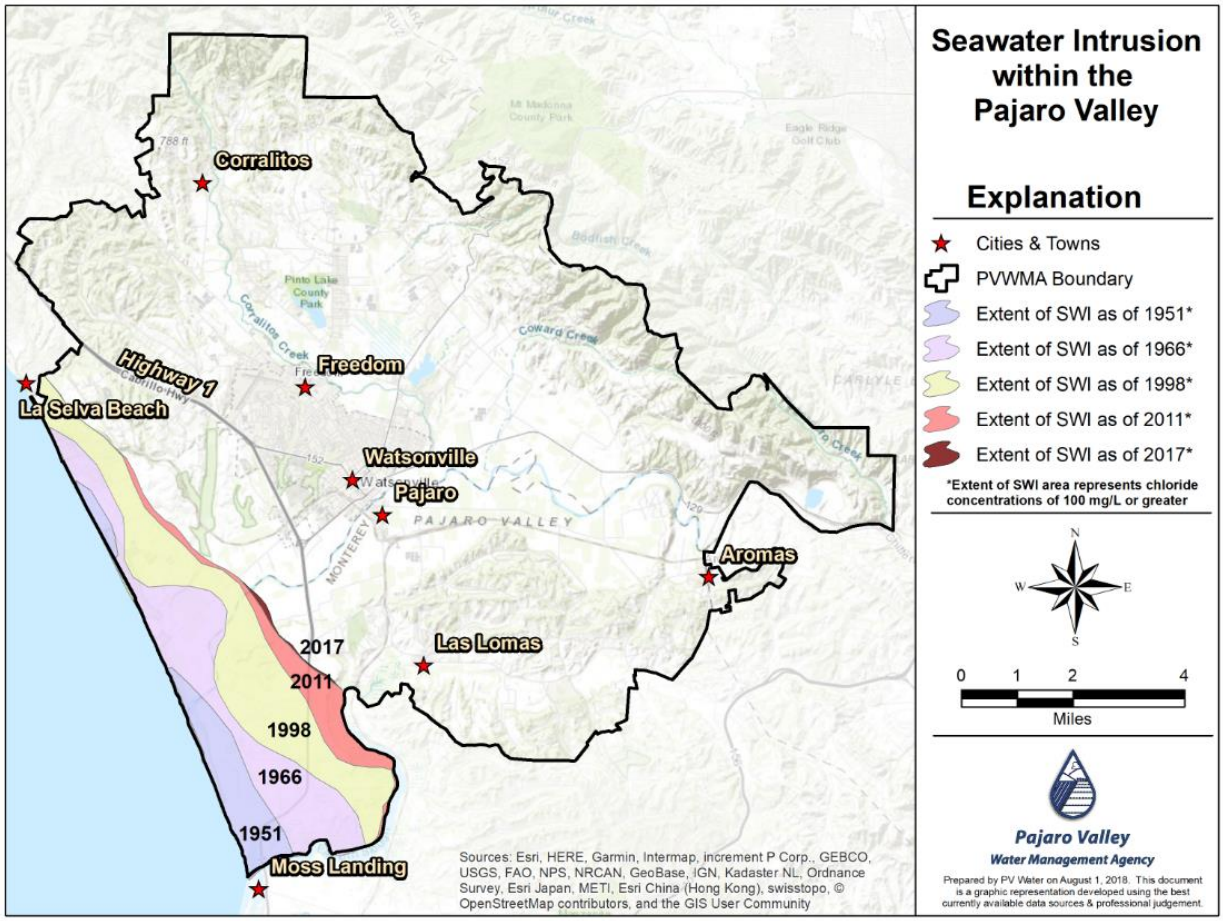
b) *Current stage—Excessive pumping results in long-term decreases in groundwater levels, pushing the salt water wedge closer to the pumping well trying to reach equilibrium.*



c) *Mitigation—Decreased pumping replenishes groundwater levels, increasing equilibrium pressure and pushing salt water wedge away from wells.*

While seawater intrusion is not currently an issue for the City, it continues to affect others in the Pajaro Valley (Figure 6-3). Without mitigation, it could become a concern for the City's future groundwater supply. The City will continue to support actions to mitigate negative impacts on the PV Subbasin.

FIGURE 6-3: SEAWATER INTRUSION IN THE PAJARO VALLEY (SOURCE: PV WATER IRWMP)



6.12 ENERGY USE

The City estimates that it used approximately 3,464,995 kilowatt-hours (kWh) of electricity in 2020 to extract, divert, store, treat, and distribute potable water. Some electricity meters cover multiple functions; however, a rough estimate of electricity used by function is provided in Table 6-10. Energy intensity by water delivery type is calculated in Table 6-11, showing similar energy use for retail and agricultural deliveries.

TABLE 6-10: ENERGY USE AND ENERGY INTENSITY BY FUNCTION

	EXTRACT AND DIVERT	PLACE INTO STORAGE	CONVEYANCE	TREATMENT	DISTRIBUTION	TOTAL UTILITY
Total Volume of Water Entering Process (AFY)	7,081	7,081	0	7,081	7,081	7,081
Energy Consumed (kWh)	981,176	139,609	0	1,160,580	1,183,630	3,464,995
ENERGY INTENSITY (KWH/AFY)	425.2	60.5	0.0	503.0	513.0	375.4

TABLE 6-11: ENERGY INTENSITY BY DELIVERY TYPE

WATER DELIVERY TYPE	TOTAL UTILITY (KWH/VOLUME)
Retail Potable Deliveries	375.4
Agricultural Deliveries	375.4
ALL WATER DELIVERY TYPES	375.4

This page intentionally left blank.

7 WATER SUPPLY RELIABILITY

This chapter compares historical and potential future constraints on water sources to projected water use. A number of scenarios are discussed in order to present the overall reliability of the City's water sources.

7.1 CONSTRAINTS ON WATER SOURCES

Based on water quality monitoring data ranging from 1990 to the present, there are no significant changes in the City's primary or secondary water quality standards. Overall groundwater quality is very good, and water quality objectives are achieved in all wells. With continued diligence, the City will continue to provide reliable water quality and water quantity. The City will strictly follow the requirements established by Federal and State regulatory agencies and ensure that it continues to deliver high-quality drinking water. City wells are not currently run at full capacity and can supply additional water when needed.

Surface water comprises zero to 10 percent of the City's total water supply. In the event of a drought or breakdown of the surface water filtration plant, such as occurred from 1989 through 1996, the City would depend more heavily on groundwater.

The City is able to supply its customers with adequate water through several years of drought. However, during drought conditions, the City also implements stricter water conservation measures.

The State of California has set a Maximum Contaminant Level (MCL) for total chromium of 50 parts per billion (ppb). The City meets this MCL. In 2014, the State proposed a reduced level of 10 ppb for hexavalent chromium, also known as chromium-6. Six of the City's wells have chromium-6 levels slightly above 10 ppb with an average of 8.5 ppb among all wells. The City engaged with consultants and engineers to identify the most appropriate treatment technology for the chromium-6 impacted wells. In 2017, the Superior Court of Sacramento County issued a judgment invalidating the State's chromium-6 MCL for drinking water, ruling that the State failed to comply with the Safe Drinking Water Act's requirement to consider economic feasibility. The State is in the process of developing a new MCL. The City is prepared to ensure that each of its impacted sources meets the required treatment levels within the compliance period.

Further water quality information can be found in the 2019 Consumer Confidence Report, Appendix 7-1.

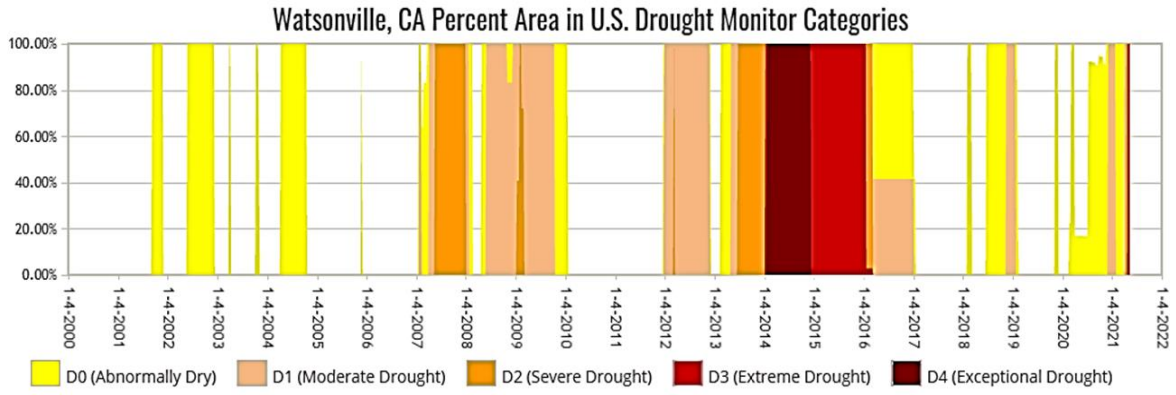
7.2 RELIABILITY BY TYPE OF YEAR

Appendix 7-2 provides annual (calendar year) precipitation data for the Watsonville Waterworks Freedom weather station USC00049464. Thirty years of data were analyzed. Average annual precipitation over the period was 22.88 inches per year. The year closest to

the average was 2014, with 23.24 inches of rain. The single driest year in the record was 2013, with 3.54 inches of rain.[1] The driest five-year stretch was 2012–2016, with an annual average of 18.35 inches per year.

The U.S. Drought Monitor also provides graphic detail of past droughts. As shown in Figure 7-1, Watsonville experienced a three-year drought from 2007 to 2009 and a five-year drought from 2012 to 2016. The Drought Monitor indicates that 2014 was extreme drought; depending on whether a calendar or fiscal year is used, the driest year varies between 2013 and 2014.

FIGURE 7-1: U.S. DROUGHT MONITOR — HISTORICAL DROUGHTS



Source: The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Graphic courtesy of NDMC. https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx

This data was utilized to fill in the Base Year column in Table 7-1. The "Volume Available" column provides the amount of potable water demand by year, and the "Percent of Average Supply" shows how much water was used during droughts compared to the "Average Year" of 2014. For each year, volume supplied is compared to the average year to illuminate changing water usage in dry years. Water use in the Single Dry Year of 2013 was 111 percent higher than the average year. The City's total water right of 22,000 AFY is more than sufficient to cover any shortfalls (Tables 7-2 through 7-4). However, it is likely that in a five-year drought, the City would not want to withdraw its entire water right as that could negatively affect water quality for other users, and possibly for the City, due to the potential for brackish water and/or lower groundwater levels.

Historically, the City used a maximum of 40 percent of its water rights in the single driest year of 2013 (Table 7-1), which was also the second year of the five-year drought. Under

[1] Historically, the City's operation staff refers to the rain year as July 1 thru June 30. To enable comparison to water demand in dry years, however, the UWMP considers the rain year to be January 1 thru December 31, and thus utilizes calendar year precipitation data. This change in period affects which years are considered "driest." Under the calendar year period, 2013 is the driest year; under the July 1 to June 30 period, 2014 is the driest year.

similar circumstances, the City can provide reliable water supplies not only under normal conditions but also under both the Single-Dry Year and Five Consecutive Dry Year events.

TABLE 7-1: BASIS OF WATER YEAR DATA

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLIES IF YEAR TYPE REPEATS	
		VOLUME AVAILABLE (AFY)	% OF AVERAGE SUPPLY
Average Year	2014	7,506	100%
Single-Dry Year	2013	8,318	111%
Consecutive Dry Years 1st Year	2012	7,770	104%
Consecutive Dry Years 2nd Year	2013	8,318	111%
Consecutive Dry Years 3rd Year	2014	7,506	100%
Consecutive Dry Years 4th Year	2015	6,874	92%
Consecutive Dry Years 5th Year	2016	6,349	85%

7.3 SUPPLY AND DEMAND ASSESSMENT

Table 7-2 compares projected "normal" demand from Table 4-3 to projected supply for 2025–2045, in five-year increments. Table 7-3 scales up the normal usage by 111 percent usage for a Single-Dry Year to the projected normal usage rates in Table 7-2. Table 7-4 utilizes the same methodology. In all examples, water usage does not exceed the City's groundwater rights. However, in 2045, Table 7-4 shows an estimated 9,940 AFY, which is 13 percent more than the highest year in recent history.[2] High water demand is of concern, as will be discussed in Section 7.4 below.

TABLE 7-2: NORMAL YEAR SUPPLY AND DEMAND COMPARISON (AFY)

	2025	2030	2035	2040	2045
Supply totals	21,900	21,900	21,900	21,900	21,900
Demand totals	7,827	8,023	8,224	8,375	8,504
Difference	14,073	13,877	13,676	13,525	13,396

TABLE 7-3: SINGLE DRY YEAR SUPPLY AND DEMAND COMPARISON (AFY)

	2025	2030	2035	2040	2045
Supply totals	21,900	21,900	21,900	21,900	21,900
Demand totals	8,688	8,906	9,128	9,296	9,440
Difference	13,212	12,994	12,772	12,604	12,460

[2] The increase in 2045 accounts for estimated population increases. It should also be noted that these water demand estimates include agricultural use and water losses.

TABLE 7-4: MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON (AFY)

		2025	2030	2035	2040	2045
First year	Supply totals	21,900	21,900	21,900	21,900	21,900
	Demand totals	8,140	8,344	8,553	8,710	8,845
	Difference	13,760	13,556	13,347	13,190	13,055
Second year	Supply totals	21,000	21,000	21,000	21,000	21,000
	Demand totals	8,688	8,906	9,128	9,296	9,440
	Difference	13,212	12,994	12,772	12,604	12,460
Third year	Supply totals	21,000	21,000	21,000	21,000	21,000
	Demand totals	7,827	8,023	8,224	8,375	8,504
	Difference	14,073	13,877	13,676	13,525	13,396
Fourth year	Supply totals	21,000	21,000	21,000	21,000	21,000
	Demand totals	7,201	7,381	7,566	7,705	7,824
	Difference	14,699	14,519	14,334	14,195	14,076
Fifth year	Supply totals	21,000	21,000	21,000	21,000	21,000
	Demand totals	6,653	6,820	6,990	7,118	7,229
	Difference	15,247	15,080	14,910	14,782	14,671

7.4 DROUGHT RISK ASSESSMENT

During prolonged drought, it is likely that the City would have to rely on groundwater. Surface water supply has typically not been available by the second year of a drought. Table 7-5 assumes that the next five years are a five-consecutive-year drought, calculates potential usage, and shows the benefits of conservation during droughts.

To develop the numbers, water demand during the most recent three-year (2007–2009) and five-year (2012–2016) drought periods were reviewed, as shown in Appendix 7-3. Water usage increased more dramatically in the three-year drought; thus, it is included in this assessment in order to provide a more stringent planning scenario.

During the first three years of the droughts, water demand **increased** an average of 9.3 percent in the first year of the drought, 14.1 percent in the second year, and 1.7 percent in the third year. For the five-year drought, water demand **decreased** 8.4 percent and 15.4 percent in years four and five, respectively. These declines are assumed to be due to adoption of water shortage measures.

Table 7-5 below provides a base case for the impact of a drought on water supplies. The highest projected water use under this assessment is 8,799 AFY in 2022. The City's water use in 2013, the Single Dry Year, was 8,318 AFY. Thus, this assessment predicts an increase in water demand of 481 AFY over the Single Dry Year.

TABLE 7-5: FIVE-YEAR DROUGHT RISK ASSESSMENT, BASE CASE

	2021	2022	2023	2024	2025
Total Water Use	7,674	7,712	7,750	7,789	7,827
Total Supplies	21,000	21,000	21,000	21,000	21,000
Surplus/Shortfall w/o WSCP Action	13,326	13,288	13,250	13,211	13,173
WSCP – use reduction savings benefit	-714	-1,087	-132	654	1,205
Total Projected Water Use in Drought	**8,388**	**8,799**	**7,882**	**7,135**	**6,622**
Revised Surplus/(shortfall)	12,612	12,201	13,118	13,865	14,378
Resulting % Use Reduction from WSCP action	-9%	-14%	-2%	8%	15%

Table 7-5 would appear to indicate that the City's total water rights of 21,000 AFY are available for groundwater withdrawal. However, water rights do not guarantee water availability. It is expected that there is more than sufficient groundwater to support the City. However, excessive withdrawals by all users are likely to increase saltwater intrusion and negatively impact agriculture in the region. It is important to note that the City only uses 14% of the groundwater in the basin, and that more significant conservation measures by all user, including agricultural partners, will be required to ensure water quality is protected in the basin.

Thus, the City continually reviews water use, works with the community directly to educate and understand water demand (as discussed further in Chapter 9), and pursues resource maximization tools for the management and operation of the water utility. The City's main emphasis is in water conservation. City coordination with the PVWMA on the BMP is aimed at reducing groundwater overdraft.

Droughts are expected to continue to occur and perhaps intensify. Groundwater levels are expected to decline during droughts and increase during wet years. Based on the region's recent history, the City's groundwater levels have recovered after droughts, though seawater intrusion is still occurring outside the City's Water Service Area.

Due to the possibility that droughts will intensify, and the current drought that the region is experiencing, the City will need to redouble its efforts to promote conservation measures to ensure they are adopted early and are widespread in the community.

This page intentionally left blank.

8 WATER SHORTAGE CONTINGENCY PLAN

A water shortage may occur due to a number of reasons, such as population growth, climate change, drought, and catastrophic events. A water shortage means that the water supply available is insufficient to meet the normally expected water use at a given point in time. Drought, regulatory action constraints, and natural and man-made disasters may occur at any time. The WSCP is Watsonville's operating manual to prevent catastrophic service disruptions through proactive, rather than reactive, management. This way, if and when shortage conditions arise, the WSCP allows the City Council, City staff, and the public to identify and implement pre-determined steps to manage a water shortage.

This chapter contains a summary of the City of Watsonville's Water Shortage Contingency Plan (WSCP). The full WSCP is included as Appendix 8-1.

8.1 GUIDING PRINCIPLES

The WSCP was prepared in accordance with the following guiding principles:

- Shared contribution: All customers will share the burden of reducing water use.
- Meet basic health and safety needs: Highest priority given to essential uses.
- Prioritize reducing nonessential water uses: Focus on eliminating outdoor water and other non-essential uses.
- Minimize economic impacts to businesses: Minimize actions that would have a substantial impact on the local economy.
- Communication at every level to ensure customer response and confidence.

Previously, the WSCP was included as part of the UWMP. California Water Code (CWC) now requires that the WSCP be a stand-alone plan that can be updated at any time, outside of the UWMP Update process.

8.2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

The City will prepare an Annual Water Shortage Assessment Report (Annual Assessment) of water demand and supply, which must be submitted to the California Department of Water Resources each year. The Annual Assessment will include at a minimum the current year and one dry year; that is, it will assume that the next year will be a dry year. Additional information/assumptions to be included are:

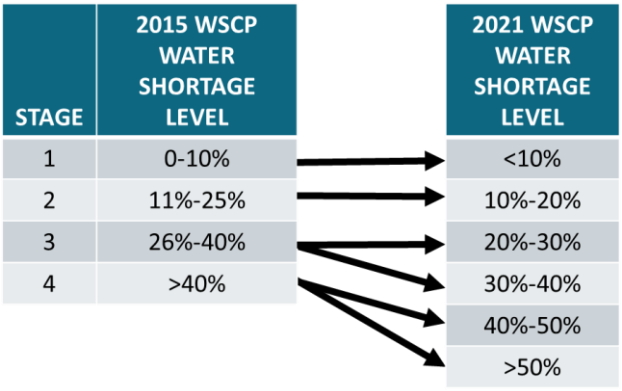
- Locally applicable evaluation criteria
- Description of water supply
- Quantification of water supply – current year supply and one dry year supply
- Customer water demand – current year unconstrained demand and one dry year
- Existing infrastructure capabilities and plausible constraints (e.g., anticipated capital projects and/or repairs that may constrain supplies or add capacity).

8.3 SIX STANDARD WATER SHORTAGE STAGES

California Water Code requires that urban water suppliers define six stages of water supply shortage levels: up to 10 percent, 10–20 percent, 20–30 percent, 30–40 percent, 40–50 percent, and greater than 50 percent shortage. Per the Urban Water Management Plan Guidebook of 2020 (Guidebook), the shortage levels were standardized "to provide a consistent regional and statewide approach to convey the relative severity of water supply shortage conditions."

The Water Code further allows that an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement by developing and including a cross-reference relating existing water shortage levels to the newly established six standard water shortage levels. The City's 2015 WSCP defined four stages of water supply shortage. These have been cross-referenced to the six stages of water supply, as shown in Figure 8-1.

FIGURE 8-1: WATER SHORTAGE LEVELS, 2015 AND CURRENT WSCP CROSS REFERENCE



The water shortage level will be determined based on supply conditions, including changes in groundwater levels or voluntary or mandatory conservation measures implemented by the State of California. Table 8-1 identifies WSCP Shortage Response Actions that will result from the corresponding level of Water Shortage.

TABLE 8-1: WATER SHORTAGE CONTINGENCY PLAN LEVELS

SHORTAGE LEVEL	PERCENT SHORTAGE RANGE	STAGE LEVEL	SHORTAGE RESPONSE ACTIONS
1	Up to 10%	1	Implement Stage 1 Water Shortage Contingency Plan
2	Up to 20%	2	Implement Stage 2 Water Shortage Contingency Plan
3	Up to 30%	3	Implement Stage 3 Water Shortage Contingency Plan
4	Up to 40%	3	Implement/Continue Stage 3 Water Shortage Contingency Plan
5	Up to 50%	4	Implement Stage 4 Water Shortage Contingency Plan
6	>50%	4	Implement/Continue Stage 4 Water Shortage Contingency Plan

Demand reduction actions that will be implemented for each Stage Level are discussed below.

Stage 1: Up to 10 Percent Water Shortage

During shortages of up to 10 percent, the City will take the following actions:

- Expand existing efforts to promote conservation – intensify water conservation public information and outreach programs.
- Allocate additional funds to water conservation staffing, rebates, and outreach programs.
- Stepped up enforcement of landscape water use per the MWELO and previously approved water allowances.
- Reduce potable water supplement to reused water by 25 percent.

Stage 2: 10 to 20 Percent Water Shortage

Stage 2 includes all Stage 1 actions and initiates several mandatory water use restrictions and requirements:

- Washing paved or hard surfaces is prohibited, except by bucket or to prepare a surface for painting, to maintain solar panels, or for health and safety reasons.
- At-home vehicle washing is prohibited, except by bucket.
- Watering or irrigating landscapes is restricted as follows:
  - Prohibited between 9:00 a.m. and 5:00 p.m. (except by bucket or hand-held hose with shut-off nozzle).
  - Allowed only two days per week as scheduled and posted by the City.
  - Prohibited for more than 15 minutes per allowed day and method (except for drip irrigation).
- Using potable water to fill decorative water features is prohibited, except to sustain aquatic life.
- Draining and refilling of private swimming pools is prohibited, unless necessary for health and safety or leak repair.
- Constructing or installing and operating new commercial car washes and commercial laundry systems that do not use water-recirculating technologies is prohibited.
- Irrigation of landscaping on street medians and narrow strips in and alongside of public streets is prohibited.
- Using potable water for construction needs is prohibited when recycled water is readily available.
- Water-conserving dishwashing spray valves are required in restaurants and other commercial kitchens.
- Hotels must offer guests the option to reuse sheets and towels.
- Water use in training exercises is prohibited.
- Customers are required to repair broken or defective water systems within five days.
- Reduce potable water supplement to reused water by 50 percent.

As an alternative to the restrictions limiting irrigation days and duration, large landscape customers may instead limit irrigation to a set percentage of their water budget, as determined by the City based on the severity of the water shortage.

Stage 3: 20 to 40 Percent Water Shortage

Stage 3 includes all Stage 1 and Stage 2 actions plus the following additional restrictions:

- Landscape watering is limited to one day per week for 15 minutes (includes all types of irrigation, including sprinkler, drip, and hand watering).
- Irrigation of public parks, public buildings, and playing fields, including school grounds, is prohibited.
- Using potable water to fill swimming pools and spas is prohibited.
- Repair of leaks and malfunctions in customer's water system is required within 48 hours.
- Allows for implementation of water rationing if target reduction is not met.
- Additional staff may be hired to address outreach enforcement and leak repair.
- Reduce potable water supplement to reused water by 75 percent.

Stage 4: Greater than 40 Percent Water Shortage

Stage 4 includes all Stage 1, Stage 2, and Stage 3 actions, plus the following additional restrictions:

- Prohibits irrigation of any landscape except for fire prevention, erosion control, or environmental mitigation.
- Mandates a water rationing system with financial penalties for violations.
- Prohibits all home vehicle washing, including bucket method.
- Requires repair of broken or defective customer water systems within 24 hours.
- The City may intensify restrictions in previous stages or add new restrictions.
- No letters of water availability will be issued by the building department.
- Cease all potable water supplements to reused water.

In a severe water shortage, the City may implement mandatory restrictions. The City may also change the Demand Reduction Actions as necessary to address water supply shortages.

8.4 COMMUNICATION PROTOCOLS

External communications related to the WSCP are generally done for the following reasons:

1. General – educational, financial, regulatory, etc.
2. A change in water shortage level (Current Shortage) or a statewide emergency conservation requirement
3. An expected future water shortage level (Predicted Shortage)
4. Emergency (e.g., a sudden drop in water supplies/water pressure)

Expected communications approaches that will be used for each category of communications are listed in Table 8-2.

TABLE 8-2: COMMUNICATION PROTOCOLS

	GENERAL	CURRENT SHORTAGE-CHANGE IN SHORTAGE LEVEL	CURRENT SHORTAGE-CHANGE IN STAGE LEVEL	PREDICTED SHORTAGE	EMERGENCY
Social Media and City Web Site	✓	✓	✓	✓	✓
Sandwich Boards and Electric Signage in Affected Neighborhoods					✓
Press Release (Radio, Television, and Newspaper)			✓	✓	✓
Bill Inserts	✓	TBD	✓	✓	
Written and Phone Alerts to PV Water			✓	✓	✓
Written Alert to State and Local Government, if required	✓	✓	✓	✓	✓
Community Center/School Outreach/Field Trips	✓	✓	✓	✓	✓
Community Events/Festivals	✓	✓	✓	✓	✓

Each change in Water Stage Level (that is, from Stage 1 to Stage 2) will precipitate a new round of communications to alert customers and other affected parties of current or predicted water shortages. A change in Water Shortage Level will likely require state notification. To avoid confusion, the public may not be notified of a change in Water Shortage Level unless the Water Stage Level also changes. Additional communications may occur as appropriate.

When a communication alert is triggered by a Current Shortage or Predicted Shortage, the Public Works Director shall initiate and ensure completion of the appropriate communications.

This page intentionally left blank.

9 WATER CONSERVATION/DEMAND MANAGEMENT MEASURES

The City recognizes the importance of water conservation and is committed to promoting and practicing the sustainable use of water resources. The City demonstrates this commitment through English/Spanish bilingual outreach and educational programs, financial incentive programs, and implementation of water conservation at City properties. The City also participates in regional water conservation planning and outreach programs. The following sections outline the City's specific efforts to reduce current demand and conserve water resources for the future.

9.1 EXISTING AND PLANNED DEMAND MANAGEMENT MEASURES

9.1.1 WATER EFFICIENCY AND WASTE PREVENTION ORDINANCES

The City of Watsonville has adopted several ordinances that support water conservation by prohibiting water waste, including:

Wasting of Water
Under City Code 6-3.432**:**

> *It is unlawful for any person to use water for any of the following:*
>
> *a) Watering of grass, lawn, ground cover, shrubbery, open ground, crops, trees, including agricultural irrigation, or an indiscriminate running of water or washing with water in a manner or to an extent which allows water to run to waste;*
>
> *b) Permit the loss of water through leaks, breaks, or malfunction within the customer's plumbing;*
>
> *c) The use of a hose without a quick-acting positive shut-off nozzle;*
>
> *d) Maintenance or operation of any new ornamental fountain which does not recirculate 100 percent of water used;*
>
> *e) Operation of a new car wash that does not use the best available water conservation technology;*
>
> f) *Irrigation of turf, lawns, gardens or ornamental landscaping between 9:00 a.m. and 5:00 p.m., except by drip irrigation or hand watering with a quick-acting shut-off nozzle. (§ 1, Ord. 1088-00 C-M, eff. April 14, 2000)*

Landscape Irrigation Systems
The Watsonville City Council adopted the Model Water Efficient Landscape Ordinance (MWELO) in 2015. It has been permanently incorporated into the Watsonville Municipal Code. The ordinance includes water use restrictions focused on reducing water use in new development and major remodels. The MWELO requires City approval of landscape plans prior to issuance to building permits and also requires post-construction inspections. This ordinance applies to projects requiring a planning-level permit that contain over 500 square

feet of new or rehabilitated landscape areas. The MWELO reduces the size of turf areas in residential projects and prohibits turf in commercial projects. It also requires the use of highly efficient irrigation methods and is predicted to reduce landscape water use in new projects by 30 percent or more. The Watsonville Municipal Code also requires that existing irrigation systems be maintained to avoid run-off, over-spray, low head drainage, or other similar conditions where water flows to waste. Over the last five years, nine landscape plans have been reviewed and approved for MWELO compliance.

Irrigation Efficiency Action Plans

The City focuses its efforts on public education programs to promote water conservation activities, while reminding customers of the City's ordinances, and will enforce the codes when necessary. The City's licensed landscape irrigation specialist will first meet with each business to create an Irrigation Efficiency Action Plan to address the water waste violations. Failure to complete the tasks according to the code compliance schedule of the Irrigation Efficiency Action Plan may result in fines and/or a rate increase if water waste from the property is observed and documented. Over the last five years, 10 action plans have been completed to require businesses who are chronically wasting water to demonstrate and implement corrective actions.

Plumbing Retrofit Water Conservation Certificate Program

In January 2017, the City of Watsonville updated its water conservation program to better protect the City's water resources, reduce consumption, and follow the requirements of State Bill 407. This update applies to properties located within the City of Watsonville and those in unincorporated Santa Cruz County that are supplied water by the City of Watsonville. All properties at the time of sale must retrofit water fixtures that do not meet high efficiency standards. At the time of sale, sellers must complete a Water Conservation Certificate for Property Transfers form, or alternatively, buyers may complete the Transfer of Responsibility to Retrofit form (Appendices 9-1 and 9-2). The City receives approximately 60 certification forms per year.

City of Watsonville Green Building Code

The City follows the California Green Business Code, which sets standards for improved energy efficiency, water conservation, indoor environmental quality, and waste reduction.

9.1.2 METERING

The City is fully metered for all customer sectors, including separate meters for single-family and multi-family residential, commercial, large landscapes, and all institutional/ governmental facilities. Metering is an effective conservation measure that directly associates cost with the amount of water used. It also provides the means for the City to identify and monitor high-use customers. In addition, all fire services are metered, contractors are provided with hydrant meters, and the water refill station is also metered.

The City will continue to install and read meters on all new services. To help ensure that the water is metered correctly, the City has a proactive meter calibration and replacement program. Small meters (one inch or less) are replaced at 20-year intervals. Large meters (one and a half inches and greater) are replaced at 15 year intervals. Meter installation costs are part of new service connection fees. From 2016 through 2020, the City of Watsonville has replaced 4,135 water meters, with 244 meters outstanding (pandemic related) to be replaced, and has scheduled to replace 2,208 meters over the next five years. The replacement rate over the next five years is shown in Table 9-1 below:

TABLE 9-1: METER REPLACEMENT PLAN

EXPECTED METER REPLACEMENTS 2021–2026	
METER SIZE	**# OF METERS**
5/8 inch and 3/4 inch	974
1 inch	1,045
1.5 inch–2 inch	189

Periodic reviews of customer water use are done to evaluate the effectiveness of this measure, comparing current water use with historic data. Meters three inches and larger are tested annually (no meter testing was performed in 2020 due to the pandemic) and replaced as appropriate.

9.1.3 CONSERVATION PRICING – TIERED RATE STRUCTURE

The City uses a tiered rate structure for single-family accounts, based on the varying costs to produce water across the system. Commercial and other non-residential water accounts are billed by the volume of water used at a uniformed rate. A copy of the rate structure (adopted 5/25/2021) is provided in Appendix 9-3. Water rates consist of a monthly fixed service charge and a commodity charge. The fixed service charge pays for fixed costs of operating and maintaining the water system. The costs do not change based on the amount of water used by customers. The commodity charge is split into three tiers for residential customers and increases as customer water use exceeds the designated tier thresholds.

9.1.4 PUBLIC EDUCATION AND OUTREACH

The City's Environmental Outreach Team provides bilingual programming to the city's diverse population. Water conservation education and outreach are top priorities of the Outreach Team given the groundwater overdraft and saltwater intrusion in the region.

The following is a list of tools used to provide information to the public and, where available, the frequency of use/posting of tools.

- City website: 300 annual views of web pages on Water Division, Conservation Resources, Report a Leak, Water Efficient Plumbing pages.
- Social Media: City of Watsonville Facebook and Instagram; five posts on specific water conservation resources and facts with community engagement annually.

- Bilingual water conservation flyers and at least two articles included in the utility bills and "Our Town" monthly newsletter are published and mailed out to 20,000 customers annually. Specific water conservation topics include rebates for toilets, washers, and lawn conversion, as well as free distribution of water conservation devices. Promotion of rain barrel rebates provided by Pajaro Valley Water are also included.
- Billing Inserts:
    - Annually, flyers are included in 20,000 customer bills on specific water conservation topics, such as rebates for toilets, washers, and lawn conversion, as well as free distribution of water conservation devices.
    - Pajaro Valley Water regularly provides promotion flyers for rain barrel rebates.
    - Bi-annually, water conservation articles are included with customer bills.
    - Conservation articles and notices of conservation rebates are also included in the City's "Our Town" newsletter included with the customer bills.
- Brochure racks at City facilities with information on Watsonville's Water System, water conservation consultation, lawn rebate, and conservation tips.
- Water rebate information to local retailers, including hardware stores and nurseries.
- Newspaper advertisements and feature stories in the local English and Spanish publications.
- Annual appearance at local events: Earth Day/Day of the Child and Santa Cruz County Fair reach several thousand residents per year.
- Financial support to Green Business Program, Green Gardener Program, and Watersmart Garden web tool with regional partners.

The City offers bilingual programs, materials, and financial incentives to encourage conservation. Providing these tools along with information and inspiration is what leads to a change in behavior in conservation. Programs include:

- Every year, the Outreach Conservation team has been reaching over 3,000 residents through the Watsonville Nature Center, discussing water conservation practices, and providing free conservation devices and "Lose Your Lawn" and toilet rebates.
- Ongoing presentations to hundreds of community members are offered annually by the City's Bilingual Community Outreach Coordinator. Participants receive tips and free conservation resources to help conserve water and save money while learning where Watsonville's water comes from and about the City's tap water safety.
- The City's Environmental Education Coordinator provides virtual, classroom-based, and in-person field trips and presentations to hundreds of intermediate-aged Watsonville students each year. Topics covered are local groundwater and surface water works and water conservation behaviors.
- *Funding Green Gardener Training* with regional partners (not done in 2020 due to Covid): The City provides cost-share funding, along with regional partners, for the Monterey Bay Green Gardener Certification Program, a 10-week series of ecological landscaping classes offered in Spanish and English at the Watsonville/Aptos Adult School. Classes include water-wise plant selection,

efficient irrigation system design and management, soil health, and LID strategies for stormwater management. In addition, the City financially sponsors annual "Lose Your Lawn" workshops for the general public. The workshops draw in about 50 residents each year and result in a lawn conversion/Monterey Bay Friendly Landscaping demonstration project at a City Park.

- *Landscape Audit Consultation Program:* The City offers free water audits for residential customers and commercial customers through its Landscape Consultation Program. A licensed landscape irrigation specialist is sent to the property to assess water usage, identify leaks or breaks, re-program irrigation controllers, and make recommendations for specific repairs or retrofits. The customer is also referred to the Water Smart Gardening web-based tool for low-water landscape design ideas. The online tool was developed for Watsonville's climate and includes only plants that thrive here with minimal water. It also provides technical assistance on irrigation systems and soil issues, as well as local resources, including retailers, classes, and contact information for certified Green Gardeners. To identify the top water users in all customer categories, the City performs an annual evaluation of the water usage by customer account. Customers with high usage are offered the free Landscape Consultation, landscape water conservation program rebate information, and certified Green Gardeners contact information.
- *High-Efficiency Clothes Washers Rebates:* Customers who purchase qualifying high-efficiency clothes washers can receive a City rebate of $100. This program includes washers in laundry rooms of apartment complexes and other high-use locations. Over the last five years, 362 rebates were issued to replace washers. City staff have observed a market saturation with a decrease in demand for this program, and the rebate may no longer be necessary as the price gap between an Energy Star and Non-Energy Star Clothes Washers is now minimal.
- *Free Showerheads, Hose Nozzles, Faucet Aerators, and Shower Timers:* These devices are offered during the Landscape Water Consultation and at the City's Nature Center. In both programs, staff ensures that devices meet the customer's need with a high likelihood of effective usage. The Watsonville Nature Center provided an average of 654 low-flow showerheads, aerators, and hose nozzles on an annual basis over the last five years, saving an estimated minimum of 2.5 million gallons of water.
- *DWR Grant Collaborations:* In addition to offering free water-saving devices through the Nature Center, the City partnered with Ecology Action to implement a Department of Water Resources Water/Energy Grant in 2017/18 to complete direct installation of water conservation measures at residential and commercial food service properties in disadvantaged community census tracts. This program

served 1,482 properties in the City's service area and reduced water demand by 28.9 million gallons annually. A summary of results from this project is below.

- Canvassed 3,637 single-family homes and offered direct installation services to 117 multi-family residential properties.
- Installed 1.5 gpm showerheads, 1 gpm bathroom faucet aerators, and 1.5 gpm kitchen aerators in 1,258 homes, including 26 home day care businesses.
- Upgraded 42 residential clothes washers and 14 residential dishwashers to Energy Star most-efficient models.
- Upgraded 32 multi-family commercial clothes washers to Energy Star most-efficient models.
- Fixed nine egregious leaks wasting more than 24 gallons/day.
- Referred residents to City toilet replacement and landscape efficiency rebate programs.
- Offered direct installation services to 226 commercial kitchens and installed low-flow, pre-rinse spray nozzles and faucet aerators at 103 restaurants, grocery stores, and PVUSD cafeterias.
- Upgraded six commercial dishwashers to Energy Star models.
- Referred businesses to utility rebate programs and local green business programs.

Estimated savings are shown in Table 9-2.

TABLE 9-2: DWR GRANT COLLABORATION, ESTIMATED RESULTS

DIRECT IMPLEMENTATION MEASURE	ANNUAL SAVINGS (CA AIR RESOURCE BOARD 2016 WATER-ENERGY CALCULATOR)			
	ELECTRICITY SAVINGS (KWH)	THERMS SAVINGS	WATER SAVINGS (GALLONS)	GHG EMISSIONS REDUCTION (MT CO_2E)
Commercial pre-rinse spray valve (0.92 GPM)	-	11,960	1,485,696	64
Commercial kitchen aerators (1.5 GPM)	-	75,547	9,418,752	401
Commercial bathroom aerators (0.5 GPM)	-	10,216	1,745,671	54
6 Commercial ENERGY STAR dish machines	-	3,570	416,505	19
Commercial ENERGY STAR clothes washers (laundromat)	-	-	-	-
1,315 Residential showerheads (1.5 GPM)	-	33,287	4,430,446	177
1,652 Residential bathroom aerators (1 GPM)	-	26,498	3,526,885	141
816 Residential kitchen aerators (1.5 GPM)	-	34,792	4,630,773	185
14 ENERGY STAR single-family residential dishwashers	566	41	9,675	0
42 ENERGY STAR single-family residential clothes washers	3,599	3,443	858,987	19
32 ENERGY STAR multi-family residential clothes washers	10,985	6,612	2,320,429	39
9 Faucet leak repairs	-	491	84,376	3
TOTAL ANNUAL PERFORMANCE SAVINGS	15,151	206,457	28,928,195	1,101

- *Toilet Rebates and Retrofits*: Over the last five years, the City has offered rebates to all customers that install high-efficiency toilets that replace toilets using more than 1.6 gallons per flush. The City picks up the old toilet to ensure that it qualifies for the rebate and also to ensure it does not get re-installed at any location. The rebate amount is $100. Over the last five years, 329 toilet rebates were provided. In the last two years, the City has seen a decline in demand for this program, and therefore, it will be discontinued moving forward.
- The City has also been sponsoring a direct-install toilet replacement program in partnership with Central Coast Energy Services. The City's toilet rebate and toilet replacement programs are available to all customers, and there is not a limit on the number of toilets per location. The toilet rebate and toilet replacement programs do not have income restrictions. Over the last five years, 76 toilets were replaced through this program. This program will continue and will target underserved residents, ensuring that low-income households do not experience financial barriers to water savings due to the cost of installation by a licensed plumbing contractor.
- *Coordination with Local Retailers:* The City ensures that the toilet and washer rebate information is available at the point of sale. City staff meets with staff at local retailers such as Home Depot, Orchard Supply, K-Mart, and Ace Hardware to provide "shelf talkers" and rebate applications and update store employees on new water conservation programs. This component of the rebate program will most likely get modified to fit new conservation rebates offered by the City.
- *Landscape Water Conservation Rebate:* Since 2014, the City has been offering a $0.75 per square foot rebate for customers to replace high water use lawns with drought-tolerant, permeable landscaping. Residential customers are eligible for a maximum rebate of up to $500, and multi-family, commercial, or institutional customers are eligible for a maximum rebate of $1,000. The City plans on increasing the rebate to $1.00 per square foot with the same limitations of rebating up to 1,000 square feet for single-family residences and 5,000 square feet for multi-family and commercial. The City hopes to encourage more lawn conversions by offering a higher rebate. Over the last five years, 297 residents have taken advantage of the turf replacement rebate. The City has reimbursed water customers $100,425 to offset costs of replacing 237,549 square feet of lawn with climate-appropriate landscapes through the Landscape Water Conservation Rebate program. During the reporting period, the program is estimated to have reduced landscape water demand by 20.37 acre-feet annually.

Proposed New Rebate Programs

- *Stormwater Run-off Redirection Rebate:* The City is proposing a new rebate program that would help residents and businesses redirect stormwater run-off from impervious surfaces away from the municipal storm drain system or public water bodies (river, creek, seasonal drainage, wetland, etc.) into a rain barrel, cistern, rain garden, bio-swale, dry creek bed, or other passive bio-retention

feature in their landscape. The program is still in the development phase and will be piloted to see interest and effectiveness. The program would provide qualifying applicants with a $1.00 per square foot (of the impervious area) rebate, up to a maximum of $1,000 (single family) or up to $2,000 (commercial). It would only apply to properties 2,500 square feet and less and not to new developments. This rebate would require a pre-approval inspection and a post-installation inspection.

- *Submetering Rebate:* Multi-family and commercial properties who install sub-meters for individual residences or landscape irrigation would qualify for up to $150 per sub-meter installed at apartment complexes, condominiums, mobile homes, commercial complexes, and landscapes. A pre- and post-construction inspection would be required. This program is still in the development phase and will be piloted when the City has all the necessary tools and equipment in place to do so.

9.1.5 PROGRAMS TO ASSESS AND MANAGE DISTRIBUTION SYSTEM REAL LOSS

The City routinely conducts distribution system water audits, leak detection, and repair, as shown in Table 9-3. The City has permanently incorporated these programs into its utility operations. System losses are calculated by comparing the volume of water pumped from City wells and the surface water system to the volume of water delivered to customers. As noted in Chapter 4, the City's annual system audits have shown losses of approximately 8 percent, which were below the reported California average of ten percent for system water loss.

In addition to monitoring water losses, starting in 2014, the City has redoubled its efforts to replace aging water infrastructure. The Watsonville City Council has recognized and supported adjustment to water rates to allow for expediting of the main replacement program.

TABLE 9-3: WATER MAIN AND SERVICE CONNECTION REPAIRS

	2016	2017	2018	2019	2020
Service Connection Breaks/Leaks	68	72	133	54	39
Main Line Breaks/Leaks	5	6	9	12	19

The City recognizes that as infrastructure continues to age, service connections and water main breaks will continue to increase. The City actively looks for and, in a timely fashion, fixes leaks and breaks to minimize water loss.

9.1.6 WATER CONSERVATION PROGRAM COORDINATION AND STAFFING SUPPORT

The City employs an Environmental Projects Manager who serves as the water conservation coordinator. Tasks include oversight and implementation of extensive conservation programs, program reporting, and communication of water conservation issues within the City organization and to the public. This manager is assisted by the Environmental Outreach Team that consists of three full-time and two part-time employees. In addition to the water conservation program, this manager also oversees outreach in the areas of solid waste,

recycling, wastewater, stormwater, and climate change. This team provides educational and outreach of water conservation measures to all residents, businesses, and the youth. Under this organizational structure, this robust team is able to direct resources to priority issues. For example, during drought years, the Outreach Team will redouble its efforts on water conservation. The Environmental Projects Manager also receives additional support from various divisions within the Public Works and Utilities Department, including the Water Operations, Customer Service (metering), and Engineering Divisions. In addition, the City contracts consultation services from licensed landscape irrigation specialists who provide technical assistance to City facilities, local businesses, and residents and help implement the City's Landscape Consultation Program, the Lawn Replacement Rebate Program, the Green Gardener program, and the MWELO.

9.1.7 OTHER DEMAND MANAGEMENT MEASURES

Conservation Programs for Commercial, Industrial, and Institutional Accounts
The City's Water Pollution Prevention Source Control Program works with commercial and industrial users to reduce water use. Annual inspections of the larger industrial facilities (those with wastewater flows more than 25,000 GPD) focus on pollution prevention and water conservation. Water use by industrial and large commercial users is measured monthly.

Water Conservation on City Properties
The irrigation systems at the City's parks, open space, and municipal buildings have undergone complete water use audits. Repairs and improvements are being made to systems on an annual basis with a goal to reach current MWELO standards for irrigation equipment. Weather-based irrigation controllers have been installed at four City parks. A 20 percent reduction in park irrigation was implemented during the drought and is ongoing for the future. Over the last five years, the City has also retrofitted over 50,000 square feet of turf grass and antiquated sprinkler irrigation systems at multiple City properties, including replacing 34,400 square feet of irrigated turf grass in medians along a ¾-mile stretch of Bridge Street with mulch, low-water use perennials, and low-volume irrigation. The program is estimated to have reduced landscape water demand by 7.24 acre-feet annually.

9.2 IMPLEMENTATION OF DEMAND MANAGEMENT MEASURES, PAST FIVE YEARS

The narrative in Section 9.1 above provides both the nature and extent of the DMMs implemented over the last five years. As required by the 2020 UWMP Guidebook, a summary of the quantification (extent) of the DMMs is provided in Table 9-4.

TABLE 9-4: EXTENT OF DEMAND MANAGEMENT MEASURES — QUANTIFICATION

DEMAND MANAGEMENT MEASURE	QUANTIFICATION
Model Water Efficient Landscape Ordinance	In place since 2015
Metering – All service connections including fire have dedicated meters. Contractor fill points are metered with portable meters.	All service connections are metered, including fire
Metering	60% of the meters are smart meter technology, while the remaining 40% are AMR
Conservation Pricing for Single Family Residential (Appendix 9-3)	Tier 1: 1 to 5 hcf Tier 2: 6 to 10 hcf Tier 3: Greater than 10 hcf
Public Education and Outreach	Website: Ongoing Social Media Postings: Ongoing Brochure Racks at City Facilities Water Bill Notices: Monthly Booths at local events and festivals Funding Green Gardener Certification Program and Public Workshops Funding Watersmart Garden Web Tool Appliance Rebates Landscape Consultation Program Conservation Academy Youth Education Outreach Watsonville Nature Center Conservation Devices Outreach
Programs to Assess and Manage Distribution System Real Loss	Water losses = 8%
Water Conservation Program Coordination and Staffing Support	Environmental Projects Manager assisted by 3 full-time and 2 part-time staff of the Environmental Outreach Team

9.3 WATER USE OBJECTIVES

California Water Code §10609, adopted in 2018, establishes new standards and practices for:

- Indoor residential water use
- Outdoor residential water use

- CII water use – commercial water users, industrial water users, institutional water users, and large landscape water users
- Water losses
- Other unique local uses and situations

In §10609.4, the Legislature set the water use objectives for indoor residential water use as follows:

> 55 GPDC until 1/1/2025
>
> <=52.5 GPCD until 1/1/30
>
> <=50 GPCD thereafter or a standard recommended by the Department of Water Resources

The code further specifies that:

> (1) Local urban retail water suppliers should have primary responsibility for meeting standards-based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.
>
> (2) Long-term standards and urban water use objectives should advance the state's goals to mitigate and adapt to climate change.
>
> (3) Long-term standards and urban water use objectives should acknowledge the shade, air quality, and heat-island reduction benefits provided to communities by trees through the support of water-efficient irrigation practices that keep trees healthy.

Water use objectives and reporting will begin in 2023. It is expected that DWR will propose and implement methodologies for tracking and reporting indoor residential water use prior to 2023. As a preliminary estimate, the City of Watsonville looked at winter water use for 2020 and 2021. Single-family and multi-family residential water use ranged from 46 GPCD to 51 GPCD in the January–March timeframe for 2020 and 2021. While these numbers are encouraging and demonstrate the City's commitment to water conservation, it has yet to be determined how DWR will implement indoor water use objectives.

This page intentionally left blank.

10 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

[To be included after City Council adoption of the UWMP. The Council hearing on the plan is scheduled for June 22, 2021.]

This page intentionally left blank.