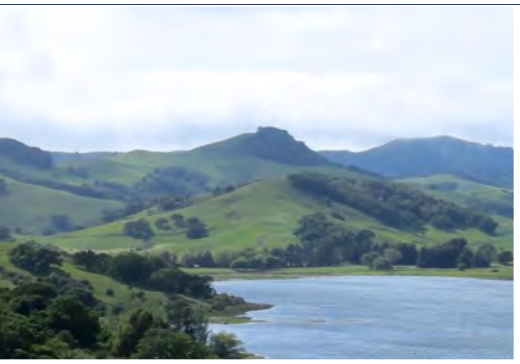
June 2021

2020 Urban Water Management Plan

for North Marin Water District






NORTH MARIN WATER DISTRICT

eki environment & water

NORTH MARIN WATER DISTRICT

TABLE OF CONTENTS

1. INTRODUCTION 1
1.1 Background and Purpose 1
1.2 Urban Water Management Planning and the California Water Code 1
1.3 Relationship to Other Planning Efforts 3
1.4 Plan Organization 3
1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions 3
1.6 Lay Description 4
2. PLAN PREPARATION 8
2.1 Compliance with the UWMP Act, Including Changes Since 2015 8
2.2 Coordination and Outreach 10
2.2.1 Wholesale Coordination 10
2.2.2 Agency Coordination 11
2.2.3 Public Participation 13
2.3 UWMP Structure, Standard Units, and Basis for Reporting 13
3. SERVICE AREA AND SYSTEM DESCRIPTION 15
3.1 Population and Employment Trends Within the Service Area 15
3.1.1 Future Population Growth 15
3.1.2 Future Employment Growth 16
3.2 Land Uses within Service Area 17
3.3 Service Area Social, Economic, and Demographic Factors 18
3.4 Climate 19
3.5 Climate Change Considerations 20
3.6 Water Distribution System 21
4. SYSTEM WATER DEMANDS 24
4.1 Current and Historic Total Water Demand 25
4.1.1 Current and Historical Potable Water Demand 25
4.1.2 Current and Historical Non-Potable Water Demand 29

4.1.3 Potable Water Make-Up to the Recycled Water System 29
4.1.4 Distribution System Water Loss 30
4.2 Projected Total Water Demand 31
4.2.1 Projected Potable Water Demand 31
4.2.2 Projected Non-Potable Water Demand 33
4.2.3 Water Use for Lower Income Households 34
4.2.4 Water Savings from Codes, Standards, Ordinances, or Transportation and Land Use Plans 35
4.2.5 Projected Total Water Demand 37
4.3 Water Use Sectors Not Included in the Demand Projections 37
4.4 Climate Change Impacts to Demand 37
4.5 Urban Water Use Objectives (Future Requirements) 38
5. BASELINE WATER USE AND SB X7-7 WATER CONSERVATION TARGETS 41
5.1 Service Area Population 42
5.2 Baseline Water Use 43
5.2.1 Individual Baseline Water Use 43
5.2.2 Regional Baseline Water Use 44
5.3 Water Use Targets 45
5.3.1 Individual Water Use Targets 46
5.3.2 Regional Water Use Targets 46
5.4 2020 Target Compliance 48
6. WATER SUPPLY CHARACTERIZATION 50
6.1 Purchased Water 50
6.1.1 Sonoma County Water Agency Surface Water Supply 50
6.1.2 Sonoma County Water Agency Surface Water Rights 51
6.1.3 Sonoma County Water Agency Groundwater Supply 51
6.2 Groundwater 52
6.2.1 Basin Description and Status 53
6.2.2 Non-SGMA Groundwater Management 54
6.2.3 SGMA Groundwater Management 54
6.2.4 Coordination with Groundwater Sustainability Agencies 55

6.2.5 Historical Pumping and Supply Sufficiency 55
6.3 Surface Water 55
6.4 Stormwater 55
6.5 Wastewater and Recycled Water 56
6.5.1 Recycled Water Coordination 56
6.5.2 Wastewater Collection, Treatment, and Disposal 56
6.5.3 Recycled Water System and Potential, Current, and Projected Uses of Recycled Water 61
6.5.4 Comparison of Previously Projected Use and Actual Use 64
6.5.5 Actions to Encourage and Optimize Future Recycled Water Use 65
6.6 Desalinated Water 66
6.7 Water Exchanges and Transfers 66
6.8 Future Water Projects 67
6.9 Summary of Existing and Planned Sources of Water 68
6.10 Special Conditions 70
6.10.1 Climate Change Effects 70
6.10.2 Regulatory Conditions and Project Development 70
6.10.3 Other Locally Applicable Criteria 71
6.11 Energy Intensity 71
7. WATER SUPPLY RELIABILITY 73
7.1 Constraints on Water Sources 73
7.1.1 Supply Availability 73
7.1.2 Water Quality Impacts on Reliability 75
7.1.3 Climate Change Impacts to Supply 76
7.2 Reliability by Type of Year 77
7.2.1 Purchased Water 78
7.2.2 Surface Water 79
7.2.3 Raw Water 80
7.2.4 Recycled Water 80
7.3 Supply and Demand Assessment 81
7.4 Water Management Tools and Options 82

7.5 Drought Risk Assessment 83
7.5.1 Characteristic Five-Year Water Use 83
7.5.2 Risk Assessment Projections 83
8. WATER SHORTAGE CONTINGENCY PLAN 86
9. DEMAND MANAGEMENT MEASURES 95
9.1 Regional Water Conservation 95
9.1.1 Funding 96
9.1.2 Annual Report 96
9.1.3 Water and Energy Education Program 96
9.1.4 Public Outreach Program 97
9.1.5 Regional Programs 97
9.2 Agency Water Conservation 99
9.2.1 DMM 1 – Water Waste Prevention Ordinances 100
9.2.2 DMM 2 – Metering 101
9.2.3 DMM 3 – Conservation Pricing 101
9.2.4 DMM 4 – Public Education and Outreach 101
9.2.5 DMM 5 – Programs to Assess and Manage Distribution System Real Loss 102
9.2.6 DMM 6 – Water Conservation Program Coordination and Staffing Support 102
9.2.7 DMM 7 – Other DMMs 102
9.3 Planned Implementation to Achieve Water Use Targets 103
10. PLAN ADOPTION AND SUBMITTAL 104
10.1 Notification of UWMP Preparation 104
10.2 Notification of Public Hearing 105
10.2.1 Notice to Cities and Counties 105
10.2.2 Notice to the Public 105
10.3 Public Hearing and Adoption 106
10.4 Plan Submittal 107
10.5 Public Availability 107
10.6 Amending an Adopted UWMP or Water Shortage Contingency Plan 108

11. REFERENCES 109

TABLES

Table 2-1 Public Water Systems (DWR Table 2-1)
Table 2-2 Plan Identification (DWR Table 2-2)
Table 2-3 Water Supplier Information Exchange (DWR Table 2-4)
Table 2-4 Notification to Cities, Counties, and Other Agencies (DWR Table 10-1)
Table 2-5 Supplier Identification (DWR Table 2-3)
Table 3-1 Population - Current and Projected (DWR Table 3-1)
Table 3-2 Employment - Current and Projected
Table 3-3 Demographic and Housing Characteristics
Table 3-4 Average Monthly Climate Characteristics
Table 4-1 Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1)
Table 4-2 Historical and Current Potable Water Demand and Population
Table 4-3 Last Five Years of Water Loss Audit Reporting (DWR Table 4-4)
Table 4-4 Use for Potable and Non-Potable Water - Projected (DWR Table 4-2)
Table 4-5 Inclusion in Water Use Projections (DWR Table 4-5)
Table 4-6 Projected Water Use for Lower Income Households
Table 4-7 Projected Total Water Demand and Projected Passive and Active Water Conservation
Table 4-8 Total Water Use (Potable and Non-Potable) (DWR Table 4-3)
Table 4-9 Current and Projected Residential Per Capita Water Use
Table 5-1 SB X7-7 Service Area Population
Table 5-2 RA1 – Weighted Baseline
Table 5-3 Baselines and Targets Summary (DWR Table 5-1)
Table 5-4 DWR Regional Alliance Weighted 2020 Target
Table 5-5 SB X7-7 2020 Compliance – NMWD (DWR Table 5-2)
Table 5-6 DWR Regional Alliance Compliance Submittal
Table 6-1 Groundwater Volume Pumped (DWR Table 6-1)
Table 6-2 Wastewater Collected Within Area in 2020 (DWR Table 6-2)
Table 6-3 Wastewater Treatment and Discharge Within Service Area in 2020 (DWR Table 6-3)
Table 6-4 Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)
Table 6-5 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5)

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

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

Table 6-8 Water Supplies - Actual (DWR Table 6-8)

Table 6-9 Water Supplies - Projected (DWR Table 6-9)

Table 6-10 Recommended Energy Intensity - Total Utility Approach (DWR Table O-1B)

Table 7-1 Basis of Water Year Data (Reliability Assessment) (DWR Table 7-1)

Table 7-2 Projected Availability of SCWA Supply (Responds to DWR Table 7-1)

Table 7-3 Projected Availability of Local Surface Water Supply (Responds to DWR Table 7-1)

Table 7-4 Projected Availability of Raw Water Supply (Responds to DWR Table 7-1)

Table 7-5 Projected Availability of Recycled Water Supply (Responds to DWR Table 7-1)

Table 7-6 Normal Year Supply and Demand Comparison (DWR Table 7-2)

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

Table 7-8 Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)

Table 7-9 Characteristic Five-Year Water Use

Table 7-10 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)

Table 8-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)

FIGURES

Figure 3-1 Regional Vicinity Map

Figure 3-2 District Service Area Map

APPENDICES

Appendix A. Completed UWMP Checklist
Appendix B. *2020 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update,* North Marin Water District
Appendix C. UWMP Agency Notification Letters
Appendix D. UWMP Public Hearing Notices
Appendix E. Distribution System Map (Figure 3-3) from 2018 Novato Water System Master Plan Update
Appendix F. SB X7-7 Compliance Tables
Appendix G. Water Shortage Contingency Plan

Appendix H. North Marin Water District Regulation 15 – Water Conservation – Novato Service Area
Appendix I. Resolution 21-09 on 2020 Urban Water Management Plan and Water Shortage Contingency Plan 2020 Update

NORTH MARIN WATER DISTRICT

ABBREVIATIONS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
AF	acre-feet
AFY	acre-feet per year
AWE	Alliance for Water Efficiency
AWWA	American Water Works Association
BMP	Best Management Practice
CASGEM	California Statewide Groundwater Elevation Monitoring
CCR	California Code of Regulations
Census	United States Census
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CII	commercial, industrial, and institutional
CIMIS	California Irrigation Management Information System
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DDW	Division of Drinking Water
Delta	Sacramento-San Joaquin Delta
DIY	Do-It-Yourself
DMM	demand management measures
DOF	California Department of Finance
DRA	Drought Risk Assessment
DU	Dwelling Unit
DWR	Department of Water Resources
EIR	Environmental Impact Report
EKI	EKI Environment & Water, Inc.
EPA	United States Environmental Protection Agency
ETo	reference evapotranspiration
ft	feet
FY	fiscal year
GMP	Groundwater Management Plan
GPCD	gallons per capita per day
GPD	gallons per day
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
kWh	kilowatt-hour
LAFCo	Local Agency Formation Commission
LGVSD	Las Gallinas Valley Sanitary District
LHMP	Local Hazard Mitigation Plan
Methodologies	*Methodologies for Calculating Baseline and Compliance Urban Per Capita Water, California Department of Water Resources Division of Statewide Integrated Water Management Water Use and Efficiency Branch*

MFR	multi-family residential
MGD	million gallons per day
MMWD	Marin Municipal Water District
MOU	Memorandum of Understanding
NBWRA	North Bay Water Reuse Authority
NMFS	National Marine Fisheries Service
NMWD	North Marin Water District
NMWRA	North Bay Water Reuse Authority
NSD	Novato Sanitary District
PG&E	Pacific Gas & Energy
Plan	Urban Water Management Plan
RHNA	Regional Housing Needs Allocation
RUWMP	Regional Urban Water Management Plan
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCWA	Sonoma County Water Agency
SFR	single family residential
SGMA	Sustainable Groundwater Management Act
SMSWP	Sonoma-Marin Saving Water Partnership
Sonoma Water	Sonoma County Water Agency
STP	Stafford Treatment Plant
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
Target	water use target
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
UWMP Guidebook 2020	*Urban Water Management Plan Guidebook 2020*
VOMWD	Valley of the Moon Water District
WAC	Water Advisory Committee
WRP	Water Recycling Plant
WSCP	Water Shortage Contingency Plan
WUE	water use efficiency
WWTP	Wastewater Treatment Plant

1. INTRODUCTION

This chapter discusses the importance and uses of this Urban Water Management Plan (UWMP or Plan), the relationship of this Plan to the California Water Code (CWC), the relationship of this Plan to other local and regional planning efforts, and how this Plan is organized and developed in general accordance with the Urban Water Management Plan Guidebook 2020 (UWMP Guidebook 2020).[1]

1.1 Background and Purpose

This UWMP addresses the North Marin Water District (NMWD or District) Novato Water System. As discussed in Section 2.1, the District also operates the West Marin Water System, which is a separate public water system with a separate source of supply and no physical interconnection of facilities between the Novato and West Marin Water System. The West Marin Water System has only 770 connections, serving approximately 1,800 people and approximately 228 AFY, and is therefore not subject to the UWMP Act. Thus, this Plan includes information on the Novato Water System only, and where the terms "District" and NMWD are used, they are referring to the Novato Water System portion of the District unless otherwise noted.

The District receives the majority (approximately two-thirds) of its water from Sonoma County Water Agency (SCWA or Sonoma Water), which provides surface water from the Russian River and to a lesser extent groundwater from the Santa Rosa Plain Subbasin of the Santa Rosa Valley Basin (California Department of Water Resources [DWR] Basin No. 1-55.01). The remainder of the District's water supply is from its local Stafford Lake water supply and recycled water developed in cooperation with Novato and Las Gallinas Valley Sanitary Districts.

This UWMP is a foundational document and source of information about the District's historical and projected water demands, water supplies, supply reliability and potential vulnerabilities, water shortage contingency planning, and demand management programs.

The District's previous UWMP was completed in 2016, referred to herein as the "2015 UMWP." This Plan is an update to the 2015 UWMP and carries forward information from that plan that remains current and is relevant to this Plan and provides additional information as required by amendments to the Urban Water Management Planning Act (UWMP Act) (CWC §10610 – 10657). Although this Plan is an update to the 2015 UWMP, it was developed to be a self-contained, stand-alone document.

1.2 Urban Water Management Planning and the California Water Code

The UWMP Act requires urban water suppliers to prepare an UWMP every five years and to submit this plan to DWR, the California State Library, and any city or county within which the supplier provides water. All urban water suppliers, either publicly or privately owned, providing water for municipal purposes

[1] The UWMP Guidebook 2020 is available at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans.

either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP (CWC §10617).

The UWMP Act was enacted in 1983. Over the years it has been amended in response to water resource challenges and planning imperatives confronting California. A significant amendment was made in 2009 as a result of the governor's call for a statewide 20% reduction in urban water use by 2020, referred to as "20x2020," the Water Conservation Act of 2009, and "Senate Bill (SB) X7-7." This amendment required urban retail water suppliers to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20% by 2020. Beginning in 2016, urban retail water suppliers were required to comply with the water conservation requirements in SB X7-7 in order to be eligible for state water grants or loans. Chapter 5 of this Plan contains the data and calculations used to determine compliance with these requirements.

A subsequent substantial revision to the UWMP Act was made in 2018 through a pair of bills (i.e., Assembly Bill [AB] 1668 and Senate Bill 606), referred to as "Making Water Conservation a California Way of Life" or the "2018 Water Conservation Legislation." These changes include significant revisions and additions to the required content for an UWMP and its associated Water Shortage Contingency Plan (WSCP). As applicable, the City's 2020 UWMP reflects the following significant revisions to the UWMP Act that have been made since 2015.

- ***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."
- ***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.
- ***Energy Intensity Analysis***. UWMPs are now required to include water system energy usage information that can be readily obtained.
- ***Seismic Risk***. The Water Code now requires suppliers to specifically address seismic risk to various water system facilities and to have a mitigation plan, and for this to be described in their WSCPs.
- ***Water Shortage Contingency Plan***. In 2018, the UWMP Act was modified to require a WSCP with specific elements, including developing procedures to perform an annual water supply and demand assessment.
- ***Groundwater Supplies Coordination***. The Water Code now requires that the 2020 UWMPs for suppliers that utilize groundwater as a supply source are consistent with Groundwater Sustainability Plans, in areas where those plans have been completed by the 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.

The UWMP Act contains numerous other requirements that an UWMP must satisfy. **Appendix A** to this Plan lists each of these requirements and where in the Plan they are addressed.

1.3 Relationship to Other Planning Efforts

This Plan provides information specific to water management and planning by the District. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these relevant planning documents include relevant city and county General Plans, Water Master Plans, integrated resource plans, and others.

This Plan is informed by and helps to inform these other planning efforts. In particular, this Plan utilizes information contained in local and regional water resource plans to the extent data from these plans are applicable and available.

1.4 Plan Organization

The organization of this Plan follows the same sequence as outlined in the UWMP Guidebook 2020.

Chapter 1 - Introduction

Chapter 2 - Plan Preparation

Chapter 3 - Service Area and System Description

Chapter 4 - System Water Demands

Chapter 5 - Baseline Water Use and SB X7-7 Water Conservation Targets

Chapter 6 - Water Supply Characterization

Chapter 7 - Water Supply Reliability

Chapter 8 - Water Shortage Contingency Plan

Chapter 9 - Demand Management Measures

Chapter 10 - Plan Adoption and Submittal

Chapter 11 - References

In addition to these eleven chapters, this Plan includes a number of appendices providing supporting documentation and supplemental information. Pursuant to CWC §10644(a)(2), this Plan utilizes the standardized forms, tables, and displays developed by DWR for the reporting of water use and supply information required by the UWMP Act. This Plan also includes additional tables, figures, and maps to augment the set developed by DWR, as appropriate. The table headers indicate if the table is part of DWR's standardized set of submittal tables.

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

Although not required by the UWMP Act, in the UWMP Guidebook 2020, DWR recommends that all suppliers that are participating in, or may participate in, receiving water from a proposed project that is

considered a "covered action" under the Delta Plan—such as a (1) multiyear water transfer; (2) conveyance facility; or (3) new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta)—provide information in their UWMP to demonstrate consistency with the Delta Plan policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code of Regulations, Title 23, Section 5003).

The District obtains its water supplies from the SCWA Russian River Project, local surface water from Stafford Lake, and recycled water, and therefore the District does not receive water or plan to receive water from a "covered action" under the Delta Plan. As such, demonstration of consistency with the Delta Plan is not applicable.

1.6 Lay Description

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This Urban Water Management Plan (UWMP or Plan) is prepared for North Marin Water District (also referred to as NMWD or District), which serves drinking water to a population of approximately 61,658 in and around the City of Novato, California. In addition to the Novato Water System, the District also operates the West Marin Water System, which is a separate public water system with a separate source of supply and no physical interconnection of facilities between the Novato and West Marin Water System. Only information regarding the Novato Water System is included herein, and where the terms "District" and "NMWD" are used, they are referring to the Novato Water System portion of the District unless otherwise noted. This UWMP serves as a foundational planning document and includes descriptions of historical and projected water demands and water supplies and reliability over a 20-year planning horizon. This document also describes the actions the District is taking to promote water conservation, both by the District and by its customers (referred to as "demand management measures") and includes a plan to address potential water supply shortages such as drought or other impacts to supply availability (the "Water Shortage Contingency Plan"). This UWMP is updated every five years in accordance with state requirements under the Urban Water Management Planning Act (UWMP Act) and amendments (Division 6 Part 2.6 of the California Water Code [CWC] §10610 – 10656). Past plans developed for the District are available on the California Department of Water Resources (DWR) Water Use Efficiency Data Portal website: https://wuedata.water.ca.gov/. This Plan includes 11 chapters, which are summarized below.

Chapter 1 - Introduction

This chapter presents the background and purpose of the UWMP, identifies the Plan organization, and provides this lay description overview of the document.

Chapter 2 - Plan Preparation

This chapter discusses key structural aspects related to the preparation of the UWMP and describes the coordination and outreach conducted as part of the preparation of the Plan, including coordination with

local agencies (i.e., members of the Sonoma-Marin Saving Water Partnership [SMSWP], Sonoma and Marin Counties) and the public.

Chapter 3 - Service Area and System Description

This chapter provides a description of the District's water system and service area, including information related to the climate, population, and demographics. The District serves a population of approximately 61,658 and has a moderate climate characterized by hot dry summers and cool wet winters. The majority of precipitation falls during late autumn, winter, and spring, averaging 26 inches of rainfall annually. Land use within the District is primarily residential, but also includes agricultural, industrial, commercial, and recreational land uses.

Chapter 4 - System Water Demands

This chapter provides a description and quantifies the District's current and projected demands through the year 2045. The District provides drinking water (also referred to as "potable water"), raw water, and recycled water to customers. Raw and recycled water are used within the District primarily for irrigation purposes. Water demands refer not only to the water used by customers, but also includes the water used as part of the system maintenance and operation, as well as unavoidable losses inherent in the operation of a water distribution system. Potable and raw water demand within the District was 7,942 acre-feet per year (AFY) on average between 2016 and 2020. Taking into account historical water use, expected population increase and other growth, climatic variability, and other assumptions, potable and raw water demand within the District is projected to increase to 10,502 AFY by 2045, an increase of 23% compared to the 2016-2020 average.

Recycled water demand was 540 acre-feet per year (AFY) on average between 2016 and 2020 and is projected to increase to 650 AFY by 2045, an increase of 20% compared to the 2016-2020 average. The District's recycled water system and demands are discussed in Chapter 6.

Chapter 5 - Baseline Water Use and SB X7-7 Water Conservation Targets

In this chapter, the District demonstrates compliance with its per capita water use target for the year 2020. The Water Conservation Act of 2009 (Senate Bill [SB] X7-7) was enacted in November 2009 and requires the state of California to achieve a 20% reduction in urban per capita water use by 31 December 2020. In order to achieve this, each urban retail water supplier was required to establish water use targets for 2015 and 2020 using methodologies established by DWR. The District is in compliance with its 2020 water use target of 139 gallons per capita per day (GPCD), having reduced its water use in 2020 to 119 GPCD. The District is also a member of a "Regional Alliance" for purposes of SB X7-7 compliance. The Regional Alliance's 2020 water use was 113 GPCD, which is in compliance with and below its 2020 target of 129 GPCD.

Chapter 6 - Water Supply Characterization

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

Water supply for the District comes primarily from purchased water from Sonoma County Water Agency (SCWA or Sonoma Water) Russian River Project. The Russian River, Lake Mendocino, and Lake Sonoma are primary sources for the Russian River Project. The SCWA supply also includes a relatively small amount of groundwater from groundwater supply wells located in the Santa Rosa Plain Subbasin of the Santa Rosa Valley Basin [DWR Basin 1-55.01] (SCWA, 2016). This water supply is supplemented by local surface water from Stafford Lake and recycled water from Novato Sanitary District (NSD) and Las Gallinas Valley Sanitary District (LGVSD). Based on comparison of demands and available supplies, the District's water supply is expected to be sufficient to support the District's projected water demand through 2045 during normal hydrologic years.

Calculation and reporting of water system energy intensity is a new requirement for the 2020 UWMPs. Energy intensity is defined as the net energy used for water treatment, conveyance, and distribution for all water entering the District's distribution system and does not include the energy used to convey or treat wastewater. The energy intensity for NMWD is estimated to be 341 kilowatt hours per acre-foot of water (kWh/AF). In order to reduce the overall net energy consumption by the system, solar energy is also produced at the Stafford Treatment Plant (STP). If the solar energy generated were discounted from total energy consumption, the net energy intensity for NMWD would be 258 kWh/AF.

Chapter 7 - Water Supply Reliability

This chapter assesses the reliability of NMWD's water supplies, with a specific focus on potential constraints such as water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of the District's supply (such as drought conditions) to support the District's planning efforts. Water service reliability is assessed during normal, single dry-year, and multiple dry-year hydrologic conditions. Based on this analysis, the District expects the available supplies to be sufficient to meet projected demands in all hydrologic conditions, including a five-year drought period, and considering the impacts of climate change.

Further, potential water quality issues are not expected to affect the quality of water served to the District's customers, as water quality is routinely monitored, and the District is able to make all appropriate adjustments to its treatment and distribution system to ensure only high-quality drinking water is served.

Chapter 8 - Water Shortage Contingency Plan

This chapter describes the Water Shortage Contingency Plan (WSCP) for NMWD. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. For example, implementing customer water budgets and surcharges, or restricting landscape irrigation to specific days and/or times. Consistent with DWR requirements, the WSCP includes six levels to address shortage conditions ranging from up to 10% to greater than 50% shortage.

Chapter 9 - Demand Management Measures

This chapter includes descriptions of past and planned conservation programs that NMWD and the Sonoma-Marin Saving Water Partnership (SMSWP) operate within each demand management measure (DMM) category outlined in the UWMP Act, specifically: (1) water waste prevention ordinances, (2) metering, (3) conservation pricing, (4) public education and outreach, (5) distribution system water loss

management, (6) water conservation program coordination and staffing support, and (7) "other" DMMs. NMWD has developed a suite of conservation programs and policies which address each DMM category. Through the implementation of DMMs, both independently and through the Sonoma-Marin Saving Water Partnership (SMSWP), it is estimated that between the years 2016 and 2020, NMWD saved 644 AF, or 129 AFY on average, through implementation of active conservation programs.

Chapter 10 - Plan Adoption and Submittal

This chapter provides information on a public hearing, the adoption process for the UWMP and WSCP, the adopted UWMP and WSCP submittal process, UWMP and WSCP implementation, and the process for amending the adopted UWMP and WSCP. Prior to adopting the Plan, NMWD held a formal public hearing to present information on its UWMP and WSCP on 15 June 2021 at 6:00 pm. The UWMP and WSCP were submitted to DWR within 30 days of adoption and by the 1 July 2021 deadline.

Chapter 11 - References

This chapter contains key references and sources used throughout the Plan.

2. PLAN PREPARATION

This section provides information on the process for developing North Marin Water District's (NMWD's or District's) 2020 Urban Water Management Plan (UWMP or Plan), including an overview of coordination with other agencies and a description of public outreach.

Text from the UWMP Act has been included in grey text boxes with italicized font at beginning of relevant sections of this UWMP. The information presented in the respective UWMP sections and the associated text, figures, and tables are collectively intended to fulfill the requirements of that sub-section of the UWMP Act. To the extent practicable, supporting documentation has also been provided in **Appendix A** through **Appendix J**. Other sources for the information contained herein are provided in the references section of this document.

Per CWC §10644(a)(2), selected information for the 2020 UWMP updates must be presented in standardized tables for electronic submittal to DWR. The tables presented in this UWMP have been re-numbered, but the content has been preserved and the original DWR table numbers are included in parentheses in the table titles.

2.1 Compliance with the UWMP Act, Including Changes Since 2015

☑ ***CWC § 10620 (b)***

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

The District's 2020 UWMP has been prepared in accordance with the Urban Water Management Planning Act (UWMP Act). The UWMP Act is defined by the California Water Code (CWC) §10610 - §10657. The UWMP Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections or supplies more than 3,000 acre-feet (AF) of water annually adopt and submit a plan every five years to the California Department of Water Resources (DWR).

Table 2-1 (DWR Table 2-1) provides information on the District's public water system that served 20,463 connections and 8,194 acre-feet per year (AFY) within the Novato service area and is therefore subject to the requirements of the UWMP Act. The District also operates the West Marin Water System, which is a separate public water system with a separate source of supply and no physical interconnection of facilities between the Novato and West Marin Water System. The West Marin Water System has only 770 connections, serving approximately 1,800 people and approximately 228 AFY, and is therefore not subject to the UWMP Act. Thus, this Plan includes information on the Novato Water System only.

Table 2-1 Public Water Systems (DWR Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
02-18-09P2110003	Novato Water System	20,463	8,194
	TOTAL	20,463	8,194

NOTES: (a) The District also operates the West Marin Water System, which is a separate public water system with a separate source of supply and no physical interconnection of facilities between the Novato and West Marin Water System. The West Marin Water System has only 770 connections, serving approximately 1,800 people and approximately 228 AFY, and is therefore not subject to the UWMP Act.

As with the 2010 and 2015 UWMPs, the District's 2020 UWMP has been prepared as an individual rather than a regional plan, as shown in **Table 2-2** (DWR Table 2-2). However, the 2020 UWMP was developed in close coordination with its wholesaler, Sonoma County Water Agency (SCWA or Sonoma Water), and other agencies that receive water from the SCWA (referred to herein as Water Contractors). Furthermore, a regional Alliance was formed in 2011 among these agencies including the cities of Santa Rosa, Rohnert Park, Sonoma, Cotati, Petaluma, Town of Windsor, Marin Municipal Water District, Valley of the Moon Water District, and North Marin Water District to comply with Senate Bill (SB) X7-7, the Water Conservation Act of 2009. This regional Alliance, referred to in **Table 2-2** as the "North Marin Sonoma Alliance" but more typically referred to as the Sonoma-Marin Saving Water Partnership (SMSWP), is used within the 2020 UWMP for reporting on regional 2020 water use targets (see Chapter 5). All other elements of the CWC requirements are addressed in the District's Individual Plan.

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

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable*
X	Individual UWMP		
		Water Supplier is also a member of a RUWMP	
	X	Water Supplier is also a member of a Regional Alliance	North Marin-Sonoma Alliance
	Regional Urban Water Management Plan (RUWMP)		
NOTES:			

2.2 Coordination and Outreach

Coordination with other water suppliers, cities, counties, and other community organizations in the region is an important part of preparing a UWMP and Water Shortage Contingency Plan (WSCP). This section identifies the agencies and organizations the District sought to coordinate with during preparation of this Plan.

2.2.1 Wholesale Coordination

☑ ***CWC § 10631 (h)***

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

Urban retail water suppliers relying on one or more wholesalers for water supply are required to provide these wholesalers with information regarding projected water supply and demand. The District meets regularly with other water purveyors to discuss water supply and demand planning. In particular, the District meets at least monthly with its water wholesaler, the SCWA, and with other Water Contractors who purchase water from the SCWA. These monthly meetings occur through the District's participation in the SCWA Technical Advisory Committee (TAC). The primary mission of the TAC is to provide input and guidance to the SCWA regarding technical issues that may have an impact on the Water Contractors (i.e., UMWP coordination, capital projects, operational changes, etc.). Additionally, the District participates in quarterly meetings of the Water Advisory Committee (WAC). The WAC's objectives are to advise the SCWA's Board of Directors on policy and fiscal matters affecting the Water Contractors. The District's participation in the TAC and WAC has been instrumental in coordinating water supply and demand analyses for the preparation of this Plan.

The District's water supply primarily comes from water purchased from the SCWA. The District, along with eight other Water Contractors, has a water supply agreement with the SCWA for the purchase of Russian River water commonly referred to as the Restructured Water Supply Agreement. As indicated in **Table 2-3**, the District coordinated the development of its demand projections with members of the Sonoma-Marin Saving Water Partnership (SMSWP). Demand projections through 2045 were provided through the Partnership to SCWA.

Table 2-3 Water Supplier Information Exchange (DWR Table 2-4)

The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
Sonoma County Water Agency
NOTES:

As discussed in Chapter 4, the District's projected water demands were developed as part of a planning effort in 2020 that was implemented through the Sonoma-Marin Saving Water Partnership (SMSWP) (i.e., the *2020 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update* included as **Appendix B**). The SCWA was provided with the District's water use projections through this process. The District will continue to coordinate with the SCWA to determine the timing of capital improvement projects that may need to be implemented in order to meet the District's projected future water demands.

Additionally, as described in more detail in Chapter 7, the District has relied upon the water supply reliability projections provided by SCWA for the purposes of analyzing the reliability of its Russian River water supplies during normal and dry years through 2045.

2.2.2 Agency Coordination

☑ ***CWC § 10620 (d) (3)***

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

As part of the development of this Plan, the District coordinated closely with the other eight SCWA Water Contractors. Among other methods, this coordination occurred through regular meetings of the TAC and WAC (see Section 2.2.1). These agencies also coordinate as part of the SMSWP. The District also coordinated preparation of the Plan with the Novato Sanitary District, the Las Gallinas Valley Sanitary District, the Marin County Local Agency Formation Commission (LAFCo), the County of Marin, and the County of Sonoma. On 19 November 2020, a letter was sent to each of these entities advising that the District was reviewing and updating the UWMP. The agencies, cities, and counties that were notified by the District during the development of this Plan are listed in **Table 2-4**. A sample copy of the notices is provided in **Appendix C**.

Table 2-4 Notification to Cities, Counties, and Other Agencies (DWR Table 10-1)

City Name	60 Day Notice	Notice of Public Hearing
City of Cotati	X	X
City of Novato	X	X
City of Petaluma	X	X
City of Rohnert Park	X	X
City of Santa Rosa	X	X
City of Sonoma	X	X
Town of Windsor	X	X
County Name	**60 Day Notice**	**Notice of Public Hearing**
Marin County	X	X
Sonoma County	X	X
Other Agency Name	**60 Day Notice**	**Notice of Public Hearing**
Las Gallinas Valley Sanitary District	X	X
Marin County Local Agency Formation Commission	X	X
Marin Municipal Water District	X	X
Novato Sanitary District	X	X
Sonoma County Water Agency	X	X
Valley of the Moon Water District	X	X
NOTES:		

2.2.3 Public Participation

☑ *CWC § 10642*

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

Water suppliers are required by the UWMP Act to encourage active involvement of the community within the service area prior to and during the preparation of its UWMP and WSCP. The UWMP Act also requires water suppliers to make a draft of the UWMP and WSCP available for public review and to hold a public hearing regarding the findings of the UWMP and WSCP prior to their adoption. In addition to sending notices of the District's intent to prepare its UWMP and WSCP to the various agencies listed in 2.2.2, the District also included a public notice in the local newspaper (i.e., the Marin Independent Journal) notifying the public that draft UWMP and WSCP were available for review and that the District was seeking public input and comments, including during the public hearing. Public participation in the development of the District's 2020 UWMP and WSCP are summarized in **Appendix D**.

The Public Review Draft 2020 UWMP and WSCP were made available for public review at the District's office and on the District's website (https://www.nmwd.com).

2.3 UWMP Structure, Standard Units, and Basis for Reporting

As summarized in **Table 2-5**, the District is a water retailer and unless otherwise indicated, the data included in the following sections is presented in units of AF or AFY; annual values represent fiscal years (FY) spanning from 1 July to 30 June of the following year. As such, "2020" represents FY 2019-20, and so forth.

Further, consistent with the Guidebook, the terms "water use", "water consumption", and "water demand" are used interchangeably in this UWMP.

Table 2-5 Supplier Identification (DWR Table 2-3)

Type of Supplier	
	Supplier is a wholesaler
X	Supplier is a retailer
Fiscal or Calendar Year	
	UWMP Tables are in calendar years
X	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
07/01	
Units of measure used in UWMP	
Unit	AF
NOTES:	

3. SERVICE AREA AND SYSTEM DESCRIPTION

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

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

The North Marin Water District (NMWD or District) service area is shown on **Figure 3-1** and **Figure 3-2**. The majority of the District is located in the Marin County and provides service to customers in the City of Novato and surrounding unincorporated areas (NMWD, 2019).[2]

3.1 Population and Employment Trends Within the Service Area

Employment in the District's service area includes a variety of industries, with the majority working in education, health services, professional/scientific occupations, management, finance, and retail (City of Novato, 2014). Regionally, employment in the agricultural industry is related to vineyards, livestock, orchards, silage crops, and timber. The primary industrial activities in the region include biochemical production and other high technology, limited wine production, other agricultural product processing, and miscellaneous manufacturing. Recreation and tourism are small but growing industries in the region (SCWA, 2016).

3.1.1 Future Population Growth

Table 3-1 and its associated chart list the current and projected population for the District's service area, including population served outside the City of Novato boundary[3], through the year 2045. The 2020 population was calculated using a per dwelling unit multiplier method for use in the Senate Bill (SB) X7-7 analysis. Further detail regarding 2020 population calculations can be found in Chapter 5. Population projections were developed separately based on population projections by the Association of Bay Area Governments (ABAG) Plan Bay Area Projections 2040 (ABAG, 2018), including the Regional Housing Needs

[2] As noted in Section 2.1, the District also operates a separate public water system (the West Marin Water System), which has a separate supply source, is not interconnected to the Novato System, and is not subject to UWMP Act requirements.

[3] Population estimates do not include estimates for the West Marin Water System.

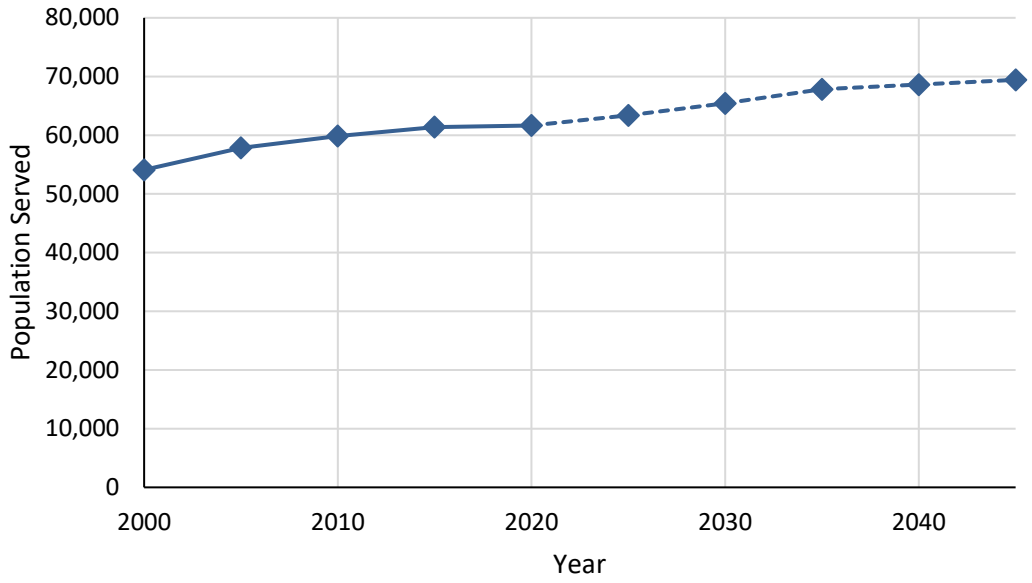
Allocation (RHNA) per ABAG (2020), as described further in the *2020 Water Demand Analysis and Water Conservation Measure Update* (Water Demand Report; EKI, 2020; **Appendix B**).

Table 3-1 Population - Current and Projected (DWR Table 3-1)

Population Served	2020	2025	2030	2035	2040	2045
	61,658	63,389	65,440	67,838	68,631	69,432

NOTES:
(a) Current population data is further documented in **Table 4-9**.
(b) Projected population growth was calculated by applying City of Novato ABAG (2018) growth rates to the 2020 population estimate, which includes an estimated population for area served outside the City of Novato boundary and adjusting for the new housing units per the Required Housing Needs Allocation (RHNA).

Chart 3-1 Current and Projected Population



3.1.2 Future Employment Growth

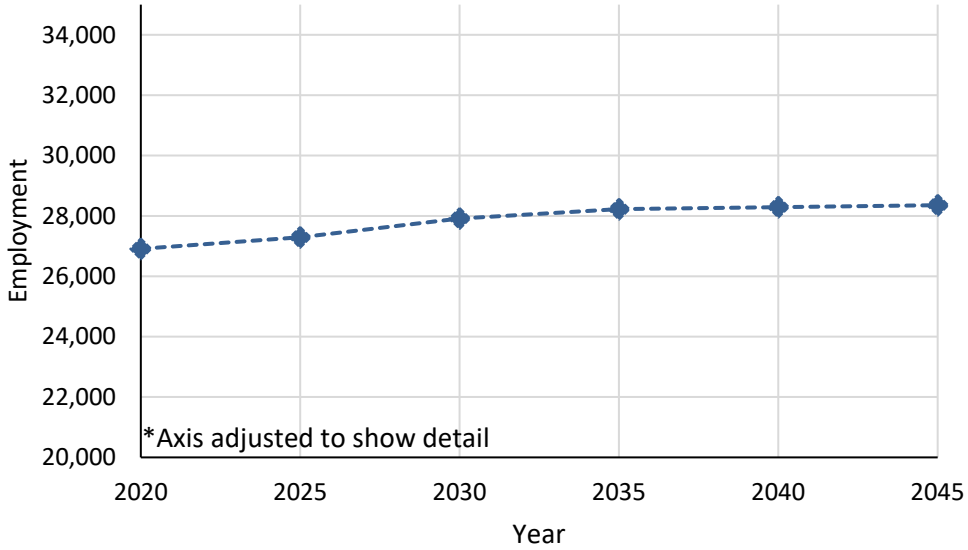
Table 3-2 and its associated chart the current and projected employment for the City of Novato through the year 2045. Current and projected employment was developed as described in the Water Demand Report (EKI, 2020; **Appendix B)**.

Table 3-2 Employment - Current and Projected

Service Area Employment	2020	2025	2030	2035	2040	2045
	26,910	27,290	27,915	28,225	28,290	28,355

NOTES:
(a) Current and projected employment growth per ABAG (2018). Projections reflect the City of Novato and not the entirety of the District service area.

Chart 3-2 Current and Projected Employment



3.2 Land Uses within Service Area

Land use within the District is primarily residential, but also includes agricultural, industrial, commercial, and recreational land uses. Current land use maps within the District can be found in the Land Use Element of the City of Novato General Plan 2035 (City of Novato, 2020)[4] and the Marin Countywide Plan (Marin County, 2014)[5]. Future land uses are expected to be remain generally consistent with current land uses. Per the Regional Housing Needs Allocation (ABAG, 2020), substantial new residential units are expected

[4] The City of Novato General Plan 2035 is available at the City's website: https://www.novato.org/home/showpublisheddocument?id=30461.

[5] The Marin Countywide Plan is available at the county's website: https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_2015_update_r.pdf?la=en.

to be constructed within the City of Novato, which has been accounted for in the population projections discussed above.

3.3 Service Area Social, Economic, and Demographic Factors

Demographics for the City of Novato, which accounts for a majority of the service area population, are summarized in **Table 3-3**. The same data are also provided for the state of California as a whole. Data were obtained from the U.S. Census Bureau QuickFacts website (U.S. Census, 2021). Relative to the rest of California, the City of Novato's population is slightly older and somewhat less racially diverse. Educational attainment and median household income in City of Novato are higher than for the state as a whole, while population below the poverty level is comparatively lower.

Table 3-3 Demographic and Housing Characteristics

Demographics (a)	City of Novato	California
Age and Sex		
Persons under 5 years	4.4%	6.0%
Persons under 18 years	18.7%	22.5%
Persons 65 years and older	20.6%	14.8%
Female persons	51.4%	50.3%
Race and Hispanic Origin		
White alone	72%	71.9%
Black or African American alone	3.7%	6.5%
American Indian and Alaska Native alone	0.2%	1.6%
Asian alone	7.7%	15.5%
Native Hawaiian and Other Pacific Islander alone	0.10%	0.5%
Two or More Races	5.3%	4.0%
Hispanic or Latino	19%	39.4%
White alone, not Hispanic or Latino	64%	36.5%
Families & Living Arrangements		
Persons per household	2.46	2.95
Living in same house 1 year ago, percent of persons age 1 year+	88%	87.1%
Language other than English spoken at home, age 5 years+	27.1%	44.2%
Education		
High school graduate or higher, persons age 25 years+	93%	83.3%
Bachelor's degree or higher, persons age 25 years+	46%	33.9%
Income & Poverty		
Median Household Income (2019 dollars)	$101,342	$75,235
Per capita income in past 12 months (2019 dollars)	$54,682	$36,955
Persons in poverty	6.9%	11.8%
NOTES: (a) Demographic data per the U.S. Census Bureau QuickFacts website (U.S. Census, 2021).		

3.4 Climate

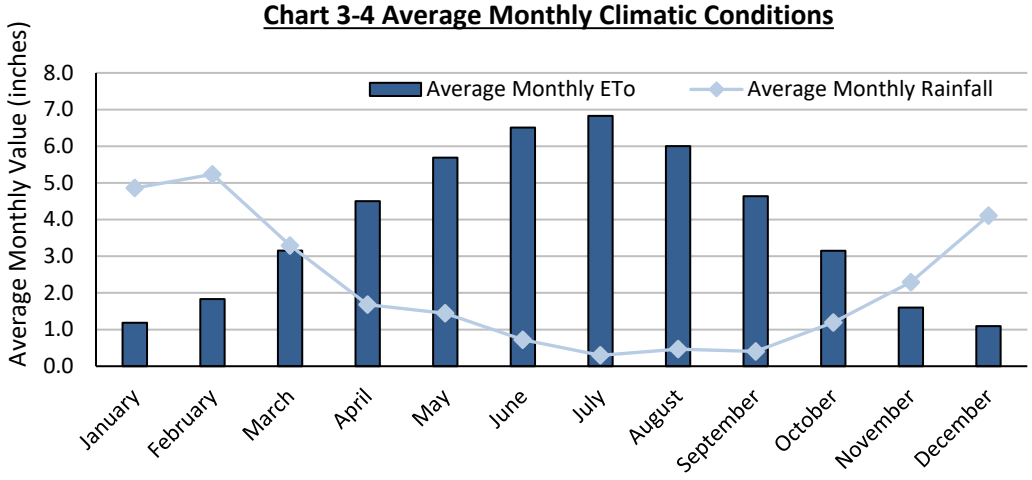
The District's climate is tempered by its proximity to the Pacific Ocean. Similar to much of the California coastal area, the year is divided into wet and dry seasons. Approximately 93% of the annual precipitation normally falls during the wet season, October to May, with a large percentage of the rainfall typically occurring during three or four major winter storms. Winters are cool, and below-freezing temperatures seldom occur. Summers are warm and the frost-free season is fairly long. Annual precipitation averages 26 inches. **Table 3-4** and its associated chart summarizes average monthly evapotranspiration rates (ETo), rainfall, and temperatures from July 1986 to October 2020.

Table 3-4 Average Monthly Climate Characteristics

Month	Average Temperature		Standard Average ETo (inches)	Average Rainfall (inches)
	Min (°F)	Max (°F)		
January	36.7	56.4	1.2	4.9
February	38.9	60.8	1.8	5.2
March	40.7	64.9	3.2	3.3
April	42.6	69.3	4.5	1.7
May	45.4	72.9	5.7	1.4
June	48.7	78.6	6.5	0.7
July	50.9	81.3	6.8	0.3
August	51.1	81.2	6.0	0.5
September	49.0	81.1	4.6	0.4
October	45.0	75.3	3.1	1.2
November	40.0	64.5	1.6	2.3
December	36.2	56.3	1.1	4.1
Annual	**43.8**	**70.2**	**46.2**	**26.0**

NOTES:
(a) Data represents the monthly average from July 1986 to January 2002 recorded from Novato California Irrigation Management Information System (CIMIS) station 63 and from June 2003 to October 2020 recorded from Black Point CIMIS station 187.

Chart 3-4 Average Monthly Climatic Conditions



3.5 Climate Change Considerations

☑ ***CWC § 10630***

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

Impacts associated with climate change are discussed in the *2018 Marin County Multi-Jurisdictional Local Hazard Mitigation Plan* (County LHMP*)*, which is incorporated into this UWMP by reference (Marin County, 2018). The MCM LHMP assesses Marin County's vulnerabilities to various hazards and presents mitigation strategies that are planned over the next five years. As of 2021, Marin County is currently in the process updating its LHMP, using a multijurisdictional planning approach overseen by a steering committee made up of various stakeholders. Risks described in the current County LHMP include flooding, storms, wildfires, and coastal erosion that are anticipated to occur due to climate change.

A further discussion of climate change impacts specific to the SCWA water system is provided in the *Sonoma County Water Agency Local Hazard Mitigation Plan,* dated 16 October 2018, which is also incorporated into this UWMP by reference (SCWA LHMP; SCWA, 2018). The SCWA LHMP specifically assesses SCWA's natural hazard risks and vulnerabilities facing the SCWA infrastructure and provides a plan of action to address these vulnerabilities. As described in the SCWA LHMP, the most significant climate change-related vulnerabilities for SCWA are associated with floods, wildfires, landslides, and drought.

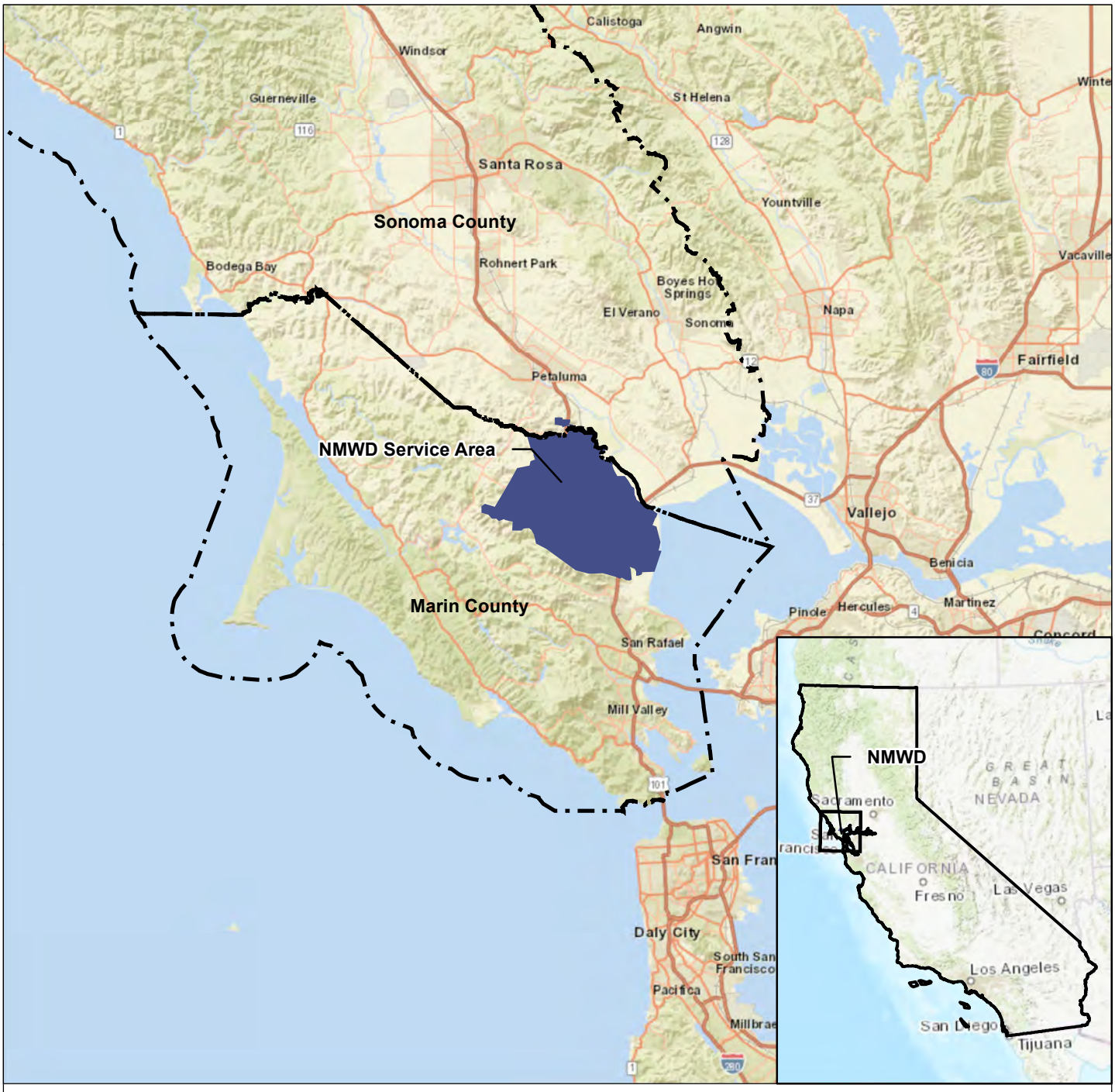
Climate change impacts on the District's water demands are discussed in Section 4.4, while climate change impacts on the District's water supply are discussed in Section 6.10.1.

3.6 Water Distribution System

The District receives the majority of its water supply from the Sonoma County Water Agency's (SCWA's or Sonoma Water's) Russian River Project. The Santa Rosa Aqueduct and the Russian River-Cotati Intertie carry primarily Russian River water from the SCWA diversion facilities located in the Wohler and Mirabel areas to the District via the Petaluma and North Marin Aqueducts. In addition, the SCWA operates three groundwater wells in the Santa Rosa Plain Subbasin (DWR No. DWR Basin 1-55.01) that supplement the water supply from the Russian River. Additional details regarding sources of SCWA supply are included in Chapter 6.

The District maintains a local source of supply, Stafford Lake, in addition to the water purchased from the SCWA. The District operates its Stafford Lake source seasonally to reduce peak demand on the SCWA's Aqueduct system. A map of the District's Novato water system is presented in Figure 3-3 from the 2018 Novato Water System Master Plan Update, provided in **Appendix E**. The District's water supply from Stafford Lake is treated at the Stafford Treatment Plant (STP). Water from Stafford Lake is drawn through an intake tower and, depending on the water surface elevation, is either gravity-fed or pumped to the STP. The STP, which was constructed in 1951, was upgraded in 1973 and completely rehabilitated in 2006. The rehabilitated STP uses chlorine dioxide as a pre-oxidant followed by Actifloc™ ballasted sand clarification with conventional filtration, chlorination and pH adjustment (sodium hydroxide addition) and has a design capacity of 6 million gallons per day (MGD).

The District owns and operates the 30, 36, and 42-inch diameter North Marin Aqueduct, which transports water from the SCWA's Petaluma Aqueduct near Kastania Tank in south Petaluma to Novato. The District has four separate pressure zones, using 31 storage tanks with a total capacity of approximately 37 million gallons, 26 booster pump stations, and seven hydropneumatic systems that have combined tanks and pump stations. More detailed information regarding the District's water storage and transportation system is available in the District's 2018 Water Master Plan (NMWD, 2019). The District's four pressure zones each have gravity storage in one or more storage tanks. Approximately 48% of the total system demand is in Zone 1 and 43% in Zone 2. Zone 1, at the lowest elevation, is supplied by water delivered from the SCWA via the Petaluma Aqueduct and the North Marin Aqueduct, as well as water pumped from STP. Water to supply the other zones is pumped from Zone 1. Transmission mains vary in size from 16 to 24 inches in diameter. Most of the District's distribution pipelines range from 6 to 12 inches in diameter, principally constructed of asbestos cement or polyvinyl chloride, and are up to 65 years old.



Legend

- County Boundary
- North Marin Water District

N

0 10 20

Miles

Regional Vicinity

Abbreviations

NMWD = North Marin Water District

Notes

1. All locations are approximate.

Sources

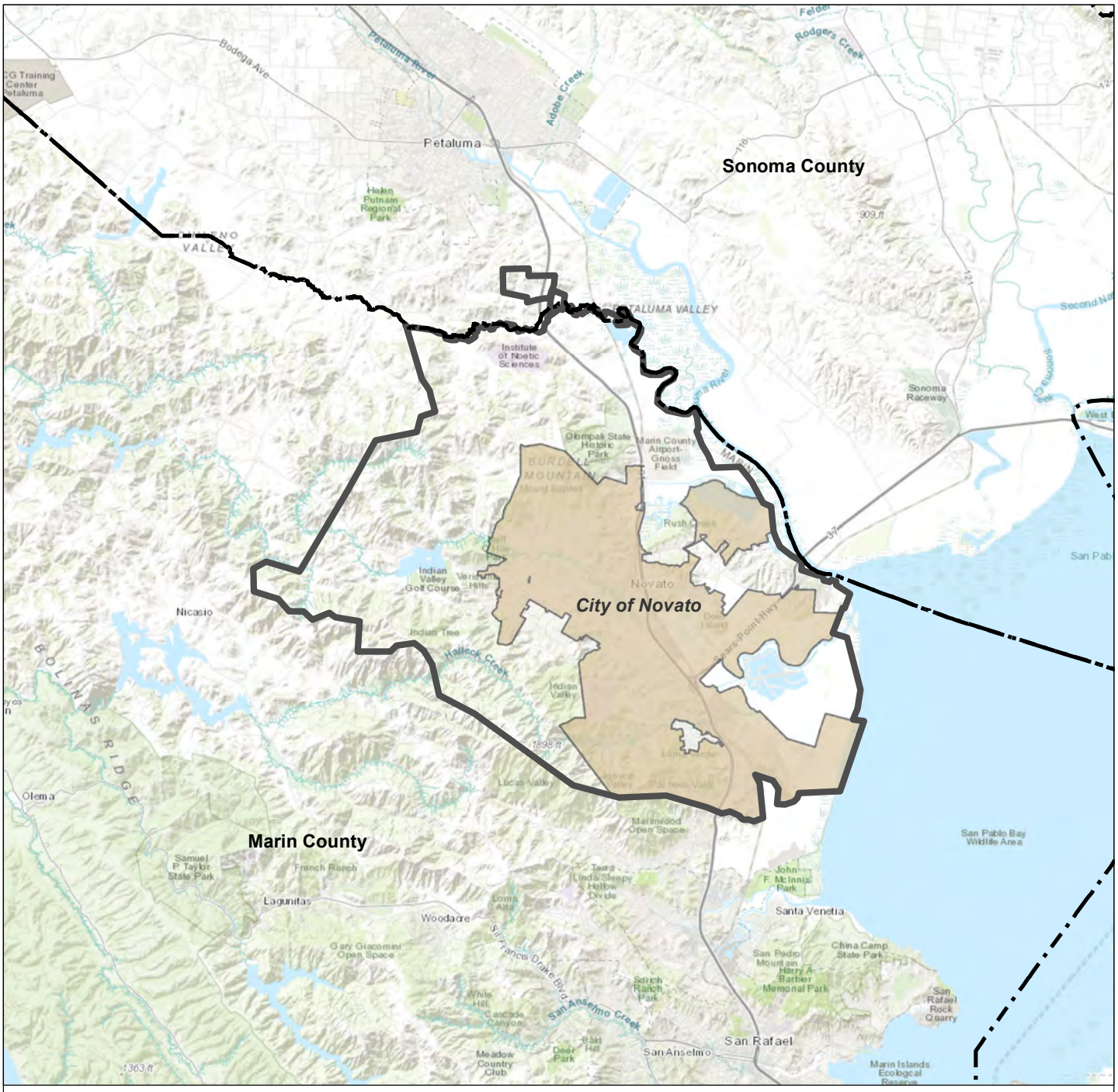
1. Service area boundary provided by North Marin Water District.
2. Basemap provided by ESRI.

eki environment & water

North Marin Water District
June 2021
C00096.00

Figure 3-1

Path: X:\C00096\...00\Maps\2021\06\Fig3-1_RegionalVicinity.mxd



Legend

- County Boundary
- North Marin Water District Service Area
- City of Novato

N

0 3 6

Miles

District Service Area

Notes

1. All locations are approximate.

Sources

1. Service area boundary provided by North Marin Water District.
2. Basemap provided by ESRI.

eki environment & water

North Marin Water District
June 2021
C00096.00

Figure 3-2

Path: X:\C00096\...00\Maps\2021\06\Fig3-2_ServiceArea.mxd

4. SYSTEM WATER DEMANDS

☑ ***CWC § 10631 (d) (1)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

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

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

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

(I) Agricultural.

(J) Distribution system water loss.

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

This section describes and quantifies past and current water use and future water use projections through the year 2045. For purposes of this Urban Water Management Plan (UWMP or Plan), "potable water demand" is defined as the volume of water produced by North Marin Water District (NMWD or District) to serve the Novato Water System, including purchased Sonoma County Water Agency (SCWA or Sonoma Water) water and local Stafford Lake water treated by the District. The District also serves raw and recycled water to customers, referred to herein as "non-potable water demand".

Among other factors, water demand is dependent on climate, population, industry, and the types of development present in a community. Sections 4.1 and 4.2 describe the District's historical and projected water uses for residential, commercial, institutional, and landscape irrigation purposes (water use sectors A, B, C, E, and F, per §10631(e)(1)), as well as raw and recycled water uses. Distribution system water loss (water use sector J) is discussed in Section 4.1.3. As described in Section 4.3, this discussion does not include demands for water use sectors D, G, H, and I as they are not applicable or present within the District's service area. Section 4.4 describes anticipated climate change impacts to demand, and Section 4.5 discusses future urban water use objective requirements. Note that water demand projections are presented based on the current best available information and are subject to review and revision every 5 years as part of the update process.

4.1 Current and Historic Total Water Demand

The following sections of the Urban Water Management Plan (UWMP or Plan) present the District's current and historical water demands, as well as the projected future demand in five-year increments from 2025 through 2045.

4.1.1 Current and Historical Potable Water Demand

Current and historical potable water demand by water use sector from 2016 through 2020 is shown in **Table 4-1**, along with its associated charts.[6] Water demand within the District is primarily measured using water meters that are installed at each customer account. Records of water use are maintained by the District and are based on billing data. Water use within the District is tracked for the following sectors:

- Single Family Residential (SFR);
- Multi-Family Residential (MFR);
- Commercial;
- Institutional/Governmental;
- Landscape; and
- Other.

Water use within the District's service area is predominantly associated with residential use, with 56% of the water use between 2016 and 2020 from SFR accounts and 14% from MFR accounts. Commercial accounts comprised 10% of total water use, landscape accounts comprised 9.0%, and institutional/governmental comprised 2.9%. As shown in **Table 4-2** and its associated charts, the total and per capita water use increased from 2011 through 2013, then declined from 2014 through 2017. These trends were likely influenced by the historic drought conditions, mandatory state-wide restrictions in urban water use imposed by the State Water Resources Control Board (SWRCB), and local drought response. Total and per capita water use has remained lower than pre-drought conditions, with an increase in 2018, indicating a degree of rebound following the drought.

[6] Historical demand is reported herein on a fiscal year basis, and in the *2020 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update* (EKI, 2020; **Appendix B**) on a calendar year basis.

Table 4-1 Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1)

Use Type	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume				
			2016	2017	2018	2019	2020
Single Family		Drinking Water	3,899	4,176	4,870	4,495	4,863
Multi-Family	Apartments, condos, and mobile homes	Drinking Water	1,073	1,087	1,124	1,116	1,160
Commercial		Drinking Water	781	799	885	843	816
Institutional/Governmental		Drinking Water	176	170	211	371	210
Landscape		Drinking Water	609	689	845	699	719
Other Potable	Pools, fire services	Drinking Water	144	72	87	86	90
Losses	(c)	Drinking Water	680	193	124	295	--
Other Potable	Other non-revenue water (d)	Drinking Water	36	21	21	20	74
Other Non-Potable	Raw water	Raw Water	153	186	193	186	202
Other Potable	Potable water make-up to recycled water system	Drinking Water	16	1.6	49	6.8	60
		TOTAL	7,568	7,395	8,408	8,117	8,194

NOTES:
(a) Volumes are in units of AF.
(b) Water demand is based upon metered water consumption.
(c) "Losses" for 2016 through 2019 are the "water losses" estimated using the AWWA Free Water Audit Software and includes both real and apparent losses, reported on a calendar-year basis.
(d) "Other non-revenue water" includes authorized but unbilled, unmetered consumption that do not fall under the category of “losses”, such as fire flow, system flushing, hydrant leaks, etc. Other non-revenue water for 2016 through 2019 is calculated as the difference between “water losses” and “non-revenue water” as reported in the AWWA Water Loss Worksheets and is reported on a calendar-year basis. For 2020 where the AWWA Water Loss Worksheet was unavailable, non-revenue water is calculated as the difference between FY 2020 production and consumption.

Chart 4-1A Annual Water Demand by Sector: 2016-2020

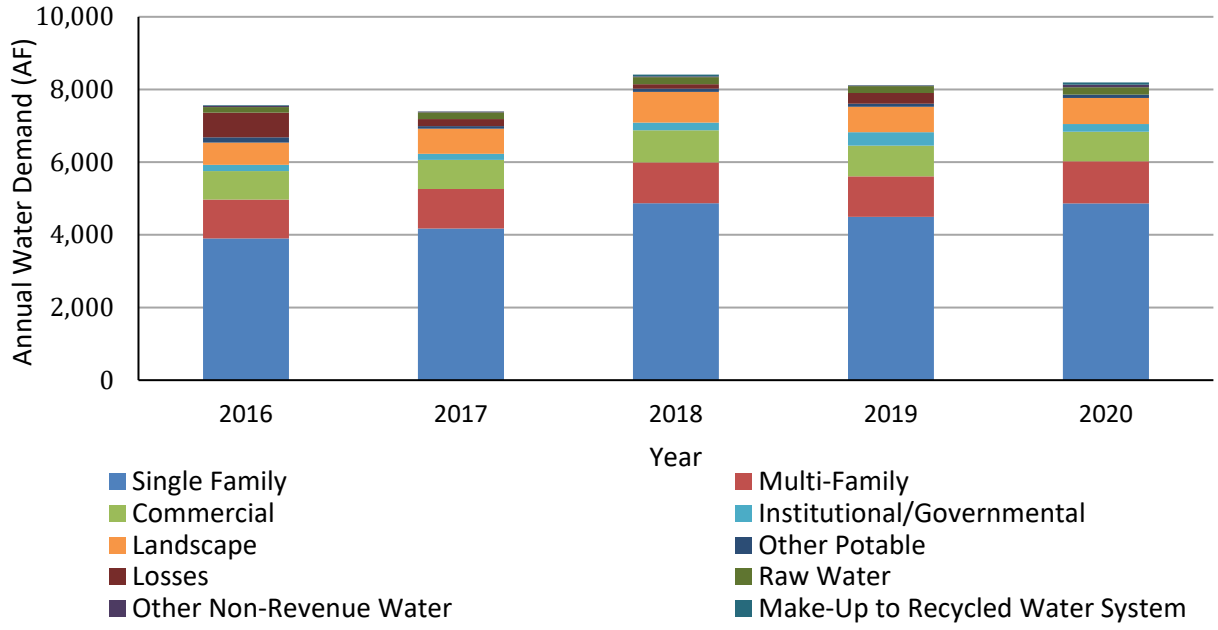


Chart 4-1B Percentage of Total Water Demand by Sector: 2016-2020

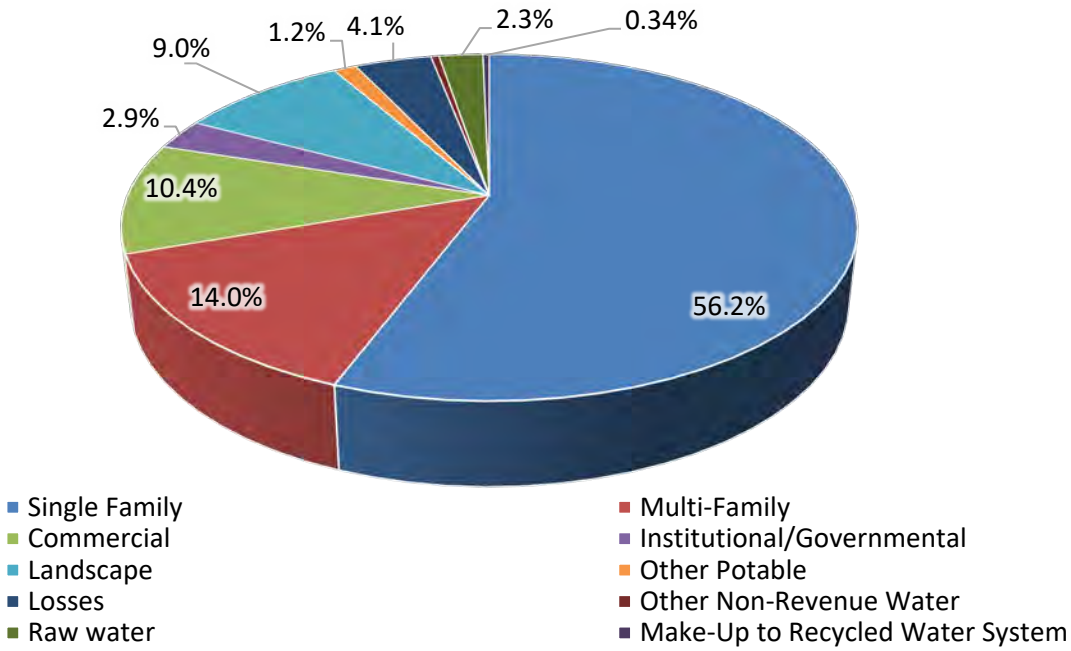
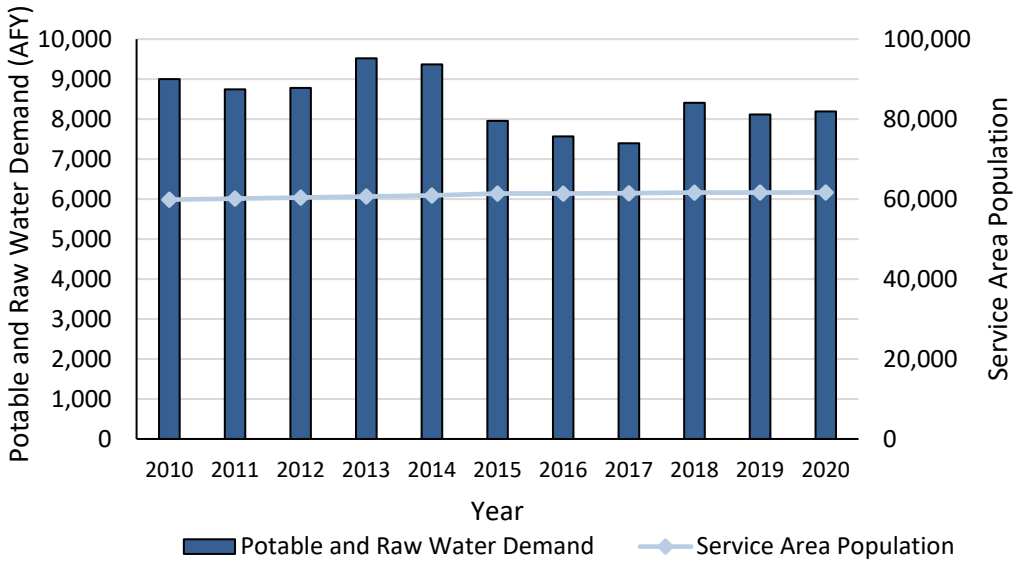


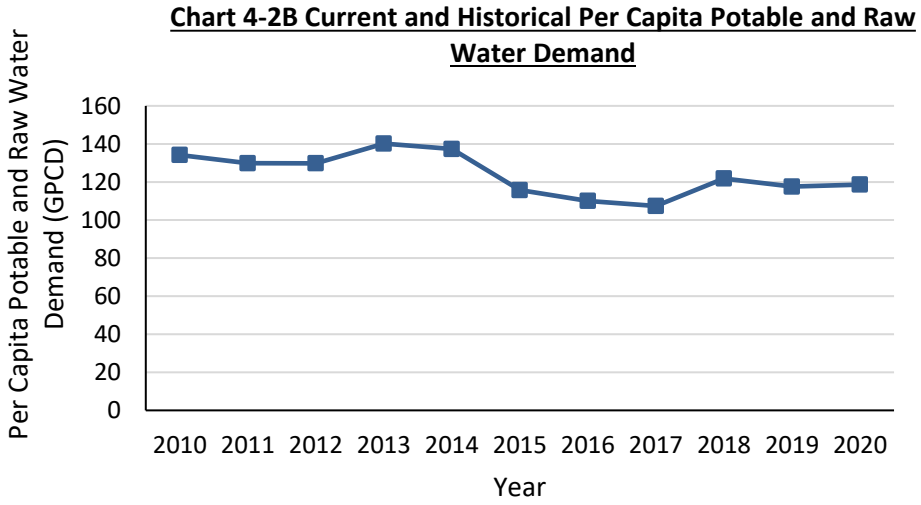
Table 4-2 Historical and Current Potable Water Demand and Population

Year	Potable and Raw Water Demand (AFY)	Service Area Population	Per Capita Potable and Raw Water Demand (GPCD)
2010	8,999	59,861	134
2011	8,744	60,119	130
2012	8,779	60,377	130
2013	9,521	60,635	140
2014	9,369	60,893	137
2015	7,958	61,381	116
2016	7,568	61,386	110
2017	7,395	61,470	107
2018	8,408	61,616	122
2019	8,117	61,637	118
2020	8,194	61,658	119

NOTES:
(a) Detailed historical and current water demand data from 2016 through 2020 are documented in **Table 4-1**.
(b) Service area population for 2010 through 2020 per **Appendix B**.

Chart 4-2A Current and Historical Water Demand and Population





4.1.2 Current and Historical Non-Potable Water Demand

As described below, there are two sources of non-potable demand within the District: (1) raw water and (2) recycled water demands.

Raw water demand within the District represented a small fraction (i.e., approximately 2.3%) of total average water demand from 2016 through 2020 (**Table 4-1**). The District provides raw (untreated) water for landscape irrigation to two customers (Marin County – Stafford Lake Park and Indian Valley Golf Course). As shown in Section 4.2.2, raw water demand is projected to remain constant throughout the planning period.

Annual recycled water demand represented approximately 7% of total average water demand from 2016 through 2020. Recycled water demands are primarily associated with outdoor irrigation and therefore occur primarily between the months of April and October. As such, the actual maximum day supply of recycled water can represent up to 16% of the District's total demand during summer months. For additional projected demand information related to recycled water, refer to Section 4.2 and to Section 6.3.

4.1.3 Potable Water Make-Up to the Recycled Water System

The recycled water system is supplemented with potable water to meet demands, as necessary. This potable make-up represented up to 60 AFY (less than 1%) of total potable water demand from 2016 through 2020. The District receives recycled water from two recycled water systems: the Novato Sanitary District (NSD) and the Las Gallinas Valley Sanitary District (LGVSD). In 2020, the LGVSD recycled water system was shut down to allow for treatment plant upgrades and 100% of recycled water demand was met by potable water. Following the completion of treatment plant upgrades in April 2021, the District anticipates that all demand by the recycled water system will be met by recycled water. The recycled water system is discussed in further detail in Section 6.3.

4.1.4 Distribution System Water Loss

☑ *CWC § 10631 (3)*

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

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

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

Distribution system water losses for the previous five years are summarized in **Table 4-3**. Water loss is the sum of apparent and real losses. Apparent losses include metering inaccuracies, systematic data handling errors, and unauthorized consumption. Real losses represent water loss attributable to the distribution system and include physical water losses from the pressurized system and storage tanks up to the point of customer consumption. Since 2016, urban retail water suppliers have been required under CWC §10608.34 and California Code of Regulations (CCR) § 638.1 et seq to quantify distribution system water losses using the American Water Works Association (AWWA) Free Water Audit Software (referred to as the "AWWA Water Loss Worksheet"). The real and apparent losses calculated in the most recent AWWA Water Loss Worksheet are provided in **Table 4-3,** and are available through DWR's Water Use Efficiency Data Portal.[7] Since the 2020 AWWA Water Loss Worksheet was not available during production of this document, losses for 2020 are estimated as the difference between water production and consumption. **Table 4-1** reports these real and apparent losses as "Losses", as well as "Other Non-Revenue Water" which includes other unbilled water uses such as system flushing, leak repair flushing, hydrant leaks, and street sweeping and is calculated as the difference between "water losses" and "non-revenue water" as reported in the AWWA Water Loss Worksheets.

CWC §10631 (3)(c) requires that this UWMP demonstrate whether the distribution loss standards enacted by the SWRCB pursuant to §10608.34 have been met. However, the SWRCB has yet to establish these standards, and thus consistency with these standards cannot be demonstrated herein.

[7] DWR's Water Use Efficiency Data Portal is located at: https://wuedata.water.ca.gov/awwa_plans.

Table 4-3 Last Five Years of Water Loss Audit Reporting (DWR Table 4-4)

Reporting Period Start Date	Volume of Water Loss
07/2014	238
01/2016	680
01/2017	193
01/2018	124
01/2019	295
NOTES: (a) Volumes are in units of AF. (b) Water loss was estimated using the AWWA Free Water Audit Software and includes both real and apparent losses. Water loss is reported on a fiscal-year basis for 2014/15 and on a calendar-year basis for 2016 through 2019.	

4.2 Projected Total Water Demand

The District's water demand projections were prepared as part of the *2020 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update* (Water Demand Report; EKI, 2020), which is provided in **Appendix B** and documents in detail the methods and assumptions used to project future water demand.

Projected total water demand is summarized in the following subsections.

4.2.1 Projected Potable Water Demand

As described in more detail below and in the Water Demand Report (**Appendix B**), projected water demands for the District were estimated by:

- Applying an estimated growth rate to the number of accounts within each water use sector based on projected population and employment growth rates,
- Identifying known planned developments within the District, including new housing per the Association of Bay Area Governments' (ABAG) Regional Housing Needs Allocation (ABAG, 2020) to verify that account growth projections consider all currently anticipated growth,
- Evaluating and selecting water demand factors for each water use sector based on review of recent average per account water use representing three scenarios (i.e., pre-drought conditions, post-drought conditions, and a partial drought rebound scenario),
- Estimating future passive savings using the Alliance for Water Efficiency (AWE) Water Conservation Tracking Tool (AWE model), and
- Calculating estimated future water demand that incorporates the anticipated account growth, water demand factors, and estimated future passive water savings.

This methodology is consistent with CWC §10631(d)(4)(A), which requires that "water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area." The assumptions used as the bases for demand projections were developed in close coordination with the District and reflect a land-use based approach consistent with community planning within the District.

Projected customer water demands for years 2025 through 2045 are presented in **Table 4-4** along with its associated chart. These demands are broken down by sector, including water loss, raw water, and potable make-up to the recycled water system. Recycled water demands are not included in **Table 4-4** and are discussed in Section 6.3. As affirmed in **Table 4-5**, both future water savings (Section 4.2.4) and lower income residential demands (Section 4.2.3) are included in the projections of future water use.

Table 4-4 Use for Potable and Non-Potable Water - Projected (DWR Table 4-2)

Use Type	Additional Description *(as needed)*	Projected Water Use				
		2025	2030	2035	2040	2045
Single Family		5,928	6,072	6,271	6,308	6,355
Multi-Family	Apartments, condos, mobile homes	1,278	1,263	1,264	1,243	1,230
Commercial		932	930	919	906	896
Institutional/ Governmental		297	299	299	297	295
Landscape		1,001	1,024	1,035	1,038	1,040
Other Potable	Pools, fire services	129	133	136	138	139
Losses	(b)	301	311	322	325	329
Other Non-Potable	Raw Water (c)	218	218	218	218	218
TOTAL		10,084	10,249	10,463	10,472	10,502

NOTES:
(a) Volumes are in units of AF.
(b) Projected water demands were estimated using methodology described in **Appendix B** and incorporate passive conservation savings, as described in Section 4.2.4.
(c) Losses represent all non-revenue water, which includes both real and apparent losses, including unauthorized consumption.
(d) Raw water projections are based on past raw water usage.

Chart 4-4 Current and Projected Water Demand by Sector

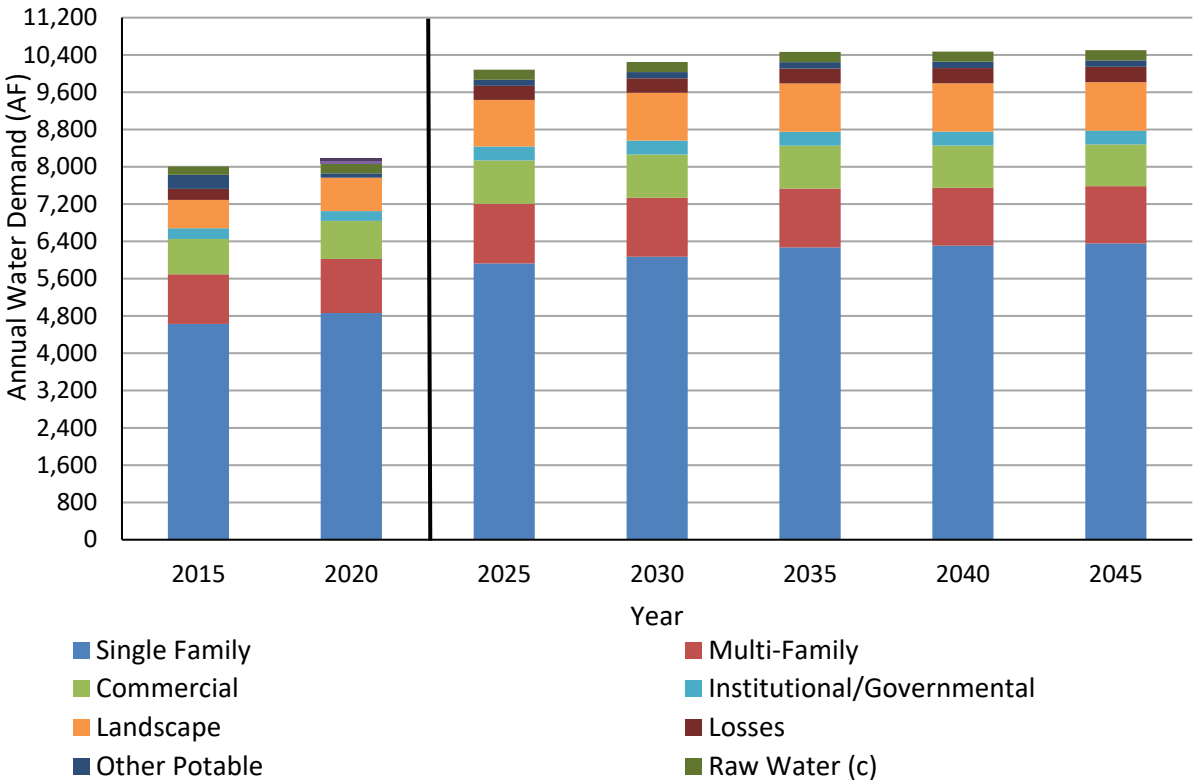


Table 4-5 Inclusion in Water Use Projections (DWR Table 4-5)

Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Refer to Section 4.4 and Table 4-6 of **Appendix B**.
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

4.2.2 Projected Non-Potable Water Demand

As indicated in **Table 4-4** and discussed in Section 4.1.2, raw water demand is currently served to two customers and is not expected to change over the current planning period.

The recycled water system is separate from the potable water system and has a more limited footprint within the District. Expansion of recycled water use is generally dependent on (1) location and proximity to the recycled water distribution system, (2) the presence of substantial enough opportunities for use of non-potable water (i.e., irrigation and some small commercial uses such as automatic, drive through car

washes) to warrant connection to the recycled water distribution system, and (3) the capacity of the recycled water treatment facility and distribution system to meet the available demand. Due to these factors, while some recycled water use may be expected to increase relative to population or employment growth within the District, system infrastructure is a more significant driver in projecting future recycled water use. Projected recycled water demand is not included in **Table 4-4** and is shown in Section 4.2.5 and further described in **Appendix B**.

4.2.3 Water Use for Lower Income Households

☑ ***CWC § 10631.1***

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

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirements under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

California Senate Bill No. 1087 (SB 1087), Chapter 727, was passed in 2005 and amended by Government Code Section 65589.7 and Water Code Section 10631.1. SB 1087 requires local governments to provide a copy of their adopted housing element to water and sewer providers. In addition, it requires water providers to grant priority for service allocations to proposed developments that include housing units for lower income families and workers. Subsequent revisions to the UWMP Act require water providers to develop water demand projections for lower income single and multi-family households.

NMWD does not discriminate in terms of supplying water to any development. NMWD is required to serve any development that occurs within its service area, regardless of the income level of the future residents. It is ultimately the City's or County's responsibility to approve or not approve developments within the service area.

As indicated in **Table 4-5**, the water use projections presented in Section 4.2.1 and **Table 4-4** include projected water use by lower income households. A lower income household is defined under California Health and Safety Code §50079.5(a) to be 80% of median income, adjusted for family size. Based on Census data for the Novato service area, the 80% of median income figure is approximately $81,100.[8] The ABAG 2023-2031 Regional Housing Needs Allocation (RHNA) Proposed Methodology for the San Francisco Bay Area (ABAG, 2020) was used to estimate the proportion of new lower income households anticipated within the District. Based on ABAG (2020) data for the City of Novato, new lower income households are estimated to comprise approximately 44% of the total new households. **Table 4-6** shows the projected

[8] US Census Bureau American Fact Finder for City of Novato using 2015-2019 American Community Survey 5-Year Estimates (in 2019 dollars). Median income estimate is $101,342.

water demands for lower income households based on 44% of the total single-family and multi-family residential projected water uses included in **Table 4-4.**

Table 4-6 Projected Water Use for Lower Income Households

Lower-Income Water Demand Sector	Projected Water Use (AFY)				
	2025	2030	2035	2040	2045
Single Family Residential	2581	2644	2730	2746	2767
Multi-Family Residential	557	550	550	541	535
Total	3,138	3,194	3,281	3,288	3,303
NOTES: (a) Volumes are in units of AF.					

4.2.4 Water Savings from Codes, Standards, Ordinances, or Transportation and Land Use Plans

☑ ***CWC § 10631 (d) (4)***

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

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

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

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

"Passive conservation" refers to water savings resulting from actions and activities that do not depend on direct financial assistance (e.g., rebate) programs from the District. These savings result primarily from (1) the natural replacement of existing plumbing fixtures with water-efficient models required under current plumbing code standards, and (2) the installation of water-efficient fixtures and equipment in new buildings and retrofits as required under CALGreen Building Code Standards and the District's strict enforcement of new development water use efficiency requirements in District Regulation 15 sections e. and f.[9] The water use projections discussed in Section 4.2.1 and summarized in **Table 4-4** include water savings associated with these codes and standards. Specifically, as shown in **Table 4-7** and its associated chart, passive water savings for the District were calculated to be 749 AFY by 2045 using the Alliance for

[9] The District Regulation 15 is available at the District's website: https://nmwd.com/wp-content/uploads/2020/04/Reg-15-1.pdf.

Water Efficiency (AWE) Water Conservation Tracking Tool (referred to as the AWE model; AWE, 2016). The AWE model is an industry standard tool that incorporates historical population, residential building stock, number of accounts, and projected population and account growth to estimate future passive savings. More information regarding the passive savings estimated using the AWE model can be found in **Appendix B**.

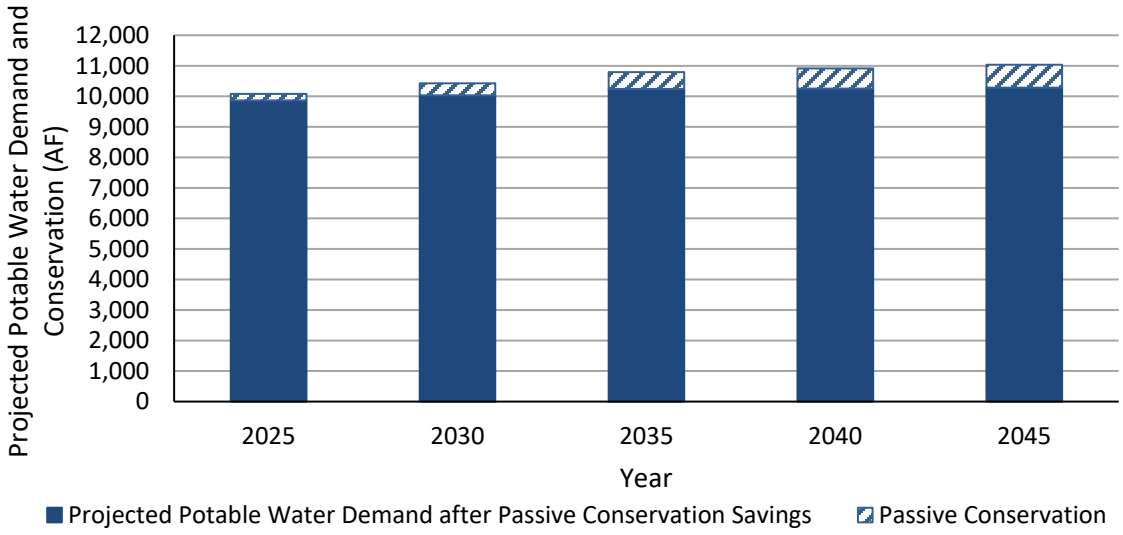
While projections account for passive savings, the District has taken a more conservative approach to demand projections by not accounting for savings associated with future active conservation measures. However, savings associated with all past active conservation efforts are embedded into the demand projections. This approach is conservative, as it projects the highest level of probable demand. Active conservation thus increases resiliency for District customers by further increasing efficient utilization of available supplies.

Table 4-7 Projected Total Water Demand and Projected Passive and Active Water Conservation

Water Conservation Type	Projected Total Water Demand				
	2025	2030	2035	2040	2045
Projected Water Demand	10,082	10,427	10,795	10,913	11,033
Projected Water Conservation	216	396	550	659	749
Passive Conservation	9,866	10,031	10,245	10,254	10,284

NOTES:
(a) Volumes are in units of AF.
(b) The District also implements a number of active conservation programs, as discussed in Chapter 9 and **Appendix B**.

Chart 4-7 Projected Potable Water Demand and Conservation



4.2.5 Projected Total Water Demand

The District's total projected water demands are summarized in **Table 4-8**.

Table 4-8 Total Water Use (Potable and Non-Potable) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045
Potable Water, Raw, Other Non-potable *From DWR Tables 4-1 and 4-2*	8,194	10,084	10,249	10,463	10,472	10,502
Recycled Water Demand *From DWR Table 6-4*	658	595	508	622	636	650
TOTAL WATER USE	8,852	10,679	10,757	11,085	11,108	11,152
NOTES: (a) Volumes are in units of AF.						

4.3 Water Use Sectors Not Included in the Demand Projections

Several water use sectors listed in CWC §10631(e)(1) are not included in the water demand projections described in Sections 4.2.1 and 4.2.2 because they are not applicable to the District. The following sectors were not included in the demand projections in this Plan:

- Industrial (CWC §10631(e)(1)(D)) – The District does not currently, nor does it plan to, provide water for industrial uses. The District does provide water for some biopharmaceutical industrial purposes, but this use is included in the commercial sector and not tracked separately.
- Sales to Other Agencies (CWC §10631(e)(1)(G)) – The District does not currently, nor does it plan to, sell water to other agencies.
- Saline Water Intrusion Barriers, Groundwater Recharge, or Conjunctive Use (CWC §10631(e)(1)(H)) – The District does not currently use, nor does it plan to use, water for saline water intrusion barriers, groundwater recharge, or conjunctive use.
- Agricultural (CWC §10631(e)(1)(I)) – The District does not currently, nor does it plan to, provide water for agricultural uses.

4.4 Climate Change Impacts to Demand

☑ ***CWC § 10635(b)***

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

The methodology used to develop demand projections herein considers the impacts of climate change on projected demands. California experienced a historic drought between 2011-2017. In 2014, Governor Brown issued Executive Order B-26-14 declaring a Drought State of Emergency and requested all

Californians to voluntarily reduce water use by 20%. In 2015, the State Water Resources Control Board implemented emergency conservation regulations that, among other things, required water agencies to reduce their water use and prohibited certain types of water uses. As a result, the District experienced an overall decrease in demands during the historic drought, most significantly during 2015. As explained further in **Appendix B**, the demand factors evaluated herein consider both the 2011-2013 period, in which customers increased their water use (in part due to the drought conditions, prior to the imposed restrictions), as well as the observed rebound in demand following the drought (2017-2019). Thus, the periods used to develop the demand projections reflect conditions representative of the hotter, drier weather expected as a result of climate change.

4.5 Urban Water Use Objectives (Future Requirements)

☑ ***CWC § 10609.20***

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

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

☑ ***CWC § 10609.22***

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

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

☑ ***CWC § 10609.24***

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

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

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

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

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

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

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

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

Beginning in 2023, urban water retailers will be required to report on "annual water use objectives" by 1 November of each year and to achieve these objectives by 1 January 2027. The annual water use objectives will be calculated based on standards for indoor residential water use, outdoor residential water use, and distribution system water loss. Additionally, it is anticipated that performance-based standards for the commercial, industrial, and institutional sectors, separate from the annual water use

objectives, will also be developed by Department of Water Resources (DWR) and be implemented in the future. However, the specific standards that will be used to determine a retailer's annual urban water use objectives are currently under development by DWR, and thus the annual urban water use objectives for the District cannot be calculated or estimated. Once the urban water use objectives are released, the District will evaluate its historical and current water use compared to the new objectives, and will evaluate the need to adjust its conservation and water loss management measures to meet the new objectives.

One of the components for calculating the future water use objectives is provided for in CWC §10609.4.(a), which states "(1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily. (2) Beginning January 1, 2025, and until January 1, 2030, the standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard recommended pursuant to subdivision (b). (3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b)."[10] **Table 4-9** shows an estimate of future per capita residential water use, broken out by estimated indoor and outdoor water use, per the analysis provided in **Appendix B**. Based on these estimates, per capita indoor residential potable water use is expected to be above the indoor use standards presented in the legislation. Although indoor residential water use is expected to be above the indoor residential water use standard, it should be noted that because standards have not yet been developed for the outdoor water use or water loss components of the future water use objectives, it cannot be known whether projected demands for the District will be in compliance with the pending requirements.

[10] While the legislation appears to be clear on the method to calculate the indoor residential water use component, the SWRCB has begun the California Environmental Quality Act (CEQA) process for the new water use objective requirements and has expressed concern that using the 55 gallons per capita per day (GPCD) number in the legislation will constitute "backsliding" (compared to the reduction required by SB X7-7) and thus may need to be lowered.

Table 4-9 Current and Projected Residential Per Capita Water Use

Year	Residential Potable Water Demand	Service Area Population	Per Capita Residential Potable Water Use (GPCD)	Approximate Per Capita Indoor Residential Potable Water Use (GPCD)	Approximate Per Capita Outdoor Residential Potable Water Use (GPCD)
2020	6,024	61,658	87	52	35
2025	7,206	63,389	101	61	41
2030	7,335	65,440	100	60	40
2035	7,535	67,838	99	60	40
2040	7,551	68,631	98	59	39
2045	7,585	69,432	98	59	39

NOTES:
(a) Unless otherwise noted, volumes are in units of AF.
(b) The approximate proportion of indoor and outdoor water use is based on the average estimated residential indoor and outdoor water use from 2017 through 2019 (60% indoor and 40% outdoor) as documented in **Appendix B.**

5. BASELINE WATER USE AND SB X7-7 WATER CONSERVATION TARGETS

☑ ***CWC § 10608.24 (b)***

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☑ ***CWC § 10608.28***

(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

With the adoption of the Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7, the state was required to reduce urban water use by 20% by the year 2020. Each urban retail water supplier was required to develop a baseline daily per capita water use ("baseline water use") in their 2010 Urban Water Management Plan (UWMP or Plan) and establish per capita water use targets for 2015 and 2020 in order to help the state achieve the 20% reduction. Under SB X7-7 urban retail water suppliers may either comply with their 2020 targets on an individual basis or as part of a regional Alliance. As identified in **Table 2-2**, although North Marin Water District (NMWD or District) is part of the North Marin-Sonoma Alliance (referred to as "Alliance" herein).

In support of implementing the requirements of SB X7-7, the California Department of Water Resources (DWR) produced a set of methodologies for developing baseline and compliance water use and targets, which are included in Methodologies for Calculating Baseline and Compliance Urban Per Capita Water, California Department of Water Resources Division of Statewide Integrated Water Management Water Use and Efficiency Branch, (Methodologies; DWR, 2016). The District has not made any changes to the information pertaining to the baseline water use or interim 2015 target compliance reported in the District's 2015 UWMP.

In this chapter, the District demonstrates compliance with its 2020 per capita water use target. As part of the compliance reporting for SB X7-7, water suppliers are required to complete and submit a set of standardized verification tables in their 2020 UWMPs. The information in these tables is discussed and

summarized in the following subsections, and the complete set of SB X7-7 standardized tables is included in **Appendix F**.

5.1 Service Area Population

☑ ***CWC § 10608.20 (e)***

An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

☑ ***CWC § 10608.20 (g)***

An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

☑ ***Methodology 2 Service Area Population****.*

DWR will examine discrepancy between the actual population estimate and DOF's projections for 2010; if significant discrepancies are discovered, DWR may require some or all suppliers to update their baseline population estimates. (DWR, 2016)

As stated previously herein, the District's service territory includes not only the city of Novato but also the adjacent surrounding unincorporated area and includes a limited number of customers served outside of the NMWD service territory in south Sonoma County[11]. In previous UWMPs, the District developed baseline population estimates using Census Block Group data to develop service area populations. As reported in the 2015 UWMP, it was determined that a more simplified yet equally precise methodology could be applied using the District's Dwelling Unit (DU) database. The same methodology used in the 2015 UWMP was used to calculate 2020 population, using a 2020 estimate for the number of dwelling units. The District's 5- and 10-year baseline populations, as reported in the 2015 UWMP are presented in **Table 5-1** below.

[11] The District also operates the West Marin Water System, which is a separate public water system with a separate source of supply and no physical interconnection of facilities between the Novato and West Marin Water System. Only information regarding the Novato Water System is included herein.

Table 5-1 SB X7-7 Service Area Population

Year		Population
10 to 15 Year Baseline Population		
Year 1	1995	52,762
Year 2	1996	51,809
Year 3	1997	51,950
Year 4	1998	52,073
Year 5	1999	53,119
Year 6	2000	54,099
Year 7	2001	54,712
Year 8	2002	56,196
Year 9	2003	56,358
Year 10	2004	57,527
5 Year Baseline Population		
Year 1	2003	56,358
Year 2	2004	57,527
Year 3	2005	59,146
Year 4	2006	60,357
Year 5	2007	60,474
2020 Compliance Year Population		
2020		61,658
NOTES:		

5.2 Baseline Water Use

5.2.1 Individual Baseline Water Use

The baseline water use is the water supplier's average gross daily water use per capita measured in gallons. This baseline includes all water entering the delivery system, including water losses.[12] Water suppliers were required to define a 10- or 15-year base (or baseline) period for water use that was then used to develop their future target per capita water use in their 2010 and 2015 UWMPs.[13] Water suppliers were also required to calculate their water use over a five-year baseline period and use that value to determine a minimum required reduction in water use by 2020.

[12] A water supplier may deduct from its gross water use water conveyed to other urban water suppliers, water placed into long-term storage, recycled water delivered within the supplier's service area, water delivered for agricultural use, water conveyed to other urban water suppliers, and water used for industrial processes.

[13] Utilizing a 15-year baseline period is only allowed for water suppliers that meet at least 10% of their 2008 measured retail water demand through recycled water; the District does not meet this criterion and thus selected a 10-year baseline.

5.2.2 Regional Baseline Water Use

For the development of the District's baseline water use, a 10-year average was used from 1995 to 2004. The 10-year baseline water use calculated and reported in the District's 2015 UWMP was 173 gallons per capita per day (GPCD). No deductions were made to the District's gross water use. The District was also required to determine its five-year base daily per capita water use in its prior UWMPs, which was determined to be 162 GPCD.

Table 5-2 below shows the weighted baseline as calculated for the Alliance in 2015. Taking the population-weighted average of all of its members, the Alliance's baseline was calculated to be 156 GPCD.

Table 5-2 RA1 – Weighted Baseline

SB X7-7 RA1 - Weighted Baseline				
Participating Member Agency Name	**10-15 year Baseline GPCD***	**Average Population During 10-15 Year Baseline Period**	**(Baseline GPCD) X (Population)**	**Regional Alliance Weighted Average 10-15 Year Baseline GPCD**
City of Cotati	159	6,559	1,043,146	
Marin Municipal Water District	149	178,670	26,690,318	
North Marin Water District	173	54,061	9,370,435	
City of Petaluma	180	52,622	9,491,997	
City of Rohnert Park	161	40,811	6,582,847	
City of Santa Rosa	145	143,109	20,806,963	
City of Sonoma	225	9,679	2,173,212	
Valley of the Moon Water District	146	20,969	3,058,648	
Town of Windsor	156	24,572	3,834,809	
Regional Alliance Total	1,495	531,051	83,052,375	**156**

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

NOTES

5.3 Water Use Targets

☑ ***CWC § 10608.20 (b)***

An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2017 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

☑ ***CWC § 10608.22***

Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

5.3.1 Individual Water Use Targets

Table 5-3 shows the District's 5- and 10-year baseline periods, its baseline GPCD for these periods, and its confirmed 2020 target, which were previously developed and reported in its 2015 UWMP. This individual target is used for the development of the Alliance's regional water use target, as shown in Section 5.3.2.

Table 5-3 Baselines and Targets Summary (DWR Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target GPCD
10-15 year	1995	2004	173	139
5 Year	2003	2007	162	
NOTES:				

5.3.2 Regional Water Use Targets

Instead of, or in addition to, individual water use targets, urban water retail suppliers may plan, comply, and report on SB X7-7 requirements on a regional basis as part of a "Regional Alliance." As described in Section 2.2.2, the District is one of eight Water Contractors to the Sonoma County Water Agency (SCWA or Sonoma Water) for purchase of Russian River water supply. As such, the Water Contractors formed a regional in 2011 Alliance under the provisions of SB X7-7 because they are recipients of water from a common wholesale water supplier.

The membership of the Alliance is consistent with that of a previously established water conservation regional partnership of eight Water Contractors, known as the Sonoma Marin Saving Water Partnership (SMSWP). As identified in **Table 2-2**, this regional group, which collaborates on regional water conservation efforts, formed a Regional Alliance for the purposes of meeting regional water use targets. The members of the North-Marin Sonoma Alliance include: the District, City of Sonoma, City of Santa Rosa, Town of Windsor, City of Rohnert Park, City of Cotati, City of Petaluma, Marin Municipal Water District, and Valley of the Moon Water District[14].

The DWR established three options for calculating a regional Alliance water use target. The District, along with the other Water Contractors in the regional Alliance , selected Option 1, which preserves maximum flexibility at the supplier level. Under Option 1, each member of the regional Alliance calculates their individual targets and then weighs the individual targets by each member's population. The weighted targets are then averaged to determine the regional Alliance Target. Detailed calculations conducted by the Regional Alliance are included in **Appendix F**. The Alliance's 2020 Target, as reported to DWR by the Alliance in 2015, are provided in **Table 5-4** below.

[14] The letter approving the District's membership in the regional Alliance is available at the following link: http://www.savingwaterpartnership.org/wp-content/uploads/20x2020-regional-alliance-agreement.doc.pdf.

Table 5-4 DWR Regional Alliance Weighted 2020 Target

SB X7-7 RA1 - Weighted 2020 Target				
Participating Member Agency Name	**2020 Target GPCD***	**2015 Population**	**(Target) X (Population)**	**Regional Alliance Weighted Average 2020 Target**
City of Cotati	130	7,288	947,440	
Marin Municipal Water District	124	189,000	23,436,000	
North Marin Water District	139	61,381	8,531,959	
City of Petaluma	141	61,798	8,713,518	
City of Rohnert Park	119	41,675	4,959,325	
City of Santa Rosa	126	173,071	21,806,946	
City of Sonoma	180	11,147	2,006,460	
Valley of the Moon Water District	124	23,478	2,911,272	
Town of Windsor	130	27,486	3,573,180	
Regional Alliance Total	1,213	596,324	76,886,100	**129**
**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6, Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*				
NOTES:				

5.4 2020 Target Compliance

☑ ***CWC § 10608.24 (b)***

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☑ ***CWC § 10608.24 (d)***

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

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

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

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

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

☑ ***CWC § 10608.40***

Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

Table 5-5 demonstrates the District's compliance with its individual 2020 GPCD target. As summarized in **Table 3-1** and **Table 4-2,** the District's 2020 population was 61,658 and its 2020 water use was 8,194 acre-feet (AF), which results in a daily gross per capita water use estimate of 119 GPCD. The District's 2020 actual GPCD is less than the target of 139 GPCD and the District is therefore in compliance with SB X7-7 requirements.

Table 5-5 SB X7-7 2020 Compliance – NMWD (DWR Table 5-2)

2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD *(Adjusted if applicable)*		
119	0	119	139	Yes
NOTES:				

The Alliance's 2020 water use was 76,804 AF and the 2020 population was 604,607, which results in a gross daily per capita water use estimate of 113 GPCD. The Alliance is not seeking adjustments to its 2020 target and, as summarized in **Table 5-6**, is in full compliance with its 2020 target GPCD.

Table 5-6 DWR Regional Alliance Compliance Submittal

2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD *(Adjusted if applicable)*		
113	0	113	129	Yes
NOTES:				

6. WATER SUPPLY CHARACTERIZATION

☑ ***CWC § 10631 (b)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

☑ ***CWC § 10631 (b) (2)***

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

This section describes existing and future sources of water available to North Marin Water District (NMWD or District). It includes a description of each water source, source limitations, water quality, and future opportunities for additional supply development. The District's water supplies presently come from a combination of imported water from Sonoma County Water Agency (SCWA or Sonoma Water), local surface water supplies, and recycled water. Each water supply is described further in the following sections.

6.1 Purchased Water

☑ ***CWC § 10631 (h)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

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

6.1.1 Sonoma County Water Agency Surface Water Supply

The District receives its primary water supply from SCWA's transmission system, which provides treated water purchased from SCWA's Russian River Project. The Russian River flows are augmented by Pacific Gas and Electric's (PG&E's) Potter Valley Project, which diverts a portion of the Eel River flows to the East Fork of the Russian River. Water is diverted and extracted from the stretch of the Russian River located just upstream of Wohler Bridge via six radial wells known as "Ranney collectors." The diverted river water percolates through sand and gravel and only needs the addition of chlorine to meet drinking water quality standards. Although the water extracted via Ranney collectors does percolate through the ground, due to the connection to the surface water source, this diversion is considered and is permitted as a surface water supply under existing surface water rights to the Russian River and Dry Creek water, described further in Section 6.1.2 (SCWA, 2016). As discussed further under Section 6.2, the SCWA supply also includes a relatively small amount of groundwater from groundwater supply wells located in the central Santa Rosa Plain subbasin (SCWA, 2016).

The District, along with other SCWA contractors, signed the Restructured Agreement for Water Supply (Agreement) in 2006. The Agreement provides for the financing, construction, and operation of diversion facilities, transmission lines, storage tanks, booster pumps, conventional wells, and appurtenant facilities. As described in Section 3.1 of this Agreement, SCWA:

> *…shall deliver to each Water Contractor* [i.e., each signatory to the Agreement] *at the points of delivery hereinafter set forth such quantities of water as the Water Contractor shall from time to time require at such rates of flow as are necessary to meet its peak day's demand, subject to the following:*
>
> *(a) SCWA shall not be obligated to deliver water in excess of the following:*

Water Contractor/ Aqueduct	*Average Daily Rate of Flow During Any Month*	*Annual Amount During Fiscal Year (Excluding Surplus Water)*
North Marin From Petaluma Aqueduct	*19.9 million gallons per day*	*14,100 acre-feet*

6.1.2 Sonoma County Water Agency Surface Water Rights

According to SCWA's 2015 UWMP (SCWA, 2016), four water rights permits (Permits 12947A, 12949, 12950, and 16596) issued by the State Water Resources Control Board (SWRCB) authorize SCWA to store up to 122,500 acre feet per year (AFY) of water in Lake Mendocino and up to 245,000 AFY of water in Lake Sonoma, and to divert or redivert up to 180 cubic feet per second (cfs) of water from the Russian River with a limit of 75,000 AFY. The permits also establish minimum instream flow requirements for fish and wildlife protection and recreation. These minimum instream flow requirements vary based on the hydrologic classifications of normal, dry, and critical water supply conditions as defined by SCWA's water rights permits and SWRCB Decision 1610, adopted in 1986 (SCWA, 2016). SCWA meets the various instream flow requirements by making releases from Coyote Valley Dam and Warm Springs Dam (SCWA, 2016). The Russian River Biological Opinion requires modification of minimum instream flow requirements on the Russian River and Dry Creek to maintain the Incidental Take Statement provided by the Biological Opinion (SCWA, 2016). SCWA's evaluation of future Russian River supply availability is based upon the assumption that that proposed changes to the minimum instream flow requirements under Decision 1610 set forth in the Biological Opinion are implemented, and that SCWA will obtain water rights approvals necessary to increase its total Russian River diversions above 75,000 AFY by 2035 (SCWA, 2016). The SCWA 2015 UWMP anticipates that SCWA would request at that time an additional 1,000 AFY to increase the overall supply from the Russian River to 76,000 AFY.

6.1.3 Sonoma County Water Agency Groundwater Supply

SCWA pumps a portion of its supply from the Santa Rosa Plain Subbasin of the Santa Rosa Valley Basin (DWR Basin # 1-55.01). Groundwater is used primarily as a drought period supply, or when Russian River supplies are otherwise constrained (SCWA, 2016). In 2015, groundwater made up less than 2% of SCWA's supplies; through 2045, groundwater is projected to make up 3% of SCWA's supplies in normal year

conditions (SCWA, 2016). It cannot be discerned what specific amount of SCWA supply provided to the District consists of groundwater; however, it is assumed to be proportionate to the overall percentage of groundwater used within SCWA's system. SCWA's groundwater supply is discussed further in Section 6.2.

6.2 Groundwater

☑ ***CWC § 10631***

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

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

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

The District does not pump groundwater and does not plan to use groundwater as a supply source in the future (see **Table 6-1**). For background purposes, information regarding the groundwater basin underlying the District's service area is provided below.

The groundwater basin underlying the District's service area is the Novato Valley Basin (California Department of Water Resources [DWR] Basin No. 2-30), which is categorized by the California Statewide Groundwater Elevation Monitoring (CASGEM) program as a very low priority basin (DWR, 2019). The basin occupies a structural depression in the eastern Coast Range west of San Pablo Bay. The basin drains to San Pablo Bay and the areas close to the bay are tidally influenced. The water-bearing deposits underlying the District are primarily the alluvial deposits of Pleistocene and Holocene age. These alluvium deposits overlie the non-water-bearing Franciscan Formation. The alluvium is composed of silt, clay, and sand with some lenses of gravel. Groundwater wells screened in sand and gravels yield approximately 50 gallons per minute (gpm). The groundwater quality within the District's service area boundary is considered poor due to high salinity, and potential well yields are low. Therefore, groundwater from the service area is not currently or planned to be used as a water supply source by the District.

Table 6-1 Groundwater Volume Pumped (DWR Table 6-1)

X	Supplier does not pump groundwater. The supplier will not complete the table below.					
	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
	TOTAL					
NOTES: (a) Volumes are in units of AF.						

Although the District does not pump groundwater directly, as noted in Section 6.1.3, a small portion of the SCWA water supply (i.e., less than 2%) is comprised of groundwater from the Santa Rosa Plain Subbasin of the Santa Rosa Valley Basin (DWR Basin 1-55.01). Given this, characteristics and groundwater management of the Santa Rosa Plain Subbasin are provided below.

6.2.1 Basin Description and Status

The Santa Rosa Subbasin is not adjudicated, and in its recent evaluation of California groundwater basins, DWR determined that the Basin is not in a condition of critical overdraft (DWR, 2019). The Santa Rosa Plain subbasin is currently categorized by the DWR program as a medium priority basin (DWR, 2019).

Under DWR's prioritization process, basins are ranked on eight components, and if a basin is assigned more than 14 total points, but less than 21 total points, it is defined as "medium priority." The main factors driving the Santa Rosa Plain subbasin's designation include population density (3 out of 5 possible ranking points), population growth (3 out of 5 possible points), public supply well density (5 out of 5 possible points), total production well density (5 out of 5 possible points), groundwater reliance (5 out of 5 possible points), and groundwater reliance (3 out of 5 possible points) (DWR, 2019).

Geologically, the Santa Rosa Plain subbasin has one main water-bearing unit, the Merced Formation, and several units with lower water-bearing capacities, including the Glen Ellen Formation and the Alluvium. The shallow Alluvium consists of poorly sorted coarse sand and gravel and moderately-sorted fine sand, silt, and clay. The alluvial deposits are not perennially saturated, have low permeability, and are generally unconfined or slightly confined (DWR, 2006). The Glen Ellen Formation underlies the Alluvium and consists of partially cemented beds of poorly sorted gravel, sand, and silt, and clay that vary widely in thickness and extent, with thicknesses varying from 3,000 feet to less than 1,500 feet on the west side of the valley (DWR, 2006). Underlying the Glen Ellen Formation is the Merced Formation, which is a marine deposit of fine sand and sandstone with thin interbeds of clay and silty-clay and some lenses of gravel and localized fossils. The Merced Formation is Pliocene in age and its thickness is estimated to range from 300 feet to greater than 1,500 feet. Aquifer continuity and water quality in the Merced Formation are generally very good, with well yields from 100 to 1,500 gpm (DWR, 2006).

As mentioned above, DWR has designated the Santa Rosa Plain subbasin as a medium priority basin and thus subject to the requirements of the Sustainable Groundwater Management Act (SGMA), including the

requirement to be covered by one or more Groundwater Sustainability Agencies (GSAs) and to prepare and submit to DWR one or more Groundwater Sustainability Plans (GSPs) by 31 January 2022. Actions related to management of the Santa Rosa Plain subbasin both currently and under SGMA are described in the next section.

6.2.2 Non-SGMA Groundwater Management

The Santa Rosa Plain subbasin is currently managed under the Santa Rosa Plain Watershed Groundwater Management Plan (GMP), developed by the Santa Rosa Plain Basin Advisory Panel (Santa Rosa Plain Basin Advisory Panel, 2014). The stated goal of the GMP is "to proactively coordinate public and private groundwater management efforts and leverage funding opportunities to maintain a sustainable, locally-managed, high-quality groundwater resource for current and future users, while sustaining natural groundwater and surface water functions." The GMP outlines eighteen Basin Management Objectives and groups these into seven key management components, including: (1) stakeholder involvement and public awareness, (2) monitoring and modeling program, (3) groundwater protection, (4) increasing water conservation and efficiency, (5) increasing groundwater discharge, (6) increasing water reuse, and (7) integrated groundwater management. The GMP is the groundwater management program for this area, until the SGMA GSP for the Santa Rosa Plain subbasin is adopted.

6.2.3 SGMA Groundwater Management

In 2014, the California State Legislature enacted the SGMA, with subsequent amendments in 2015. The SGMA requires the formation of GSAs and the development and implementation of GSPs for groundwater basins that are designated by DWR as medium or high priority. Because the Santa Rosa Plain subbasin is designated by DWR as a medium basin (DWR, 2019), the Santa Rosa Plain subbasin is subject to the requirements of SGMA, which include the formation of a one or more GSAs and the development and implementation of one or more GSPs.

The Santa Rosa Plain GSA was formed in June 2017 through a Joint Powers Agreement entered into by the SCWA, City of Cotati, City of Rohnert Park, City of Santa Rosa, City of Sebastopol, Town of Windsor, County of Sonoma, Gold Ridge Resource Conservation District, Sonoma Resource Conservation District, Branger Mutual Water Company, California American Water, Willowside Mutual Water Company, and Penngrove Water Company, and covers the entire subbasin. The Santa Rosa Plain GSA is governed by a nine-member Board of Directors, which includes a position held by SCWA. The Board of Directors is advised by an Advisory Committee that includes eighteen members appointed by the Board of Directors, representing various stakeholders. The GSP for the Santa Rosa Plain subbasin is currently under preparation and is anticipated to be complete and submitted to DWR by the statutory deadline of 31 January 2022. As of December 2020, initial drafts of sections describing the plan area and portions of the basin setting have been prepared and are available for public review on the Santa Rosa Plain GSA website: https://santarosaplaingroundwater.org/.

6.2.4 Coordination with Groundwater Sustainability Agencies

Because the District does not directly pump groundwater, it does not coordinate with any GSAs. However, as noted above, the SCWA is a member of Santa Rosa Plain GSA and NMWD has coordinated with SCWA on its demand projections through 2045.

6.2.5 Historical Pumping and Supply Sufficiency

As indicated in **Table 6-1**, the District does not pump any groundwater. SCWA's 2020 UWMP provides historical pumping and supply sufficiency information related to their use of groundwater and has factored this into the supply reliability information provided to the District and other Water Contractors.

6.3 Surface Water

The District supplements the water supply received from the SCWA with a local surface water supply from Stafford Lake. Stafford Lake, which captures runoff from an area of 8.3 square miles, is located four miles west of downtown Novato. Runoff contributing flow to the lake is provided from land near the upper reaches of Novato Creek. The capacity of Lake Stafford is 4,450 acre-feet (AF).

The District holds two water rights on Novato Creek with the SWRCB: (1) License 9831 issued in 1970, and (2) Water Right Permit 18800 issued in 1983. License 9831 allows the District to directly divert up to 2.9 cfs and to divert 4,000 AF to storage in Stafford Lake between October 1 and April 30. The total amount of direct diversion and diversion to storage authorized during a water year (between October 1 and September 30 of the subsequent year) under License 9831 is 4,490 AF.

Water Right Permit 18800 allows the District to directly divert up to 9.75 cfs from Novato Creek between October 1 and April 30 and to divert up to 4,400 AF to storage between November 1 and April 1. Although Water Right Permit 18800 limits the total storage between both Water Right Permit 18800 and License 9831 to 4,400 AF, it allows for a maximum of 8,454 AF to be diverted from the Novato Creek during any water year.

6.4 Stormwater

There are no plans to divert stormwater for beneficial uses in the District. Although stormwater detection has been studied by the County Flood Control District for flood reduction purposes, no viable storage locations were identified within the Novato watershed as part of that study.

6.5 Wastewater and Recycled Water

☑ ***CWC § 10633***

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

This section provides information on the amount of generated wastewater and existing disposal of wastewater to determine the potential for recycled water use by the District. The amount of recycled water currently used, potentially available, and future potential uses for recycled water for the District are also described.

6.5.1 Recycled Water Coordination

The District worked in coordination with the Novato Sanitary District (NSD) to update the Recycled Water Master Plan and evaluate the economic feasibility of implementing a recycled water system to serve landscape irrigation users in the Novato area. In 2007, the Deer Island Water Recycling Plant (Deer Island WRP) was completed and delivery of recycled water to Stonetree Golf Course began. In 2009, the recycled water system was extended to Novato Fire Protection District Station 62.

Since 2005, the District has been working as a member of the North Bay Water Reuse Authority (NBWRA) to expand use of recycled water on a regional basis in the North San Pablo Bay region. As a result, the District worked with NSD to expand the treatment and delivery of recycled water from the Davidson Street Recycled Water Facility (also known as the Davidson Street Treatment Plant or Novato Treatment Plant) to the north and central portions of its service area in 2012 and 2018. In 2013 the District coordinated with the Las Gallinas Valley Sanitary District (LGVSD) to expand the treatment and delivery of recycled water in the southern area of Novato, principally the Hamilton Field area.

6.5.2 Wastewater Collection, Treatment, and Disposal

☑ ***CWC § 10633 (a)***

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

☑ ***CWC § 10633 (b)***

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

Within the District's service area, wastewater is collected and treated by NSD. A small number of residential dwellings within the District's service area utilize on-site septic treatment systems and are not connected to NSD's sewer collection system. **Table 6-2** identifies the volume collected within the District's service area by NSD.

Table 6-2 Wastewater Collected Within Area in 2020 (DWR Table 6-2)

	There is no wastewater collection system. The supplier will not complete the table below.
	Percentage of 2020 service area covered by wastewater collection system *(optional)*
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*

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	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
Novato Sanitary District	Metered	4,750	Novato Sanitary District	Davidson St.	Yes	Yes
Novato Sanitary District	Metered	20	Novato Sanitary District	Deer Island Water Recycling Plant	Yes	Yes
Total Wastewater Collected from Service Area in 2020:		4,769				

NOTES:
(a) Volumes are in units of AF.

Table 6-3 identifies the volume of treated wastewater either recycled or disposed of within the District's service area. NSD owns the Davidson Street Recycled Water Facility, which serves all Novato and provides advanced wastewater treatment at both the secondary and tertiary treatment level. Operation of the facility is contracted to a private third party, Veolia Water. During winter months, secondary treated water flows to San Pablo Bay via an outfall pipe. The San Francisco Bay Regional Water Quality Control Board (RWQCB) regulates discharges to the San Pablo Bay from the Novato Treatment Plant. During the summer months, secondary treated water is recycled and used to irrigate pastures and the Deer Island wildlife pond adjacent to Highway 37. Disinfected tertiary treated water from NSD's Novato Treatment Plant provides recycled water at standards meeting Title 22 requirements for the District's North and Central Service Areas. The District also owns and operates the Deer Island Water Recycling Plant (Deer Island WRP), which discharges to the Stonetree Golf Course and also serves as standby facility should operational problems develop at the NSD Novato Treatment Plant. The Deer Island WRP has very low production volumes compared to the Davidson Street Recycled Water Facility, as shown in **Table 6-3**.

LGVSD owns and operates the LGVSD Treatment Plant and has a service area just south of the District's Novato service area. Although LGVSD's wastewater is generated from outside of the District's service area, LGVSD supplies the District with disinfected tertiary recycled water in conformance with Title 22 requirements to serve the District's South Service Area in the quantities shown in **Table 6-3**.

Table 6-3 Wastewater Treatment and Discharge Within Service Area in 2020 (DWR Table 6-3)

	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
NSD, Davidson St	San Pablo Bay			Bay or estuary outfall	No	Secondary, Disinfected - 23	3,225	3,225	0	0	0
NSD	Reclamation Storage Ponds	Pasture irrigation		Other	No	Secondary, Disinfected - 23	909	0	909	0	0
NSD	Property Fenceline	Recycled water flow to NMWD		Other	No	Tertiary	555	0	555	0	0
NSD, Deer Island Water Recycling Plant	Stone Tree Golf Course	Golf course irrigation		Other	No	Tertiary	20	0	20	0	0
NSD	Bel Marin Keys Unit V Phase 1 Wetlands Project			Other	No	Secondary, Disinfected - 23	61	0	61	0	0
LGVSD	Property Fenceline	Recycled water flow to NMWD (a)		Other	Yes	Tertiary	144	0	144	0	0

	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
						Total	4,913	3,225	1,688	0	0

NOTES:
(a) The actual wastewater treated by this plant were assumed to equal to the sum of the discharged and recycled water.
(b) Volumes are in units of AF.

6.5.3 Recycled Water System and Potential, Current, and Projected Uses of Recycled Water

☑ ***CWC § 10633 (c)***

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

☑ ***CWC § 10633 (d)***

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

☑ ***CWC § 10633 (e)***

The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.

The 2006 *Recycled Water Implementation Plan* (Nute Engineering, 2006) was prepared to provide guidance and phasing for the recycled water system. Based on the 2006 Implementation Plan recommendations, the District entered into agreements with both NSD and LGVSD. Under the terms of both agreements, the NSD and LGVSD are the producers and NMWD is the distributer of recycled water. The Recycled Water Implementation Plan divided the Novato Service Area into North, Central, and South service areas.

In accordance with the recommendations in the Recycled Water Implementation Plan, the following recycled water uses have been developed in the three service areas:

- North Service Area: Recycled water is conveyed from the Deer Island WRP to the Stonetree Golf Course and the Novato Fire Department. In addition, an interconnection between the Deer Island WRP and the Davidson Street Recycled Water Facility was constructed to improve the reliability of recycled water supplies.
- South Service Area: Recycled water is conveyed from the LGVSD Recycled Water Facility to landscape irrigation customers located in the South Service Area.
- Central Service Area: Recycled water is conveyed from the Davidson Street Treatment Plant to private and public landscape irrigation customers, including homeowner associations, Marin Country Club, and Vintage Oaks Shopping Center.

Table 6-4 below provides the existing and anticipated future recycled water uses within the District. All of the currently anticipated recycled water use is for landscape and golf course irrigation, although the District is evaluating expanding recycled water use for commercial applications. Due to infrastructure upgrades at the Las Gallinas Valley Water Recycling Facility (Las Gallinas Valley WRF), all demands that would normally have been met by Las Gallinas Valley WRF were instead met by potable water in 2020. The volume of potable water makeup used to supplement the recycled water system from 2016 through 2020 is provided in Section 4.1, and the 60 AF of potable water makeup used in 2020 is included within the recycled water volumes shown in **Table 6-4**. Potable water is not anticipated to be needed to supplement the recycled water system going forward, following plant upgrades. Startup testing for the

upgrades at the Las Gallinas WRF began in early March 2021, and the plant expected to be fully operational by April 2021.

Table 6-4 Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)

	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.
Name of Supplier Producing (Treating) the Recycled Water:	Novato Sanitary District and Las Gallinas Valley Sanitary District
Name of Supplier Operating the Recycled Water Distribution System:	North Marin Water District
Supplemental Water Added in 2020 (volume)	60 AFY
Source of 2020 Supplemental Water	North Marin Water District Potable Water Supply

Beneficial Use Type	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity)	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Landscape irrigation (excludes golf courses)	Irrigation		NMWD North and South Service Areas (now), Central Service Area (future)	Tertiary	332	366	374	383	391	400
Golf course irrigation	Irrigation		StoneTree Golf Course (now), MCC (future)	Tertiary	326	229	234	239	245	250
				Total:	658	595	608	622	636	650
				2020 Internal Reuse						

NOTES:
(a) Volumes are in units of AF.
(b) Proportion of use for the North and South service area is estimated at 50.5% of total use, while use for StoneTree Golf Course is estimated at 49.5%.

6.5.4 Comparison of Previously Projected Use and Actual Use

☑ *CWC § 10633 (e)*

A description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

Table 6-5 compares the District's 2015 UWMP projection for 2020 recycled water demand to actual 2020 recycled water use.

The District's 2015 UWMP projected recycled water demand to be 650 AF in 2020. Actual water use by the recycled water system in 2020 was 658 AF[15], which is very similar to the projected demand from 2015.

Table 6-5 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5)

	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below.	
Beneficial Use Type	2015 Projection for 2020	2020 Actual Use
Landscape irrigation (excludes golf courses)	400	332
Golf course irrigation	250	326
Total	650	658

NOTES:
(a) Volumes are in units of AF.
(b) During 2020, the Las Gallinas WRF was offline due to infrastructure upgrades and all demands that would normally be met by the recycled water system were met by potable water. This table reflects the use of water by the recycled water system and not specifically the use of recycled water.

[15] During 2020, the Las Gallinas WRF was offline due to infrastructure upgrades and all recycled water demands that would normally have been met by the Las Gallinas WRF were instead met by potable water. Potable water is not anticipated to be needed to supplement the recycled water system going forward, following plant upgrades that were completed in April 2021. The use of supplemental potable water is included in the reported 2020 actual recycled water use.

6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

☑ ***CWC § 10633 (e-g)***

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

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

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

As described in **Table 6-6**, the District encourages the future expanded use of recycled water through District Regulation No. 18. District Regulation 18 includes a mandatory use requirement for recycled water service when connection to the recycled water system is deemed to be feasible. District Regulation No. 18 applies to both existing customers and new development within the District's recycled water service areas. Retrofit costs for existing customers are paid by the District to help encourage the development of recycled water users in a fair and equitable manner.

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

	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
66	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Conditional Service	New and existing customers are required to use recycled water where available.	Ongoing	Unknown
		Total	
NOTES: (a) Volumes are in units of AF.			

6.6 Desalinated Water

☑ ***CWC § 10631 (g)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

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

Although the District has not investigated the feasibility of constructing a desalination plant, the neighboring Marin Municipal Water District (MMWD) previously performed a study exploring desalination as a potential supply option. If a full-scale desalination plant were constructed, it is possible that the District could supplement its water supply with desalinated water under a future agreement with MMWD. However, because MMWD currently does not intend to pursue desalination further, it is not included in this Plan as a future water supply source.

6.7 Water Exchanges and Transfers

☑ ***CWC § 10631 (c)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

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

Currently, when surplus transmission system capacity is available, MMWD receives Russian River water from SCWA through the District's North Marin Aqueduct under the MMWD Supplemental Water Supply Agreement with SCWA. A provision of the Intertie Agreement between the District and MMWD allows for delivery of MMWD's Russian River water through the District's aqueduct, referred to as "wheeling". Because MMWD has a direct agreement with SCWA, Russian River water delivered to MMWD does not affect the District's allocation.

Although the District does not currently transfer or exchange water with other entities, water transfers between SCWA's water contractors are authorized under the Restructured Agreement. Such transfers and exchanges between SCWA water contractors have been necessary in the past and may be necessary in the future to improve water supply reliability.

6.8 Future Water Projects

☑ ***CWC § 10631*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

(b) (3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

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

This section provides a description of the District's anticipated future water supply projects. Future projects that may contribute to the District's water supply are summarized in **Table 6-7**. As listed below, SCWA expects to file an application with the SWRCB by around 2030 to increase its annual diversion and rediversion limit on the Russian River.

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

	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
68	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Y/N	*If Yes, Supplier Name*				
Modification/ Acquisition of Additional Water Rights	Yes	Sonoma County Water Agency	Agency estimates that existing rights will be exceeded by 2035	2030	All Year Types	5,000
NOTES: (a) Volumes are in units of AF.						

6.9 Summary of Existing and Planned Sources of Water

☑ ***CWC § 10631 (b)*** *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

☑ ***CWC § 10631 (b) (4) (D)*** *A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

The District purchases potable water from SCWA to meet most of the water demands within the District's service area. In 2020, the District purchased approximately 5,900 AF of water from SCWA. The remainder of the District's water supply comes from local surface water and recycled water. The District's water supplies in 2020 are summarized in **Table 6-8**.

The District plans to continue to purchase wholesale water from SCWA, while monitoring its surface water supplies from Stafford Lake. Water supplies from the SCWA through 2045 are projected to be equivalent to the District's annual entitlement of 14,100 AFY, established in the Restructured Agreement and effective through 2037. Surface water projections from Stafford Lake are based on averages of historical flows, which typically range between 0 and 2,000 AFY. The District's total water supply projections are shown in **Table 6-9** in five-year increments through 2045.

Table 6-8 Water Supplies - Actual (DWR Table 6-8)

Water Supply	Additional Detail on Water Supply	Actual Volume 2020	Water Quality	Total Right or Safe Yield *(optional)*
Purchased or Imported Water	From SCWA	5,887	Drinking Water	
Surface water (not desalinated)	From STP	2,105	Drinking Water	
Surface water (not desalinated)	Sold to IV Golf Course & MC Parks	202	Other Non-Potable Water	
Recycled Water	North, Central, and South Service Areas	658	Recycled Water	
	Total	8,852		
NOTES: (a) Volumes are in units of AF.				

Table 6-9 Water Supplies - Projected (DWR Table 6-9)

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Purchased or Imported Water	Sonoma County Water Agency (b)	14,100		14,100		14,100		14,100		14,100	
Surface water (not desalinated)	Stafford Lake (c)	1,000		1,000		1,000		1,000		1,000	
Recycled Water		595		608		622		636		650	
Other	Raw Water	218		218		218		218		218	
Total		15,913		15,826		15,940		15,954		15,968	

NOTES:
(a) Volumes are in units of AF.
(b) SCWA supplies are equivalent to the District's annual entitlement as established in the Restructured Agreement.
(c) Surface supplies are based on an average of historical flows, which typically range from 0 to 2,000 AFY.

6.10 Special Conditions

6.10.1 Climate Change Effects

As discussed in SCWA's Draft 2020 Urban Water Management Plan (SCWA, 2021), SCWA has been evaluating the effects of climate change. As stated by SCWA:

> *Sonoma Water has investigated whether existing downscaled climate models can be used or modified to provide reliable estimates of the effects of increased concentrations of carbon dioxide and other greenhouse gases on temperatures and precipitation patterns within Sonoma Water's service area and within the watersheds from which Sonoma Water obtains its water supply during the 25-year planning horizon. As of this time, no detailed analysis exists of potential climate change impacts that takes into consideration the influence of marine layers, whose effects on the region are difficult to model. Given the uncertainties between various downscaled models, Sonoma Water evaluates ensembles of downscaled models for general water supply planning purposes. However, there is not one model that can be selected with any confidence to be analyzed for the required format of this Plan. For these reasons, this Plan assumes that the climatic patterns and associated hydrology experienced over the past 108 years of record (1910 – 2017) provide a reasonable basis for the 25-year planning horizon that would impact the water supply and water demand analysis set forth in the Plan.*
>
> *As discussed in Section 5.9, however, the United States Geological Survey (USGS) conducted a study for Sonoma Water on the potential effects of climate change on Sonoma Water's water supply, which has provided additional information on the potential impacts of climate change on Sonoma Water's service area. Furthermore, Sonoma Water has embarked on development of a Climate Adaptation Plan which studies the potential impacts of climate change in regards to both water supply reliability and Sonoma Water's transmission system facilities. This planning process analyzes the results of multiple climate models to determine a range of potential climate related impacts. A risk based analysis of the potential impacts to the watershed and Sonoma Water facilities will be used to identify courses of action that can be pursued to mitigate the effects of climate change. The work plan was developed in 2015 and a robust planning process began in 2016. Sonoma Water expects to bring the Climate Adaptation Plan to its Board for approval in summer 2021.*

6.10.2 Regulatory Conditions and Project Development

Emerging regulatory conditions may affect planned future projects and the characterization of future water supply availability and analysis. The District does not have any current plans to develop additional supply sources. If the District does move forward with any plans to develop supply projects, emerging

regulatory conditions will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

6.10.3 Other Locally Applicable Criteria

Other locally applicable criteria may affect characterization and availability of an identified water supply (e.g., changes in regional water transfer rules may alter the availability of a water supply that had historically been readily available). The District does not have any current plans to develop additional supply sources. If the District does move forward ahead with any plans to develop supply projects, locally applicable criteria will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

6.11 Energy Intensity

☑ ***CWC § 10631.2***

(a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:
(1) An estimate of the amount of energy used to extract or divert water supplies.
(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
(3) An estimate of the amount of energy used to treat water supplies.
(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
(6) An estimate of the amount of energy used to place water into or withdraw from storage.
(7) Any other energy-related information the urban water supplier deems appropriate.
(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.
(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

Within the service area, the District uses energy to treat and distribute water supplies through its distribution systems, including at the Stafford Treatment Plant and the distribution system pump stations, and other facilities.[16] The energy used by the distribution systems is metered and documented in monthly PG&E bills. During Fiscal Year (FY) 2020, the District used 2,790,972 kilowatt hours (kWh) of energy to operate the water supply system and deliver 8,194 AFY of potable and non-potable water to customers in the service area, for a total energy intensity of 341 kWh/AF (**Table 6-10**). SCWA also uses energy to treat and distribute water before delivery to the District. However, the energy is used outside of the District's service area, and the energy consumption information is not typically shared with the District.

[16] Other facilities include West Marin Facilities.

The District also generates renewable energy through the Stafford Treatment Plant, which has solar energy cells that produce energy for the District. In FY 2020, the total energy produced was 678,275 kWh.

Table 6-10 Recommended Energy Intensity - Total Utility Approach (DWR Table O-1B)

Urban Water Supplier: *North Marin Water District*

Water Delivery Product

Multiple Products (unable to use table O-1C)

Enter Start Date for Reporting Period	7/1/2019	Urban Water Supplier Operational Control		
End Date	6/29/2020			
Is upstream embedded in the values reported?		Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	AF	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		*8,194*	*0*	*8,194*
Energy Consumed (kWh)		*2,790,972*	*0*	*2,790,972*
Energy Intensity (kWh/volume)		*341*	*0.0*	*341*

Quantity of Self-Generated Renewable Energy

678,275 kWh

Data Quality

Metered Data

Data Quality Narrative:

Utility bills for the associated time period are used as the source for energy consumption data.

Narrative:

Total energy consumption represents the energy consumed during pumping, treatment, conveyance, and distribution. Renewable energy is generated from solar cells at the Stafford Treatment Plant.

7. WATER SUPPLY RELIABILITY

☑ ***CWC § 10620 (f)***

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

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This chapter describes the reliability of the North Marin Water District's (NMWD's or District's) water supplies. Assessment of water supply reliability is complex and dependent upon a number of factors, such as the number of water sources, regulatory and legal constraints, hydrological and environmental conditions, climate change, and expected growth, among others. Based on available historical information and projections of future water uses, regulatory and legal constraints, and hydrological and environmental conditions, including climate change, the District has made its best determination of future water supply reliability of for the District, as described below.

7.1 Constraints on Water Sources

Purchased water from Sonoma County Water Agency (SCWA or Sonoma Water) and local surface water are the primary supply sources for the District. Potential constraints on future purchased water availability have been identified, including water quality and climate change. These constraints, along with associated management strategies, are summarized in the following sections.

7.1.1 Supply Availability

Purchased Water

The water available to SCWA's customers is constrained by both physical and legal constraints. The capacity of SCWA's transmission system is a physical constraint that can limit the District's water supply from SCWA. The District receives the SCWA supply through the District's North Marin Aqueduct, which is a 30, 36, and 42-inch diameter steel transmission main that runs from SCWA's Petaluma Aqueduct near Kastania Tank in south Petaluma to a connection located at the northern end of the District's pipeline facilities in Novato.

Legal constraints include the Restructured Agreement for Water Supply (Agreement), SCWA Water Rights, and the Russian River Biological Opinion. These legal constraints are described below.

- The Agreement includes specific maximum amounts of water that SCWA is obligated to supply to its Water Contractors, including the District. The Agreement states that SCWA is not obligated to

provide the District with more than 14,100 acre feet per year (AFY) or more than 19.9 million gallons per day (MGD) as an average flow during any single month.

- Four State Water Resources Control Board (SWRCB) permits (SWRCB Permit Numbers 12947A, 12949, 12950, and 1596) currently authorize SCWA to store water in Lake Mendocino (122,500 AFY) on the East Fork Russian River and Lake Sonoma (245,000 AFY) on Dry Creek, and to divert and redivert 180 cubic feet per second (cfs) of water from the Russian River, up to 75,000 AFY. SCWA estimates the existing annual diversion and rediversion limit of 75,000 AFY will be exceeded by 2035 (NMWD, 2016). Consequently, SCWA will need to file an application to SWRCB by around 2030 to increase its annual diversion and rediversion limit (NMWD, 2016). The permits also establish minimum instream flow requirements for fish and wildlife protection as well as for recreational considerations. These minimum instream flow requirements vary according to the hydrologic cycle as defined by SWRCB Decision 1610. SCWA meets the Decision 1610 flow requirements by making releases from Coyote Valley Dam at Lake Mendocino and Warm Springs Dam at Lake Sonoma (NMWD, 2016).
- On 24 September 2008, the National Marine Fisheries Service (NMFS) issued a 15-year biological opinion for water supply, flood control operations, and channel maintenance conducted by the U.S. Army Corps of Engineers (USACE), SCWA, and Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River watershed. The Russian River Biological Opinion (Biological Opinion) concluded that the elevated river flows required by Decision 1610 were adversely affecting fish habitat and listed alternatives to reduce the effects. The alternatives included:
    - Reducing summertime flows in the Russian River and Dry Creek;
    - Enhancing six miles of habitat in Dry Creek;
    - Creating a freshwater lagoon in the estuary during summer months;
    - Monitoring both habitat and fish in the Dry Creek, the estuary, and the Russian River; and
    - Eliminating impediments to fish spawning or improving habitat in several streams.
- The Biological Opinion requires that summertime flows be permanently reduced to replicate river conditions in dry years. Since the biological opinion was released, SCWA has submitted a petition to the SWRCB requesting permanent changes to Decision 1610 minimum flow requirements in line with the Biological Opinion and is preparing an Environmental Impact Report (EIR) required by the California Environmental Quality Act (CEQA). Since 2010, SCWA has requested temporary changes to the Decision 1610 minimum flows annually based on the Biological Opinion recommendations.

In addition to these projects, SCWA is currently evaluating the feasibility of groundwater banking as a method of increasing water supply reliability. A Groundwater Banking Feasibility Study was completed in 2012. SCWA worked with the City of Sonoma to implement a pilot study using one of the City of Sonoma's municipal supply wells (SCWA, 2016).

Surface Water

The surface water available from Stafford Lake is constrained by the legal constraints of its two water rights with the State Water Resources Control Board (SWRCB), which include License 9831 and Water Right Permit 18800, which allow for a maximum of 8,454 AF to be diverted from Novato Creek during any water year. Constraints of the water rights include:

- License 9831 allows the District to directly divert up to 2.9 cfs and to divert 4,000 AF to storage in Stafford Lake between October 1 and April 30. The total amount of direct diversion and diversion to storage authorized during a water year (between October 1 and September 30 of the subsequent year) under License 9831 is 4,490 AF.
- Water Right Permit 18800 allows the District to directly divert up to 9.75 cfs from Novato Creek between October 1 and April 30 and to divert up to 4,400 AF to storage between November 1 and April 1. Although Water Right Permit 18800 limits the total storage between both Water Right Permit 18800 and License 9831 to 4,400 AF, it allows for a maximum of 8,454 AF to be diverted from the Novato Creek during any water year.

The primary physical constraint to the local surface water supply is the 6.0 million gallon per day (MGD) capacity of the Stafford Treatment Plant (STP). As noted in Section 7.2, Stafford Lake can be fed in dry year periods by pumping the SCWA supply through the San Marin Pump Station.

7.1.2 Water Quality Impacts on Reliability

☑ ***CWC § 10634***

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Impaired water quality has the potential to affect water supply reliability. The District has and will continue to meet all state and federal water quality regulations. All drinking water standards are set by the U.S. Environmental Protection Agency (USEPA) under the authorization of the Federal Safe Drinking Water Act of 1974. In California, the State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW) can either adopt the USEPA standards or set more stringent standards, which are then codified in Title 22 of the California Code of Regulations. There are two general types of drinking water standards:

- **Primary Maximum Contaminant Levels (MCLs)** are health protective standards and are established using a very conservative risk-based approach for each constituent that takes into potential health effects, detectability and treatability, and costs of treatment. Public water systems may not serve water that exceeds Primary MCLs for any constituent.
- **Secondary MCLs** are based on the aesthetic qualities of the water such as taste, odor, color, and certain mineral content, and are considered limits for constituents that may affect consumer acceptance of the water.

The District routinely monitors the water that is treated and served to customers to ensure that water delivered to customers meets these drinking water standards. The results of this testing are reported to the SWRCB DDW following each test and are summarized annually in Water Quality Reports (also known as "Consumer Confidence Reports"), which are provided to customers by mail and made available on the District's website at https://nmwd.com/your-water/water-quality/.

Given the District's proactive monitoring and management of water quality in its source water supplies, water quality is not expected to impact the reliability of the District's available supplies within the planning horizon (i.e., through 2045).

7.1.3 Climate Change Impacts to Supply

☑ ***CWC § 10635(b)***

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

Section 4.4 of this Urban Water Management Plan (UWMP or Plan) presents information on how the impacts of climate change are considered in projected demands in the District, and Section 6.10.1 provides a summary of potential climate change impacts on supplies.

As discussed in Section 6.10.1, SCWA is developing the Climate Adaptation Plan to study the impact of climate change on water supply reliability and SCWA's transmission system facilities. The District will review the Climate Adaptation Plan when it is released and incorporate it in the next UWMP.

7.2 Reliability by Type of Year

☑ ***CWC § 10631 (b)***

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

☑ ***CWC § 10631 (b)(1)***

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

☑ ***CWC § 10635 (a)***

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

Per the UWMP Guidebook 2020, the water service reliability assessment includes three unique year types:

- A normal hydrologic year represents the water supplies available under normal conditions, this could be an averaged range of years or a single representative year,
- A single dry year represents the lowest available water supply, and
- A five-consecutive year drought represents the driest five-year period in the historical record.

Identification of these dry year periods consistent with the UWMP Guidebook 2020 methodology is provided below.

As shown in **Table 7-1**, quantification of the available supplies is not compatible with the standard DWR Table 7-1, and therefore the available supplies are summarized in **Table 7-2** through **Table 7-5** in Sections 7.2.1 through 7.2.4.

Table 7-1 Basis of Water Year Data (Reliability Assessment) (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats		
		X	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: **Table 7-2, 7-3, 7-4, and 7-5**	
			Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available		% of Average Supply
Average Year				100%
Single-Dry Year				
Consecutive Dry Years 1st Year				
Consecutive Dry Years 2nd Year				
Consecutive Dry Years 3rd Year				
Consecutive Dry Years 4th Year				
Consecutive Dry Years 5th Year				
NOTES: (a) Volumes are in units of AF.				

7.2.1 Purchased Water

The projected availability of purchased water supplies by year type are provided in **Table 7-2** below. It is assumed that the District will purchase its full available contract amount in normal years. Dry year projections reflect the reduced reliability estimates provided by SCWA.

Table 7-2 Projected Availability of SCWA Supply (Responds to DWR Table 7-1)

Year Type		2025	2030	2035	2040	2045
Normal Year		14,100	14,100	14,100	14,100	14,100
Single-Dry Year		14,100	11,858	11,745	11,618	11,477
Extended Drought	First year	14,100	14,100	14,100	14,100	14,100
	Second year	14,100	14,100	14,100	14,100	14,100
	Third year	14,100	14,100	14,100	14,100	14,100
	Fourth year	14,100	14,100	14,100	14,100	14,100
	Fifth year	14,100	14,100	14,100	14,100	14,100

NOTES:
(a) Volumes are in units of AF.
(b) Dry year supplies from SCWA were estimated based on the total supply shortfall in dry years.

7.2.2 Surface Water

The water supply from Stafford Lake is unaffected by dry conditions and is projected to be the same during single and multiple dry years as during normal years. Stafford Lake can be operated to avoid drought conditions in dry year periods by "backfeeding" the lake during winter months with SCWA supply. The backfeeding is accomplished by pumping the SCWA supply through the San Marin Pump Station via the transmission main from Stafford Treatment Plant (STP), bypassing the treatment plant and discharging into Stafford Lake. This backfeeding is enabled by the Interconnection Agreement and is performed periodically, most recently in 2018. The projected availability of local surface water supplies by type are provided in **Table 7-3** below.

Table 7-3 Projected Availability of Local Surface Water Supply (Responds to DWR Table 7-1)

Year Type		2025	2030	2035	2040	2045
Normal Year		1,000	1,000	1,000	1,000	1,000
Single-Dry Year		1,000	1,000	1,000	1,000	1,000
Extended Drought	First year	1,000	1,000	1,000	1,000	1,000
	Second year	1,000	1,000	1,000	1,000	1,000
	Third year	1,000	1,000	1,000	1,000	1,000
	Fourth year	1,000	1,000	1,000	1,000	1,000
	Fifth year	1,000	1,000	1,000	1,000	1,000

NOTES:
(a) Volumes are in units of AF.

7.2.3 Raw Water

Supply availability for raw water is not expected to be impacted in dry years, as reflected in **Table 7-4** below, and is consistent with the demand projections identified in **Table 4-4**.

Table 7-4 Projected Availability of Raw Water Supply (Responds to DWR Table 7-1)

Year Type		2025	2030	2035	2040	2045
Normal Year		218	218	218	218	218
Single-Dry Year		218	218	218	218	218
Extended Drought	First year	218	218	218	218	218
	Second year	218	218	218	218	218
	Third year	218	218	218	218	218
	Fourth year	218	218	218	218	218
	Fifth year	218	218	218	218	218
NOTES: (a) Volumes are in units of AF.						

7.2.4 Recycled Water

Supply availability for recycled water is not expected to be impacted in dry years, as reflected in **Table 7-5** below, and is consistent with the demand projections identified in **Table 6-4**.

Table 7-5 Projected Availability of Recycled Water Supply (Responds to DWR Table 7-1)

Year Type		2025	2030	2035	2040	2045
Normal Year		595	608	622	636	650
Single-Dry Year		595	608	622	636	650
Extended Drought	First year	595	608	622	636	650
	Second year	595	608	622	636	650
	Third year	595	608	622	636	650
	Fourth year	595	608	622	636	650
	Fifth year	595	608	622	636	650
NOTES: (a) Volumes are in units of AF.						

7.3 Supply and Demand Assessment

☑ *CWC § 10635 (a)*

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

Water supply and demand patterns change during normal, single dry, and multiple dry years. **Table 7-6** shows the projected supply and demand totals for a normal year. The supply and demand totals are consistent with those in **Table 6-9** and **Table 4-3**, respectively. **Table 7-7** shows the projected supply and demand totals for the single dry year, and **Table 7-8** shows the projected supply and demand totals for multiple dry year periods extending five years.

Table 7-6 Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045
Supply totals *From DWR Table 6-9*	15,913	15,926	15,940	15,954	15,968
Demand totals *From DWR Table 4-3*	10,679	10,857	11,085	11,108	11,152
Difference	5,234	5,069	4,855	4,846	4,816
NOTES: (a) Volumes are in units of AF.					

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

	2025	2030	2035	2040	2045
Supply totals	15,913	13,684	13,585	13,472	13,345
Demand totals	10,679	10,857	11,085	11,108	11,152
Difference	5,234	2,827	2,500	2,364	2,194
NOTES: (a) Volumes are in units of AF.					

Table 7-8 Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045
First year	Supply totals	15,913	15,926	15,940	15,954	15,968
	Demand totals	10,679	10,857	11,085	11,108	11,152
	Difference	5,234	5,069	4,855	4,846	4,816
Second year	Supply totals	15,913	15,926	15,940	15,954	15,968
	Demand totals	10,679	10,857	11,085	11,108	11,152
	Difference	5,234	5,069	4,855	4,846	4,816
Third year	Supply totals	15,913	15,926	15,940	15,954	15,968
	Demand totals	10,679	10,857	11,085	11,108	11,152
	Difference	5,234	5,069	4,855	4,846	4,816
Fourth year	Supply totals	15,913	15,926	15,940	15,954	15,968
	Demand totals	10,679	10,857	11,085	11,108	11,152
	Difference	5,234	5,069	4,855	4,846	4,816
Fifth year	Supply totals	15,913	15,926	15,940	15,954	15,968
	Demand totals	10,679	10,857	11,085	11,108	11,152
	Difference	5,234	5,069	4,855	4,846	4,816

NOTES:
(a) Volumes are in units of AF.

7.4 Water Management Tools and Options

The District is a member of the North Bay Water Reuse Authority (NMWRA), which is a regional water recycling organization formed to put recycled water to its broadest and most beneficial use. NBWRA consists of ten local agencies covering 315 square-miles in the portions of Marin, Sonoma and Napa counties that surround the northern rim of the San Francisco Bay. As part of NBWRA, the District has made great strides to expand recycled water use.

The District is also a member of the Sonoma-Marin Saving Water Partnership (SMSWP), which is a regional partnership program that represents twelve utilities in Sonoma and Marin counties that have joined together to provide a regional approach to water use efficiency. Participating in the partnership, the District has continued to implement an extensive water conservation program which reduces the demand on imported supplies. As described in Chapter 9, the District manages per capita water use through the implementation of a series of DMMs.

7.5 Drought Risk Assessment

☑ ***CWC § 10635(b)***

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

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

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

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

7.5.1 Characteristic Five-Year Water Use

As a first step to the Drought Risk Assessment, water suppliers are advised to estimated unconstrained water demand for the next five years (2021-2025). Unconstrained water demand is the expected water use in the absence of drought water use restrictions. The forecast for the next five-years is shown in **Table 7-9** below.

Table 7-9 Characteristic Five-Year Water Use

	2021	2022	2023	2024	2025
Total Projected Use During Drought Period	9,318	9,641	9,975	10,321	10,679

7.5.2 Risk Assessment Projections

SCWA is expecting to be able to provide sufficient water supply from 2021 to 2025 to its water service contractor, including the District. Thus, as shown in **Table 7-10**, the District is expected to have sufficient water supply in the next five years.

Table 7-10 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)

2021	Total
Total Water Use	9,318
Total Supplies	15,913
Surplus/Shortfall w/o WSCP Action	6,595
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	-
WSCP - use reduction savings benefit	-
Revised Surplus/(shortfall)	-
Resulting % Use Reduction from WSCP action	0%

2022	Total
Total Water Use	9,641
Total Supplies	15,913
Surplus/Shortfall w/o WSCP Action	6,272
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	-
WSCP - use reduction savings benefit	-
Revised Surplus/(shortfall)	-
Resulting % Use Reduction from WSCP action	0%

2023	Total
Total Water Use	9,975
Total Supplies	15,913
Surplus/Shortfall w/o WSCP Action	5,938
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	-
WSCP - use reduction savings benefit	-
Revised Surplus/(shortfall)	-
Resulting % Use Reduction from WSCP action	0%

Table 7-10 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)

2024	Total
Total Water Use	10,321
Total Supplies	15,913
Surplus/Shortfall w/o WSCP Action	5,592
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	-
WSCP - use reduction savings benefit	-
Revised Surplus/(shortfall)	-
Resulting % Use Reduction from WSCP action	0%

2025	Total
Total Water Use	10,679
Total Supplies	15,913
Surplus/Shortfall w/o WSCP Action	5,234
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	-
WSCP - use reduction savings benefit	-
Revised Surplus/(shortfall)	-
Resulting % Use Reduction from WSCP action	0%
NOTES: (a) Volumes are in units of AF.	

8. WATER SHORTAGE CONTINGENCY PLAN

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article

The Water Shortage Contingency Plan (WSCP) for North Marin Water District (NMWD or District) is included in this Urban Water Management Plan (UWMP) as **Appendix G**. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. Consistent with CWC §10632, the WSCP includes six levels to address shortage conditions ranging from up to 10% to greater than 50% shortage, identifies a suite of demand mitigation measures for the District to implement at each level, and identifies procedures for the District to annually assess whether or not a water shortage is likely to occur in the coming year, among other things.

A summary of the key elements of the WSCP including water shortage levels and demand-reduction actions is shown in **Table 8-1**, **Table 8-2**, and **Table 8-3**. Additional details are provided in **Appendix G**.

Table 8-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10 percent	• Determination based on specific Dry Conditions as determined by the District, SCWA, or SWRCB that the District must reduce water use by up to 10%. • Includes implementation of voluntary restrictions on end uses (see **Table 8-2**) as well as agency actions (see **Table 8-3**).
2	Up to 20 percent	• Determination based on specific Dry Conditions or a Temporary Impairment of water supply as determined by the District, SCWA, or SWRCB that the District must reduce water use by up to 20%.

Shortage Level	Percent Shortage Range	Shortage Response Actions
		• Includes implementation of mandatory restrictions on end uses (see **Table 8-2**) as well as agency actions (see **Table 8-3**).
3	Up to 30 percent	• Determination based on Dry Conditions or a Temporary Impairment of water supply as determined by the District, SCWA, or SWRCB that the District must reduce water use by up to 30%. • Includes implementation of mandatory restrictions on end uses (see **Table 8-2**) as well as agency actions (see **Table 8-3**).
4	Up to 40 percent	• Determination based on specific Critical Dry Conditions or a Temporary Impairment of water supply as determined by the District, SCWA, or SWRCB that the District must reduce water use by up to 40%. • Includes implementation of mandatory restrictions on end uses (see **Table 8-2**) as well as agency actions (see **Table 8-3**).
5	Up to 50 percent	• Determination based on specific Critical Dry Conditions or a Temporary Impairment of water supply as determined by the District, SCWA, or SWRCB that the District must reduce water use by up to 50%. • Includes implementation of mandatory restrictions on end uses (see **Table 8-2**) as well as agency actions (see **Table 8-3**).
6	>50 percent	• Determination based on specific Critical Dry Conditions or a Temporary Impairment of water supply as determined by the District, SCWA, or SWRCB that the District must reduce water use by more than 50%. • Includes implementation of mandatory restrictions on end uses (see **Table 8-2**) as well as agency actions (see **Table 8-3**).
NOTES: The appropriate Stage will be enacted by the Board of Directors to respond to the corresponding estimated water shortage that may result from the following: droughts, extreme weather events, natural disasters, extended power outages, reduced deliveries from the SCWA, regulatory droughts, and other water shortage conditions.		

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
1	Other	Up to 10%	1. Encourage the non-commercial washing of privately-owned motor vehicles, trailers and boats only from a bucket and except that a hose equipped with a shut-off nozzle may be used for a quick rinse. 2. Request restaurants, hotels, cafes, cafeterias, bars or other public places where food or drink are served/purchased to serve water only upon request. 3. Navy style showering will be promoted (e.g., turn on water to wet person or persons, turn off water, lather up, scrub, then turn on water for a quick rinse, then turn off shower with free push button showerhead control valves available to customers upon request). 4. Request hotel and motel operators to provide guests with the option of choosing not to have towels and linens laundered daily. 5. Enforce water-waste prohibitions as defined in District Regulation 15, Section B. 6. Prohibit washing of sidewalks, driveways, parking areas, tennis courts, patios or other exterior paved areas except by the Novato Fire Protection District or other public agency for the purpose of public safety.	No

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
2	Other	Up to 20%	1. Continue with action and measures from Stage 1 except where superseded by more stringent requirements. 2. Prohibit use of potable water for dust control at construction sites or other locations. 3. Prohibit any use of potable water from a fire hydrant except for fighting fire, human consumption, essential construction needs or use in connection with animals. 4. Require repair of all leaks within 48 hours. 5. Restrict irrigation to three days per week, between the hours of 7pm and 9am. 6. Prohibit refilling completely drained swimming pools and/or initial filling of any swimming pools.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
3	Other	Up to 30%	1. Continue with action and measures from Stage 2 except where superseded by more stringent requirements. 2. Prohibit non-commercial washing of privately-owned motor vehicles, trailers and boats except from a bucket and except that a hose equipped with a shut-off nozzle may be used for a quick rinse. 3. Prohibit watering of any lawn, garden, landscaped area, tree, shrub or other plant except from a hand-held hose or container or drip irrigation system. Sprinklers can be used if customer maintains the volume or percent reduction pursuant to the NMWD Board of Directors determination compared to a prior year's use in same billing period. 4. Prohibit watering any portion of a golf course with potable water except the tees and greens, unless the customer maintains the specified water use reduction and mandated by the District. 5. Prohibit any non-residential use by a vehicle washing facility in excess of the volume percent or reduction pursuant to the NMWD Board of Directors determination. 6. Restrict landscape irrigation to two days per week between the hours of 7pm and 9am the following day. 7. Prohibit landscape irrigation during or within 48 hours of measurable precipitation. 8. Prohibit irrigating with potable water of lawn area on public street medians.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
4	Other	Up to 40%	1. Continue with action and measures from Stage 3 except where superseded by more stringent requirements. 2. Limit irrigation to one day per week between the hours of 7pm and 9am the following day. 3. Planting any new landscaping, except for designated drought resistant landscaping authorized by NMWD. 4. Golf courses may only use private well or recycled water for general irrigation. 5. No new annual plants, vegetables, flowers or vines may be planted until the Stage 4 mandatory period is over. An exception will be considered on a case by case basis for customers who are eliminating existing thirsty landscaping and replacing same with drought resisting landscaping prescribed by NMWD. 6. Prohibit use of single-pass cooling systems.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
5	Other	Up to 50%	1. Continue with action and measures from Stage 4 except where superseded by more stringent requirements. 2. Watering any residential lawn, or any commercial or industrial area lawn maintained for aesthetic purposes, at any time day or night during the period of March 1, through September 30. (These designated lawns will be allowed to dry up for the summer). Affected customers will be advised on tested methods for re-greening the lawns at minimum expense beginning on October 1, during a Stage 4 mandatory period if operating conditions permit. By following the prescribed instructions, the affected customers will likely avoid the cost of replacing lawns.) 3. All day and nighttime sprinkling will be discontinued. Any and all outside watering will be done only with a hand-held nozzle. An exception will be made to permit drip irrigation for established perennial plants and trees using manual or automatic time-controlled water application sufficient only for assured plant survival. 4. Limit deliveries of water to outside service area customers to that needed for human consumption, sanitation and public safety only or as stipulated in outside service agreements.	Yes
6	Other	Greater than 50%	1. Continue with action and measures from Stage 5 except where superseded by more stringent requirements. 2. All residential and CII customers shall reach a water reduction of fifty five percent (55%) from previous use.	Yes
NOTES:				

Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*
1	Other	Up to 10%	1. Distribute water bill inserts with information about water shortage and conservation. 2. Distribute special issue of WaterLine newsletter. 3. Encourage voluntary rationing. 4. Pursue vigorous enforcement of water wasting regulations and provisions of the District's Water Conservation Regulation 15. 5. Request customers to make conscious efforts to conserve water. 6. Request other governmental agencies to demonstrate leadership and implement restrictive water use programs. 7. Distribute water saving kits upon customer request, to assure availability to existing and new customers. 8. Encourage private sector use of alternate sources of water such as recycled water or private wells. 9. Encourage nighttime irrigation 10. Customers will be urged not to regularly flush their toilets for disposal of urine only.
2	Other	Up to 20%	1. Continue with actions and measures from Stage 1 except where superseded by more stringent requirements. 2. Promote District water conservation and rebate programs. 3. The District can back-feed Stafford Lake using SCWA water to offset local supply shortage in the lake.
3	Other	Up to 30%	1. Continue with action and measures from Stage 2 except where superseded by more stringent requirements.
4	Other	Up to 40%	1. Continue with action and measures from Stage 3 except where superseded by more stringent requirements.

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*
5	Other	Up to 50%	1. Continue with action and measures from Stage 4 except where superseded by more stringent requirements. 2. Increase enforcement and water waste patrols.
6	Other	Greater than 50%	1. Continue with action and measures from Stage 5 except where superseded by more stringent requirements.
NOTES:			

9. DEMAND MANAGEMENT MEASURES

☑ ***CWC § 10631 (e)***

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

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

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

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

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

(vi) Water conservation program coordination and staffing support.

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

This section provides an overview of the North Marin Water District's (NMWD's or District's) current and planned Demand Management Measures (DMMs), which include specific types and groupings of water conservation measures typically implemented by water suppliers. The District utilizes water conservation Best Management Practices (BMPs) as a method to reduce water demands, thereby reducing water supply needed. Implementation of DMMs over the past has helped the District achieve its 2015 Interim and 2020 Water Use Targets under SB X7-7 (Chapter 5).

9.1 Regional Water Conservation

The Sonoma County Water Agency (SCWA), along with the cities of Santa Rosa, Rohnert Park, Sonoma, Cotati, and Petaluma, the Town of Windsor, and NMWD, Marin Municipal Water District (MMWD) and Valley of the Moon Water District (VOMWD) (the Partners), formed the Sonoma-Marin Saving Water Partnership (SMSWP) in 2010. The SMSWP's Memorandum of Understanding was amended in May 2018, extending the term another ten years, and adding language to streamline the addition of members to the SMSWP. Two new Partners have subsequently joined, with California American Water-Larkfield joining in January 2019 and the City of Healdsburg joining in August 2019.

SCWA coordinates the work of the SMSWP in conjunction with the Water Advisory Committee (WAC), which provides input to SCWA and holds certain powers and responsibilities enumerated in the Restructured Agreement for Water Supply between SCWA and SMSWP. The SMSWP is committed to continued water conservation and is in compliance with the final 2020 gallons per capita targets established by Senate Bill X7-7. The contact info for the SMSWP Coordinator is:

Paul Piazza
Principal Programs Specialist
SCWA
paul.piazza@scwa.ca.gov
Office: 707-547-1968

9.1.1 Funding

SCWA's wholesaler water conservation programs are funded by the Partners annually through a WAC recommended budget that allocates a water conservation sub-charge for each acre-foot of water sold. The Partners have agreed to expend $15 million dollars on water conservation implementation from July 2018 through June 2028. They have also agreed to maintain membership in good standing with the California Water Efficiency Partnership (CalWEP) and implement or use best efforts to secure the implementation of any water conservation requirements added as terms or conditions of SCWA's appropriative water rights or other regulation or law.

SCWA pursues grant funding on behalf of the SMSWP to off-set some of the programmatic costs associated with water use efficiency (WUE) programs and to test new technology. In the last five years, the Agency was awarded over $1.46 million dollars for implementing WUE programs in our region.

9.1.2 Annual Report

The Partners are committed to remain as members in good standing of CalWEP and to implement water conservation measures that provide regional benefits and/or that may exceed the targets established from time to time by the Partners or the state. The Partners will implement or use best efforts to secure the implementation of any water conservation requirements and will publish an Annual Report to track progress. The Annual Report will track program implementation, highlight program milestones, and reinforce the importance of protecting and preserving water resources for future generations. The 2019/2020 Annual Report for the SMSWP is available at the SMSWP's website[17].

9.1.3 Water and Energy Education Program

The Water and Energy Education Program is a comprehensive approach to helping educators teach students the "value" of water as an important natural resource. Water and energy conservation and

[17] The link to the 2019/2020 Annual Report for the SMSWP is as follows: http://www.savingwaterpartnership.org/wp-content/uploads/SMSWP-Annual-Report-2020-FINAL.pdf.

stewardship of our local watersheds is promoted throughout the program. Students are encouraged to use water wisely and make environmentally sustainable choices to help secure a reliable source of freshwater now and in the future. The program includes classroom instructional presentations, field study opportunities at SCWA's Westside Education Facility, free curriculum materials aligned with the existing California State Frameworks and the California Science Standards, a lending library of videos, interactive models and printed materials, production of a newsletter for teachers and endorsement, participation and financial sponsorship of events, assemblies, and workshops. All of the education programs and materials are free to teachers in the service area, which covers over 200 schools throughout Sonoma and northern Marin counties. Due to the COVID-19 pandemic, the entire classroom curriculum was adapted in 2020 to provide both synchronous and asynchronous lessons for remote learning.

The total number of students receiving direct instruction in 2019/2020 was 8,030 (2,094 students in field study programs and 5,936 in classroom programs). Three hundred (300) adults participated in the field study program while serving as adult chaperones with participating classes. An additional 108 classes (2,388 students) signed up for programs that were canceled due to the COVID-19 pandemic.

9.1.4 Public Outreach Program

The SMSWP develops an annual regional outreach campaign that aligns with our current water supply conditions and promotes water use efficiency programs. Over the last few years, the campaigns have included the following:

- Saving Water Ensures Water for What You Love (2020),
- Together Making Water Conservation a California Way of Life (2019),
- There's Never Enough to Waste. (2017 & 2018),
- Thank You for Doing Your Part (2016), and
- Take it From the Tap (2016).

SCWA, in collaboration with the members of the SMSWP, produces collateral material that aligns with the specific campaign. SCWA coordinates an annual media buy that includes outreach in English and Spanish. Each member of the SMSWP can choose to supplement the campaign with their own media buys. The buys generally include the following:

- Radio (streaming and broadcast),
- Newsprint and online digital media placements in 14 various local publications,
- Sonoma County Fair presence,
- Social Media (Facebook, Twitter, Instagram, YouTube, NextDoor),
- Mall banners, and
- Movie theater trailers.

9.1.5 Regional Programs

SCWA on behalf of the SMSWP implements numerous regional programs. This includes offering staff support for interested Partners as a cost-effective way to offer local programs to customers of smaller agencies. Some of these programs are:

- High Efficiency Clothes Washer Water Rebate – a rebate for replacing a top-loading clothes washer with a qualifying front-loading clothes washer.
- Green Business Program – Certification for local businesses that are going green.
- Qualified Water Efficient Landscaper Training Program – A low-cost professional certification program that educates landscapers about irrigation system auditing, while providing customers with a trusted source for knowledgeable hired help that can save them water.
- Eco-Friendly Garden Tour – An annual self-guided garden tour in Sonoma County and North Marin that promotes sustainable landscaping practices. This tour transitioned to an online video format in 2020 to adapt to the COVID-19 pandemic.
- Garden Sense – A free garden consultation program open to all Sonoma County residents. Consultants provide site-specific advice on lawn removal, sprinkler conversion to drip irrigation, and low water use plant selection.
- DIY Energy and Water Savings Toolkit – The Do-It-Yourself (DIY) Home Energy and Water Saving Toolkits are stocked with energy and water saving supplies that can help measure how much energy or water is being consumed in the home and make easy upgrades to your home to help save money on the utility bills.
- Landscape Design Templates – These free, front yard designs are scalable to fit landscaped areas up to 2,500 square feet, ready-to-permit, and in compliance with local Water Efficient Landscape Ordinances.
- Water Smart Plant Label – A free water smart plant labeling program to local nurseries. The water smart plant label highlights low water use plants to nursery customers and promotes sustainable landscaping practices in Sonoma and Marin counties.
- Water-Energy Rebates for Restaurants and Food Service Facilities – a rebate program for replacing inefficient commercial kitchen equipment with new water and energy efficient models.

SCWA supports promoting new and innovative models to increase water use efficiency in our region. Some of the pilot projects we have collaborated with in the past include:

- PAYS Program (Windsor) – An on-bill financing program that allows water customers to fund their own water and energy improvements with a long-term payback on their water bill.
- SmartMarkets Pilot (VOMWD) – A water market that allows for 'eco-shares' to be earned for reducing demand and redeemed for various incentives.
- Water Smart Software (Cotati) – A community based social marketing platform that compares a customer's water use to their neighbors to encourage behavioral change.
- Barnacle Pilot Program (All) – An online platform that provides real-time water use data to the customer outside of the water utilities billing infrastructure.
- Unmetered Flow Reducer (NMWD) – An in-line device that is placed between the meter and the customer connection that allows small leaks to be 'batched' through the meter, thus reducing unaccounted for water from low flow leaks and allowing the customer to be notified that a leak in occurring.

SCWA participates in numerous regional and statewide initiatives to ensure the SMSWP is on the forefront of water use efficiency, legislation, and conservation planning, such as:

- California Water Efficiency Partnership (Programs Subcommittee, Research Subcommittee), successor organization of the former California Urban Water Conservation Council,
- California Irrigation Institute,
- Association of California Water Agencies (Water Management and Water Use Efficiency Subcommittees),
- Russian River Watershed Association, and
- California Landscape Contractors Association.

The SMSWP has received notable recognition for effective collaboration and program implementation. Below are the awards the SMSWP has received.

- EPA Water Sense Excellence Award 2020 and Sustained Excellence Award 2020,
- EPA Water Sense Excellence Award 2019 and Sustained Excellence Award 2019,
- EPA Water Sense Excellence Award 2018 and Sustained Excellence Award 2018,
- EPA Water Sense Excellence Award 2017 and Sustained Excellence Award 2017, and
- EPA Water Sense Partner of the Year 2016.

9.2 Agency Water Conservation

☑ ***CWC § 10631 (e)***

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

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

In addition to the regional conservation effort partnering with the SMSWP, the District also implements DMMs at a local scale.

The District was previously a member of the California Urban Water Conservation Council (CUWCC). The CUWCC was created to assist in increasing water conservation statewide, under a Memorandum of Understanding (MOU). As signatory to the MOU, the District has pledged its good faith effort towards implementing BMPs identified in the CUWCC MOU Regarding Urban Water Conservation. The two primary purposes of the MOU were as follows:

- to expedite implementation of reasonable water conservation measures in urban areas; and
- to establish assumptions for use in calculating estimates of reliable future water conservation savings resulting from proven and reasonable conservation measures. Estimates of reliable savings are the water conservation savings that can be achieved with a high degree of confidence in a given service area.

The CUWCC has been dissolved since the 2015 UWMP, and thus BMP annual reports are no longer available. However, the District continues to implement DMMs in general accordance with the CUWCC

BMPs. A description of the nature and extent of each DMM implemented over the last five years is provided below. Additional information regarding DMM implementation is provided in **Appendix B**.

9.2.1 DMM 1 – Water Waste Prevention Ordinances

The District enforces a strict water waste prevention/ prohibition regulation as required in the District's Regulation 15 – Water Conservation – Novato Service Area dated January 2016 (**Appendix H**). This regulation explicitly states that the waste of water is to be prohibited, and it also lists all the prohibited water uses and exempt water uses. The excerpts are provided below:

"Customers shall not permit any water furnished by the District for the following nonessential uses:

- The washing of sidewalks, walkways, driveways, parking lots and other hard surfaced areas by direct hosing when runoff water directly flows to a gutter or storm drain, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety;
- The escape of water through breaks or leaks within the customers' plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of seventy-two (72) hours after the customer discovers such a break or leak or receives notice from the District, is a reasonable time within which to correct such break or leak, or, as a minimum, to stop the flow of water from such break or leak;
- Irrigation in a manner or to an extent which allows excessive run-off of water or unreasonable over-spray of the areas being watered. Every customer is deemed to have his/her water system under control at all times, to know the manner and extent of his/her water use and any run-off, and to employ available alternatives to apply irrigation water in a reasonably efficient manner;
- Washing cars, boats, trailers or other vehicles and machinery directly with a hose not equipped with a shutoff nozzle;
- Water for non-recycling decorative water fountains;
- Water for new non-recirculating conveyor car wash systems;
- Water for new non-recirculating industrial clothes wash systems; and
- Water for single pass coolant systems.

Exempt Water Uses. All water use associated with the operation and maintenance of fire suppression equipment or employed by the District for water quality flushing and sanitation purposes shall be exempt from the provisions of this section. Use of water supplied by a private well or from a recycled water, gray water or rainwater utilization system is also exempt."

9.2.2 DMM 2 – Metering

☑ ***CWC § 526 (a)***

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

(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings constructed prior to January 1, 1992, located within its service area.

(2) On and after March 1, 2013, or according to the terms of the Central Valley Project water contract in operation, charge customers for water based on the actual volume of deliveries, as measured by a water meter.

☑ ***CWC § 527 (a)***

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

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

All customer connections within the District are metered.

9.2.3 DMM 3 – Conservation Pricing

The District bills customers using a three-tier rate system for residential customers and a seasonal rate (rate increase in summer months) for non-residential customers. The volumetric tiers for residential customers are as follows:

- Tier 1 – up to 262 gallons per day (GPD);
- Tier 2 – 262 – 720 GPD; and
- Tier 3 – Greater than 720 GPD.

For non-residential customers, a summer water rate for is charged for July through September and a winter rate is charted for October through June.

The current water rates can be found on the District's website at: https://nmwd.com/account/rates/

9.2.4 DMM 4 – Public Education and Outreach

NMWD implements a full-scale public information program including newsletters, bill stuffers, newspaper advertisements, public outreach events, and other programs including social media. As discussed in Section 9.1, the District is a member of a regional water conservation partnership, the SMSWP, which conducts the bulk of public education efforts in the region. Information provided ranges from promotion of conservation programs to water supply/quality, and hardware distribution.

Through the regional SMSWP water conservation school education and outreach programs from the 2015-2016 to 2019-2020 school years, 3,634 students were reached by direct instruction, and 7,175 students

were reached through indirect instruction such as assemblies, video and poster contests, and other educational materials (EKI, 2020).

9.2.5 DMM 5 – Programs to Assess and Manage Distribution System Real Loss

The District has a proactive program to address and minimize distribution system water loss. As noted in Section 4.1.4, the District performs annual water loss audits consistent with CWC §10608.34 using the American Water Works Association (AWWA) Free Water Audit Software version 5.0, which is then validated by an AWWA California-Nevada Section-Certified California Water Audit validator prior to submission to Department of Water Resources (DWR). The District has been performing these audits periodically for years prior to the Senate Bill (SB) 555 State-mandate. The results of the last five years of water audit data are summarized in Section 4.1.4, and copies of the audit reports are available through DWR's Water Use Efficiency Data Portal[18].

9.2.6 DMM 6 – Water Conservation Program Coordination and Staffing Support

The District employs a full time Water Conservation Coordinator to implement the Water Conservation and Public Outreach Programs. Contact information for the District's Water Conservation Coordinator is listed below:

Name: Ryan Grisso

Phone: (415) 761-8933

Email: rgrisso@nmwd.com

9.2.7 DMM 7 – Other DMMs

The District's *2020 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update* (**Appendix B**) provided descriptions of conservation program implementation efforts by the District, and detailed analysis of program participation trends for five representative programs. Conservation programs implemented by the District include high-efficiency washer rebates, turf replacement rebates, Water Smart survey programs, toilet rebates for residential and commercial customers, weather-based irrigation controller rebates for residential and commercial customers, pool cover and hot water recirculation rebates, and more. For additional information related to these DMMs, refer to **Appendix B**.

[18] DWR's Water Use Efficiency Data Portal: https://wuedata.water.ca.gov/awwa_plans.

9.3 Planned Implementation to Achieve Water Use Targets

☑ ***CWC § 10631 (e)***

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

(1) (A) … The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

Beginning in 2023, urban water retailers will be required to report on "annual water use objectives" by November 1 of each year and to achieve these objectives by 1 January 2027 (per CWC §10609). The annual water use objectives will be calculated based on standards for indoor residential water use, outdoor residential water use, and distribution system water loss. Additionally, it is anticipated that performance-based standards for the commercial, industrial, and institutional sectors, separate from the annual water use objectives, will also be developed by DWR and implemented in the future. However, the specific standards that will be used to determine a retailer's annual urban water use objectives are currently under development by DWR, and thus, the annual urban water use objectives for the District cannot be calculated or estimated. Therefore, the District intends to continue implementing DMMs both locally and through the SMSWP and will evaluate potential adjustments needed to these programs as the annual water use objective standard methodologies are developed in the coming years. The District's *2020 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update*, provided in **Appendix B**, evaluates several options for future conservation program implementation.

10. PLAN ADOPTION AND SUBMITTAL

This chapter provides information on a public hearing, the adoption process for the Urban Water Management Plan (UWMP or Plan) and Water Shortage Contingency Plan (WSCP), the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP or WSCP.

10.1 Notification of UWMP Preparation

☑ ***CWC § 10621 (b)***

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

North Marin Water District (NMWD or District) sent a letter to fifteen entities including Marin and Sonoma County and other local agencies informing them that the District was in the process of updating its UWMP and WSCP and soliciting their input in the update process. A listing of the entities contacted is provided in **Table 2-4**; the notices are included in **Appendix C** for reference. The letter was sent more than 60 days before the public hearing as required by code.

10.2 Notification of Public Hearing

☑ *CWC § 10642*

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

10.2.1 Notice to Cities and Counties

At least two weeks prior to the public hearing, the entities mentioned above in Section 10.1 were notified that the UWMP and WSCP public hearing would be occurring on 15 June 2021 at 6:00PM. The letter informed them of the locations the Public Review Draft 2020 UWMP and the updated WSCP would be available for review and welcoming their input and comments on the document. The Public Review Draft 2020 UWMP and the WSCP were available for public review on the District's website. **Table 2-4** lists the cities, counties, and other agencies that were notified. Copies of these letters are provided in **Appendix C**.

10.2.2 Notice to the Public

The District issued public notifications soliciting public input during the preparation of 2020 UWMP and the WSCP. On 1 June 2021 and 7 June 2021, the District published a notice in the *Marin Independent Journal* informing the public that the 2020 UWMP and WSCP would be available for public review on the District's website, consistent with requirements of California Government Code 6066. The notice also informed the public that the 2020 UWMP and WSCP public hearing would be held virtually on 15 June 2021. A copy of this notice is included in **Appendix D.**

10.3 Public Hearing and Adoption

☑ ***CWC § 10608.26***

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

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

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

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

Prior to adopting the Plan, the District held a formal public hearing to present information on the 2020 UWMP and WSCP on 15 June 2021 at 6:30 PM, in a virtual meeting.

As part of the public hearing, the District provided the audience with information on compliance with the Senate Bill (SB) X7-7, including its baseline daily per capita water use, water use targets, implementation plan, and 2020 compliance.

This UWMP was adopted by Resolution No. 21-09 by the District Board during its 15 June 2021 Board meeting. The WSCP included as **Appendix G** was adopted by the same resolution during the same meeting. A copy of the resolution is included in **Appendix I**.

10.4 Plan Submittal

☑ ***CWC § 10621***

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

☑ ***CWC § 10635 (c)***

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

☑ ***CWC § 10644***

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

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

This UWMP and WSCP were submitted to DWR within 30 days of adoption and by the 1 July 2021 deadline. The submittal was done electronically through Water Use Efficiency Data Portal, an online submittal tool. The adopted Plan was also sent to the California State Library and Marin and Sonoma Counties.

10.5 Public Availability

☑ ***CWC § 10645***

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

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

On or about 1 July 2021, electronic versions of the draft 2020 UWMP and WSCP were made available for review at the District's website (https://www.nmwd.com). Printed hard copies were made available by appointment.

10.6 Amending an Adopted UWMP or Water Shortage Contingency Plan

☑ ***CWC § 10644 (b)***

If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

If the Plan is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended document.

11. REFERENCES

ABAG, 2018. Association of Bay Area Governments, Plan Bay Area Projections 2040, released during November 2018.

ABAG, 2020. Association of Bay Area Governments, Regional Housing Needs Allocation Proposed Methodology: San Francisco Bay Area, 2023-2031, released on October 2020: https://abag.ca.gov/sites/default/files/rhna_methodology_report_2023-2031_finalposting.pdf.

AWE, 2016. Alliance for Water Efficiency, Water Conservation Tracking Tool Version 3, released in July 2016.

California Building Standards Commission. CAL Green Code, effective 2014 with supplements effective 2015: http://www.bsc.ca.gov/Home/CALGreen.aspx

City of Novato, 2014. City of Novato Housing Element Update 2015-2023, adopted by the City of Novato on 18 November 2014.

City of Novato, 2020. City of Novato General Plan 2035, adopted 27 October 2020: https://www.novato.org/home/showpublisheddocument?id=30461.

DWR, 2006. California Groundwater Bulletin 118, dated January 2006.

DWR, 2016. Methodologies for Calculating Baseline and Compliance Urban Per Capita Water, California Department of Water Resources Division of Statewide Integrated Water Management Water Use and Efficiency Branch, updated March 2016.

DWR, 2019. Sustainable Groundwater Management Act 2018 Basin Prioritization, State of California, January 2019.

EKI, 2020. 2020 Water Demand Analysis and Water Conservation Measure Update, prepared for North Marin Water District on December 2020.

Marin County, 2014. Marin Countywide Plan, adopted 6 November 2007, amended 24 September 2013, reprinted October 2014: https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_2015_update.pdf .

Marin County, 2018. 2018 Marin County Multi-Jurisdictional Local Hazard Mitigation Plan, 2018.

NMWD, 2016. 2015 Urban Water Management Plan, North Marin Water District, June 2016.

NMWD, 2019. 2018 Novato Water System Master Plan Update, September 2019. North Marin Water District.

Nute Engineering, 2006. 2006 Recycled Water Implementation Plan, North Marin Water District, prepared by Nute Engineering, May 2006.

Santa Rosa Plain Basin Advisory Panel, 2014. Santa Rosa Plain Watershed Groundwater Management Plan, Santa Rosa Plain Basin Advisory Panel, 2014.

SCWA, 2016. 2015 Urban Water Management Plan, prepared by Brown and Caldwell, June 2016.

SCWA, 2018. Sonoma County Water Agency Local Hazard Mitigation Plan, dated 16 October 2018.

SCWA, 2021. Draft 2020 Urban Water Management Plan, provided by SCWA staff on 16 April 2021.

U.S. Census, 2021. U.S. Census Bureau QuickFacts website, obtained on 16 February 2021, https://www.census.gov/quickfacts/fact/table/US/PST045219

NORTH MARIN WATER DISTRICT

Appendix A

Completed UWMP Checklist

NORTH MARIN WATER DISTRICT

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Chapter 1
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Section 1.6
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1 and Table 2-1
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.2.2 and Table 2-4
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 1.3 Section 2.2.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.2.1
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Chapter 3
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.4
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.1.1 and Table 3-1
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.3 and Table 3-3
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.1 and 5.1, Table 3-1
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Chapter 4, Tables 4-1 to 4-4
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.1.4, Table 4-3
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Section 4.2.1, Table 4-4
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.4, Table 4-7
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.1.4, Table 4-3
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.2.3, Table 4-6
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.4
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.4, Table 5-5
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.4, Table 5-5
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.3
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Appendix F
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 7.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change*.	System Supplies	Section 6.10.1, Section 7.1.3
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Chapter 6
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Sections 6.6 to 6.9
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.9 and Table 6-9
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.3
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.1

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.4
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.5 and Table 6-1
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.3 and Tables 6-4 and 6-5

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-4
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-4
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-5
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5 and Table 6-6
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.5.2 and Table 6-2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Sections 6.9 and 6.10 and Table 6-9
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.11 and Table 6-10
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Chapter 7
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.5
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.5.1
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.5.2 and Table 7-8
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.3 and Tables 7-4 to 7-6
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Sections 6.10.1, and 7.1.3
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Chapter 8, Appendix G
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix G – Chapter 2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix G – Chapters 12 and 13
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision- making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix G – Chapter 4
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix G – Chapter 4
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix G – Chapter 5
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Appendix G – Chapter 5

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix G – Chapter 6 and Table 6-2
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix G – Chapter 6 and Table 6-1
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix G – Section 6.3
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Appendix G – Section 6.4
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix G – Section 6.2 and Table 6-1
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix G – Chapter 7
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix G – Chapter 8

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix G – Chapter 8
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Appendix G – Chapter 9
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix G – Chapter 10
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix G – Chapter 5
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix G – Chapter 8
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix G – Chapter 11
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix G – Chapter 11

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Appendix G – Chapter 11
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix G – Chapter 12
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix G – Section 6.2.1
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Appendix G – Chapter 14
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Appendix G – Chapter 14
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Chapter 9
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.1
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2.1

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.6
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4

NORTH MARIN WATER DISTRICT

Appendix B

2020 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update, North Marin Water District

NORTH MARIN
WATER DISTRICT

2020 Water Demand Analysis and Water Conservation Measure Update

North Marin Water District

December 2020
(EKI C00004.00)

Prepared by:
EKI Environment & Water, Inc.
2001 Junipero Serra Boulevard, Suite 300
Daly City, California 94014
(650) 292-9100

2020 Water Demand Analysis and
Water Conservation Measure Update
North Marin Water District

Table of Contents

1. INTRODUCTION 1-1
2. REGULATORY CONTEXT 2-1
2.1. 2020 UWMP Demand Projections Requirements 2-1
2.2. New Requirements for 2020 UWMPs and Future Demand Planning 2-2
2.2.1. Annual Urban Water Use Objectives 2-2
2.2.2. Supply Reliability 2-4
2.2.3. Water Shortage Contingency Plans 2-4
3. WATER USE CHARACTERISTICS 3-1
3.1. Historical Total and Per Capita Water Use 3-1
3.2. Historical Average Water Use Per Account 3-1
3.3. Change in Residential Water Use Pre- and Post-Drought 3-2
3.4. Residential Water Use by Dwelling Unit and Age of Construction 3-3
3.5. Estimated Indoor and Outdoor Water Use 3-3
4. WATER DEMAND PROJECTIONS 4-1
4.1. Basis for Account Growth Projections 4-1
4.2. Planned Development Within the Service Area 4-3
4.3. Water Demand Factors 4-3
4.3.1. Potable Water 4-3
4.3.2. Non-Revenue Water (Potable Water System) 4-5
4.3.3. Recycled Water 4-5
4.4. Passive Water Savings Estimates 4-5
4.5. Projected Water Demand Through 2045 4-5
5. CONSERVATION PROGRAM PARTICIPATION 5-1
5.1. Conservation Programs 5-1
5.2. Historical Conservation Program Participation 5-3
5.3. Estimated Savings from Past Conservation Programs 5-3
5.3.1. Estimated Water Savings Based on AWE Model 5-3
5.3.2. Estimated Water Savings for Five Selected Programs Based on Customer Billing Data 5-4
5.4. Spatial Trends in Program Participation 5-6
5.5. Building Stock Characteristics 5-6
5.6. Demographic Characteristics of Residential Conservation Program Participation 5-7
5.6.1. Household Income Trends 5-7
5.6.2. Homeownership Trends 5-8
5.6.3. Household Age Trends 5-9
5.7. Summary 5-9
6. CONSERVATION PROGRAM UPDATE 6-1
6.1. Methodology for Screening of Potential Water Conservation Programs 6-1

Table of Contents

6.2. Screening of Regional Conservation Measures 6-2
6.2.1. Retailer Actions and Water Rate Based Conservation Programs 6-2
6.2.2. Public Outreach and Education Based Conservation Programs 6-2
6.2.3. Device and Financial Incentive Based Conservation Programs 6-3
6.2.4. Policy and Regulation Based Conservation Programs 6-3
6.2.5. Regional Program Screening Findings 6-4
6.3. Screening of Local Conservation Measures 6-4
6.4. Evaluation of Future Water Conservation Programs 6-5
7. CONCLUSION 7-1
8. REFERENCES 8-1

TABLES

Table 3-1. Water Use and Population
Table 3-2. Water Use by Customer Sector
Table 3-3 Number of Accounts by Customer Sector
Table 3-4a. Per Account Water Use by Customer Sector
Table 3-4b. Per Dwelling Unit Water Use for Residential Sectors
Table 3-5. Residential Water Use by Age of Construction
Table 3-6. Monthly Water Use
Table 3-7. Estimated Indoor and Outdoor Water Use

Table 4-1. Population and Employment Growth Projections
Table 4-2. Historical and Projected Account Growth Rate by Customer Sector
Table 4-3. Change in Number of Accounts based on Projected Growth
Table 4-4. Potential Potable Water Demand Factors Considered
Table 4-5. Selected Water Demand Factors
Table 4-6. Projected Water Demand

Table 5-1. Description of Conservation Programs
Table 5-2. Summary of Conservation Program Participation
Table 5-3. Summary of Conservation School Education Program Participation
Table 5-4. Estimated Water Savings Achieved by Conservation Programs and Passive Savings
Table 5-5. Average Estimated Water Savings Achieved by Selected Conservation Programs from 2010-2017
Table 5-6a. Estimated Water Savings Achieved by the HECW Rebate Program
Table 5-6b. Estimated Water Savings Achieved by the HET Rebate Program
Table 5-6c. Estimated Water Savings Achieved by the Cash for Grass Rebate Program

2020 Water Demand Analysis and
Water Conservation Measure Update
North Marin Water District

Table of Contents

Table 5-6d. Estimated Water Savings Achieved by the WBIC Rebate Program
Table 5-6e. Estimated Water Savings Achieved by the Water Smart Survey Program
Table 5-7. Building Stock Characteristics by Program Participants
Table 5-8a. Residential Customer Program Participation by Median Household Income
Table 5-8b. Residential Customer Program Participation by Percentage of Renters
Table 5-8c. Residential Customer Program Participation by Median Household Age

Table 6-1. Regional Prioritization of Conservation Measures and Programs
Table 6-2. North Marin Water District Prioritization of Conservation Measures and Programs
Table 6-3a. Conservation Program Scenarios
Table 6-3b. Costs and Savings of Potential Conservation Programs
Table 6-3c. Comparison of Program Scenarios – Costs and Savings

FIGURES

Figure 1-1. Participating Sonoma-Marin Saving Water Partnership Members
Figure 1-2. North Marin Water District Service Area

Figure 3-1. SFR Water Use over Time

Figure 5-1a. Participation Density for HECW Rebate Program
Figure 5-1b. Participation Density for HET Rebate Program
Figure 5-1c. Participation Density for Water Smart Survey Program
Figure 5-1d. Participation Density for Cash for Grass Rebate Program
Figure 5-1e. Participation Density for WBIC Rebate Program
Figure 5-2. Age of Building Stock
Figure 5-3a. Median Household Income
Figure 5-3b. Percentage of Renters
Figure 5-3c. Median Household Age
Figure 5-4. SFR Customers to Potentially Target with Cash For Grass Program Outreach

APPENDICES

Appendix A. California Water Code Revisions per AB-1668, SB-606, and SB-664, Redlines prepared by DWR
Appendix B. AWE Model Assumptions
Appendix C. Methodology for Conservation Program Savings Analyses
Appendix D. Prioritization and Screening of Future Water Conservation Measures

ABBREVIATIONS AND ACRONYMS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
AFY	acre-feet per year
AMI	advanced metering infrastructure
AWE	Alliance for Water Efficiency
CA	California
CEQA	California Environmental Quality Act
CII	commercial, industrial, and institutional
CWC	California Water Code
DMM	Demand management measure
DOF	Department of Finance
DRA	drought risk assessment
d.u.	Dwelling unit
DWR	Department of Water Resources
GPCD	gallons per capita day
GPD	gallons per day
HECW	high efficiency clothes washer
HET	high efficiency toilet
Irrig.	irrigation
MFR	multi-family residential
MWELO	Model Water Efficient Landscape Ordinance
NMWD	North Marin Water District
QWEL	Qualified Water Efficient Landscaper
RHNA	Required Housing Needs Allocation
SB	Senate Bill
SCWA	Sonoma County Water Agency
SFR	single-family residential
SMSWP	Sonoma-Marin Saving Water Partnership
sq ft	square feet
SWRCB	State Water Resources Control Board
UHET	ultra high-efficiency toilet
UWMP	Urban Water Management Plan
WBIC	Weather-Based Irrigation Controller
WSA	Water Supply Assessment
WSCP	Water Shortage Contingency Plan

1. INTRODUCTION

In preparation for development of their 2020 Urban Water Management Plan (UWMP) updates, nine members of the Sonoma-Marin Saving Water Partnership (SMSWP or Water Contractors) coordinated to conduct a joint update of their water demand projections and water conservation planning efforts (i.e., the *2020 Water Demand and Conservation Project*). The participating SMSWP members include: City of Cotati, City of Petaluma, City of Rohnert Park, City of Santa Rosa, City of Sonoma, Marin Municipal Water District, North Marin Water District, Town of Windsor, and Valley of the Moon Water District. These nine agencies are shown on **Figure 1-1**.

The goals of the *2020 Water Demand and Conservation Project* were to apply a common methodology to conduct the following analysis for each Water Contractor:

- Evaluate and document recent historical water use characteristics and trends, including population and account growth;
- Estimate projected water demands for the years 2025 through 2045 to support both the 2020 UWMP update and coordination and planning efforts with Sonoma County Water Agency (SCWA);
- Update the suite of common regional conservation measures that are being considered for implementation in the future;
- Review and document past participation in water conservation programs; and
- Estimate the potential water savings associated with future water conservation program implementation.

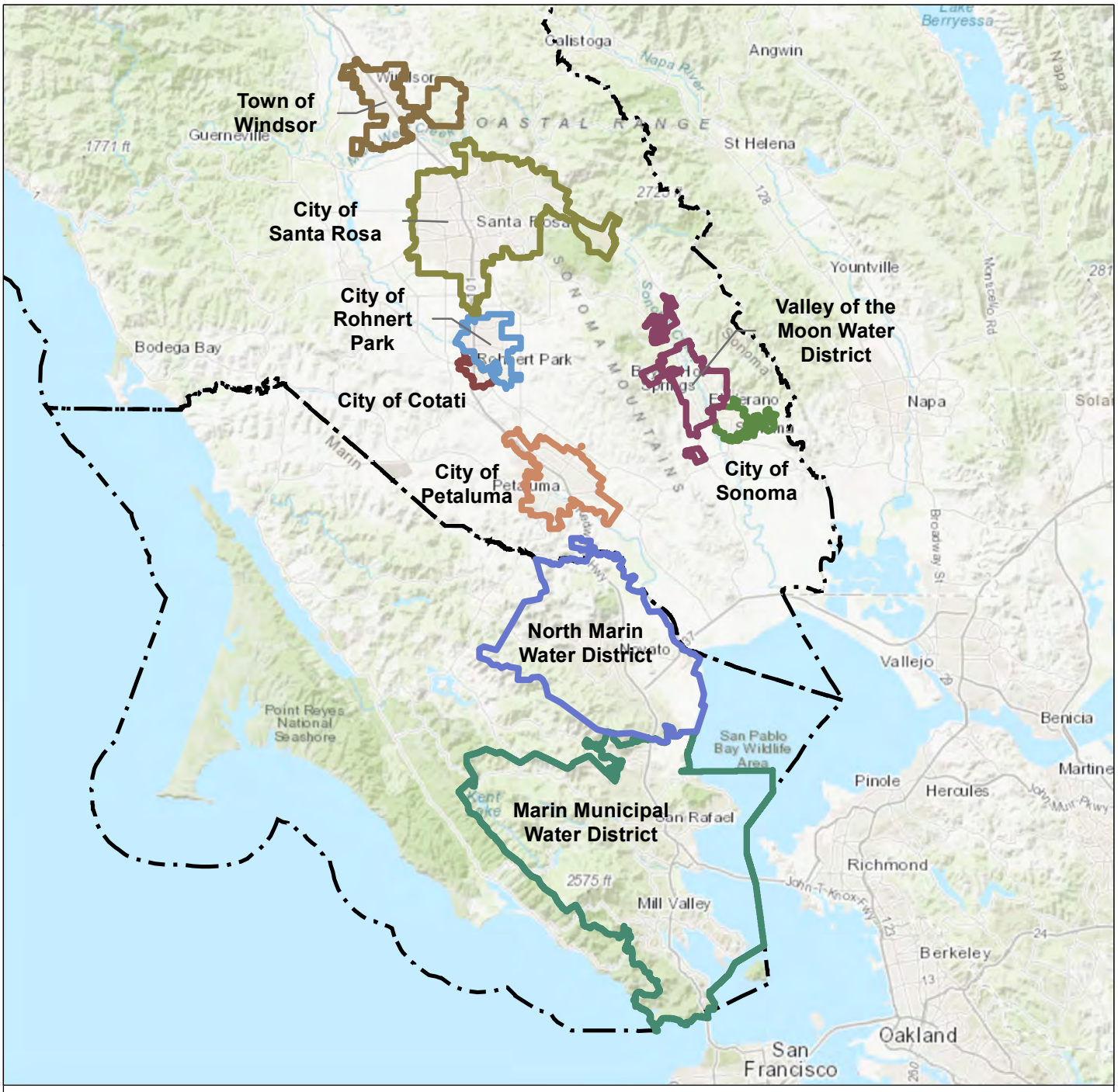
This 2020 Water Demand and Conservation report presents the results for the North Marin Water District (District), which is located in Marin County and serves a population of approximately 61,637 people (**Figure 1-2**). The District's water supplies include surface water purchased from the Sonoma County Water Agency (SCWA), local surface water from Safford Lake, and recycled water produced both inside and outside of the District (NMWD, 2016). Potable water is supplied to urban customers, and recycled water is served primarily for golf course and urban landscape irrigation customers, as well as three local drive-through automatic car washes. Over the years, the District has worked to increase water efficiency (conservation) among itself and its customers in response to both the SB X7-7 UWMP requirements and as part of the regional SMSWP. This conservation has been achieved through the implementation of water conservation programs, including some administered by the District and some administered through the regional SMSWP.

This 2020 Water Demand and Conservation report is organized as follows:

- **Section 1** identifies the goals and objectives of this report;
- **Section 2** provides the regulatory context for the demand projections described in this report as well as new requirements related to UWMPs and long-term demand planning that agencies will need to consider in development of their 2020 UWMPs;
- **Section 3** describes historical water use patterns and characteristics within the District;

- **Section 4** describes the projected water demands through 2045, including the assumptions and methodology used;
- **Section 5** documents past participation in conservation programs and estimated savings associated with program implementation, and presents the results of a detailed analysis of program participation trends for five select conservation programs;
- **Section 6** documents the water conservation measure screening process, identifies individual programs and program scenarios for potential future implementation by the District, and presents the results of a benefit-cost analysis and an estimate of the potential water savings associated with these conservation programs;
- **Section 7** provides conclusions regarding the main findings of the report; and
- **Section 8** provides key references and sources.

Small tables are provided within text throughout the document. Figures and large tables and charts are provided at the end of each section.



Legend

- County Boundary
- City of Cotati
- City of Petaluma
- City of Rohnert Park
- City of Santa Rosa
- City of Sonoma
- Marin Municipal Water District
- North Marin Water District
- Town of Windsor
- Valley of the Moon Water District

Notes

1. All locations are approximate.

Sources

1. Service area boundary provided by respective agencies.
2. Basemap provided by ESRI.

N

0 8 16

Miles

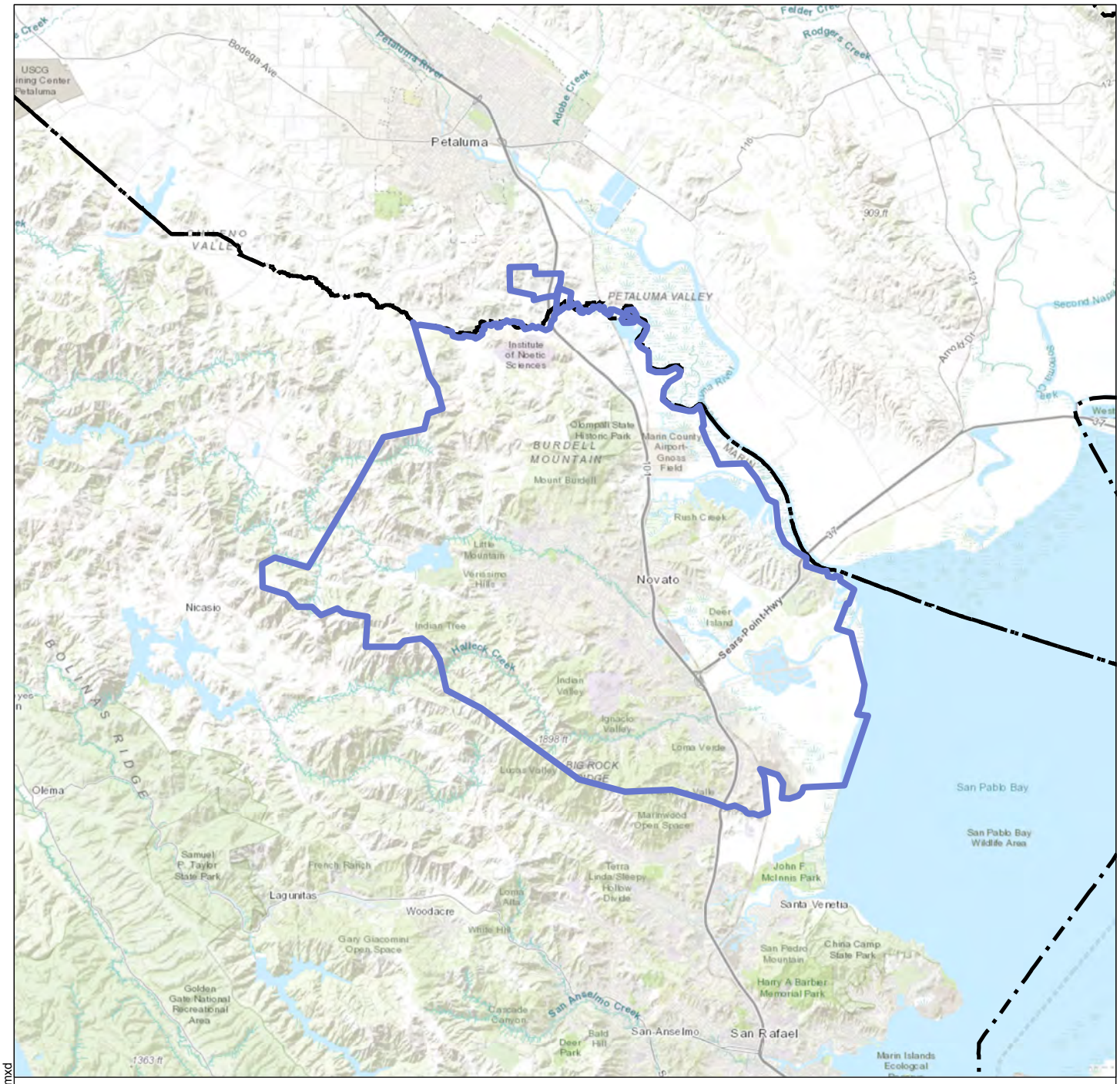
Participating Sonoma-Marin Saving Water Partnership Members

Sonoma-Marin Saving Water Partnership
December 2020
C00004.00

Figure 1-1

eki environment & water

Path: X:\C00004_SonomaMarin\Map\2020\08\SMSWP Map_20200904.mxd



Legend

- County Boundary
- North Marin Water District

N

0 3 6

Miles

North Marin Water District Service Area

Notes

1. All locations are approximate.

Sources

1. Service area boundary provided by North Marin Water District.
2. Basemap provided by ESRI.

eki environment & water

North Marin Water District, CA
December 2020
C00004.00

Figure 1-2

Path: X:\C00004_SonomaMarin\Map\2020\08\AgencyBoundaryMaps_20200904.mxd

2. REGULATORY CONTEXT

This section is provided both as regulatory background for the requirements to project future demand in the 2020 UWMP, and for elements of the District's 2020 UWMP that are beyond the scope of the *2020 Water Demand and Conservation Project,* such as consideration of supply reliability, water shortage contingency planning, and the annual urban water use objectives retailers will be required to report on in 2023 and meet by 2027.

2.1. 2020 UWMP Demand Projections Requirements

California Water Code (CWC) § 10631, excerpted below, describes the requirements to develop water demand projections that consider water use by customer sector, incorporate distribution system water loss, and account for anticipated water savings. As described further in Section 4, water demand projections were developed for the District using a land-use based approach that is consistent with these requirements, and can be incorporated into the District's 2020 UWMP.

CWC § 10631

A plan shall be adopted in accordance with this chapter that shall do all of the following:

…

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

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

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

(I) Agricultural.

(J) Distribution system water loss.

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

…

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

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

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

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

2.2. New Requirements for 2020 UWMPs and Future Demand Planning

Through the recent *Making Water Conservation a California Way of Life* (Assembly Bill [AB]-1668/Senate Bill [SB]-606) and other legislation, the State has made numerous changes to the requirements for UWMPs and related water conservation planning efforts. In many cases, the updated regulations reference details and methodologies to be developed by the California Department of Water Resources (DWR), and/or are somewhat vague and will benefit from the development of guidelines/further clarification by DWR. DWR is currently developing an updated guidebook to support the development of the 2020 UWMPs, which is expected to be complete by late 2020. This new guidebook is anticipated to provide direction to retailers with respect to many elements of the new legislation.

A summary of key changes to various elements of 2020 UWMP and related planning efforts is provided below. Copies of the revisions to relevant sections of the California Water Code per AB-1668, SB-606, and SB-664 are provided in **Appendix A.**

2.2.1. Annual Urban Water Use Objectives

Beginning in 2023,[1] retailers will be required to report on "annual water use objectives" by November 1 of each year, per CWC § 10609. The specific standards that will be used to determine a retailer's annual urban water use objectives are currently under development and are the source of a great deal of uncertainty with respect to the long-term water conservation and demand planning as part of the 2020 UWMP. Although the 2020 UWMP will not identify or calculate these new annual urban water use objectives, the new standards will become effective within the UWMP planning horizon. Per CWC § 10609.25, retailers will be required to "provide a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027." Details regarding the annual urban water use objectives and other requirements are expected to evolve significantly over the next two years.

- **Residential outdoor water use:** Per CWC § 10609.6, DWR and California State Water Resources Control Board (SWRCB) "shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor residential use" which "incorporate the principles of the model water efficient landscape" and "apply to irrigable lands." DWR is currently working with a contractor to measure all of the single- and multi-family landscape (irrigable) area within urban water suppliers' service areas across the state based on aerial imagery. The result of these measurements will become the basis for each retailer's residential landscape water use component of the annual water use objectives. In order to accurately calculate and compare against this metric, retailers will be responsible for identifying what dedicated irrigation accounts are associated with residential water use (including multi-family residential), and what dedicated irrigation accounts are associated with commercial, industrial and institutional (CII) use. The

[1] DWR acknowledged publicly on 5 December 2019 that this and other related deadlines are likely to slip. DWR indicated that compliance with these objectives will most likely begin in 2024.

landscape area measurement process is being lead through a stakeholder workgroup process with periodic public meetings.

- **Residential indoor water use:** Per CWC § 10609.4.(a), "(1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily. (2) Beginning January 1, 2025, and until January 1, 2030, the standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard recommended pursuant to subdivision (b). (3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b)." While the legislation appears to be clear on the method to calculate the indoor residential water use component, the SWRCB has begun the California Environmental Quality Act (CEQA) process for the new water use objective requirements and has expressed concern that using the 55 gallons per capita per day (GPCD) number in the legislation will constitute "backsliding" and thus will need to be ratcheted down.
- **Water loss:** Per CWC § 10608.34.(i), "No earlier than January 1, 2019, and no later than July 1, 2020, the board shall adopt rules requiring urban retail water suppliers to meet performance standards for the volume of water losses. In adopting these rules, the board shall employ full life-cycle cost accounting to evaluate the costs of meeting the performance standards. The board may consider establishing a minimum allowable water loss threshold that, if reached and maintained by an urban water supplier, would exempt the urban water supplier from further water loss reduction requirements." The SWRCB is developing a complicated cost-benefit analysis methodology that would need to be conducted by retailers in order to determine what water loss controls are deemed cost-effective and thus required to be implemented. Water retailers, the Association of California Water Agencies, the California Municipal Utilities Association, and others are advocating for an alternative methodology. The implementation of these requirements has been delayed beyond the 1 July 2020 deadline.
- **CII:** Rather than developing a water volume-based standard for the CII sector, DWR was tasked with developing a set of performance standards through a workgroup process to increase water efficiency, per CWC § 10609.10, with adoption of these performance measures by 30 June 2022. Based on this process, DWR has determined that it is impossible to set such standards today, but retailers will be required to report on progress towards key actions related to potential future standards, such as conversion of mixed CII meters to dedicated irrigation meters, performance of water audits for CII accounts, development of water management plans for CII accounts, detailed classification of CII accounts by industry, etc. The specific actions that retailers will be required to report are not yet known.
- **Recycled Water Use:** In previous UWMPs, calculations of SB X7-7 baselines, targets, and gross water use for compliance were based only on potable water use, and thus the use of recycled water to offset potable water use was an effective method to help retailers conserve potable water and meet their SB X7-7 targets. However, under CWC § 10609.(b)(2)(F), the benefit of recycled water for compliance with annual water use objectives is much more limited: "Provides a bonus incentive for the amount of potable recycled water used the previous year when comparing the previous year's water use with the urban water use objective, of up to 10 percent of the urban water use objective." Thus, adoption and expansion of recycled water use only provides a compliance benefit if it constitutes direct potable reuse, indirect potable reuse, or reservoir augmentation (CWC § 10608.12.(o)).

2.2.2. Supply Reliability

- Retailers will be required to develop procedures to conduct annual water supply and demand assessments to determine its water supply reliability for the current year and one dry year and to conduct these assessments annually beginning in 2022 (CWC § 10632(a)(2)). These procedures are required to include the following (emphasis added):

  (A) The **written decision making process** that an urban water supplier will use each year to determine its water supply reliability.
  (B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

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

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

  (iii) Existing infrastructure capabilities and plausible constraints.

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

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

- In addition, the requirement to analyze supply reliability for a period of multiple consecutive drought years has been extended from a 3-year period to a 5-year period, per CWC §10631(f) and §10635(a). Specifically, retailers are now required to "compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years."

2.2.3. Water Shortage Contingency Plans

The new regulations also add new requirements related to drought planning and Water Shortage Contingency Plans (WSCPs):

- Retailers will now be required to conduct a drought risk assessment (DRA) as part of their UWMPs to assess water supply reliability (or vulnerability) for a period of drought lasting **five consecutive water years,**[2] starting from the year following that of the UWMP, and to compare water supplies (assessing each source of supply separately) with total projected water use (CWC § 10635(b)) during that period. The DRA five-year period for this 2020 UWMP is 2021-2025. During the 10 March 2020 workshop, DWR indicated that retailers will be expected to identify supply and demand on a monthly basis for this purpose, although it is noted that this does not appear to be an explicit requirement of the regulations.

[2] While the corresponding Water Supply Assessment (WSA) regulations have not been updated to require analysis of a five-year period, retailers should consider including a five-year drought period in their supply reliability assessment in any new WSAs.

- Per CWC § 10632.5 retailers' WSCPs "shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities" and a water supplier may submit "a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk."
- WSCPs will be required to use "Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage," or to provide a "cross-reference relating its existing categories to the six standard water shortage levels."

3. WATER USE CHARACTERISTICS

This section describes historical water use by customers within the District, including changes in use observed during and after the historic 2014 - 2016 drought, changes in average per account water use over time, and estimates of indoor and outdoor water use, based on data provided by the District. This information is used to provide context and background to support the projections of future demands (Section 4) and estimates of potential conservation program benefits (Section 6).

3.1. Historical Total and Per Capita Water Use

Table 3-1 summarizes the District's historical water use, service area population, and per capita water use for the years 2004 through 2019 (NMWD, 2020). Water use is described both in terms of total water produced and average per capita water use. It should be noted that the per capita water use for purposes of comparing water use to SB X7-7 water conservation targets may be different, due to the prescriptive method by DWR for determining a retailer's compliance population and total water use. SB X7-7 compliance will need to be separately addressed by the District's 2020 UWMP.

Total water use, including both potable and recycled water[3], ranged from 7,429 acre-feet per year (AFY) to 11,705 AFY over this period. Total per capita water use (i.e., including both potable and recycled water use) ranged from 108 GPCD to 183 GPCD. Potable water use ranged from 6,977 AFY to 11,705 AFY over this period. Per capita potable water use ranged from 101 GPCD to 183 GPCD.

Both the potable and per capita potable water use declined following 2008, corresponding with the economic downturn, and from 2013 through 2015, likely influenced by the historic drought conditions, mandatory state-wide restrictions in urban water use imposed by the SWRCB, and local drought response. Potable and per capita potable water use has remained lower than pre-drought conditions, with an increase from 2016 through 2019, indicating a degree of rebound following the drought.

Historical water use by customer sector is provided in **Table 3-2**. The single family residential (SFR) sector comprises the largest proportion of the District's total water use (i.e., 51% in 2019). By comparison, in 2019, dedicated irrigation accounts, including recycled water, collectively comprised 18% of total water use; the combined commercial and government sectors comprised 13% of total water use; and the combined multi-family residential (MFR) sectors (including apartment, townhouse/condo and mobile homes) comprised 13% of total water use. In 2019, non-revenue water was estimated to be 4.9% of the potable water demand based on the District's water loss audit data.[4]

3.2. Historical Average Water Use Per Account

The total number of accounts varies over time due to growth and development within the District and shifts in land use.

---

[3] The recycled water system is supplemented with potable water to meet demands, as necessary. Recycled water use discussed herein reflects all water served through the recycled water system.

[4] Given that non-revenue water data was unavailable for 2019, the average percent water loss from 2016-2018 DWR Water Loss Audit Reports was used, per DWR (2020).

The total number of accounts by customer sector for the 2004 to 2019 period is shown in **Table 3-3**, including a pie chart illustrating the relative proportion of accounts (NMWD, 2020). The SFR sector comprised the highest proportion of accounts in 2019 (72%), followed by the townhouse/condo sector (15%), commercial sector (3.9%), apartment sector (2.9%), and irrigation sector (1.7%). From 2010 to 2019, the SFR and apartment sectors had minimal net growth (0.74%) in the number of accounts. Government had a 5.3% net increase in accounts (from 94 accounts in 2010 to 99 accounts in 2019). Irrigation accounts (potable water) decreased by 17% over the same time period, largely due to the increase of recycled water accounts being used for irrigation, and commercial accounts decreased by 2.3%. Recycled water increased from one account in 2007 to 92 accounts in 2019.

Average water use per account is presented in **Table 3-4a**. For most sectors, per account water usage has followed the same general trends over time as total water use in the District (per **Table 3-1**). However, governmental water use has actually increased to pre-drought levels in 2018 and 2019.

Table 3-4b presents average water use for the residential sectors normalized by number of dwelling units. SFR accounts, on average, use approximately 80% to 200% more water per dwelling unit than apartment, townhouse/condo, and mobile home accounts. It should be noted that many larger MFR developments have dedicated irrigation meters.

3.3. Change in Residential Water Use Pre- and Post-Drought

Over time, customer water use becomes more efficient due to participation in conservation programs, passive savings,[5] and other behavioral or cultural changes. The more efficient customers become, the less opportunity there is for customers to save more water, which is referred to as "demand hardening." The SFR sector comprises the largest proportion of the District's total water use (approximately 51% in 2019). Therefore, in order to observe demand hardening over time, histograms illustrating the distribution of water use by SFR customers for three separate years (2004, 2013, and 2019) are shown in **Figure 3-1.**

The median SFR account water use has shifted from 369 GPD to 303 GPD between 2004 and 2013, reflecting a 22% reduction in water use. Following the drought, water use was reduced even further with a median of 235 GPD in 2019, reflecting a 29% reduction from 2013 water use. In 2004, the middle 50% of accounts used 254 GPD to 510 GPD. In 2019, this range has shrunk considerably, with the middle 50% of accounts using between 151 GPD and 345 GPD. Based on this (and taken with the **Table 3-5** results discussed below), it appears that a high degree of customer savings/increased efficiency has occurred, which are expected to be a combination of both passive and active savings, as well as effects of the drought. Water savings achieved during drought conditions are typically driven by behavioral changes, rather than device changeouts (AWE, 2015). Given the limited rebound observed since the drought (**Table 3-4a**), it may be that behavioral changes during the drought have resulted in permanent changes in customers' water use.

[5] Passive savings refers to the water savings associated with the natural replacement of older toilets, showerheads, clothes washers, and other water using appliances with newer high efficiency devices that are available due to both market shifts and increasing efficiency mandated by the building code and other regulatory requirements.

3.4. Residential Water Use by Dwelling Unit and Age of Construction

It is commonly assumed that new residential construction is inherently more water efficient than older construction due to changes in plumbing codes and the increased efficiency of water using devices available on the market today. However, in some areas it has been observed that newer construction can actually have higher rates of water use, which is an important consideration when evaluating future water demands associated with new development. In order to evaluate water use relative to the age of residential construction within the District, water use by SFR and MFR accounts is summarized in **Table 3-5** by units constructed: (1) prior to 1994, (2) from 1994 through 2009, and (3) 2010 and later.

Water use by new (2010 and later) SFR units appears to be generally consistent with 1994-2009 units through 2015, but used up to 9% less water than 1994-2009 units by 2019, on a per dwelling unit basis. Water use by 1994-2009 SFR units is on average about 30% higher than pre-1994 units on a per dwelling unit basis. Given this, as discussed in Section 4.3.1, a water demand factor representative of newer construction (1994 and later) is used as the basis for demand projections for new SFR accounts.

For MFR units, there appears to be less difference in water use between pre-1994 units and newer units than observed in SFR units. Newer (post 1994) MFR units appear to use roughly 5% less water than older units on a per dwelling unit basis. It should be noted that some of the effect observed could be due to increasing household size, with multiple families sometimes sharing one apartment. Given this, the demand projections for new MFR accounts discussed in Section 4.3.1 are conservatively based on all MFR units regardless of construction age.

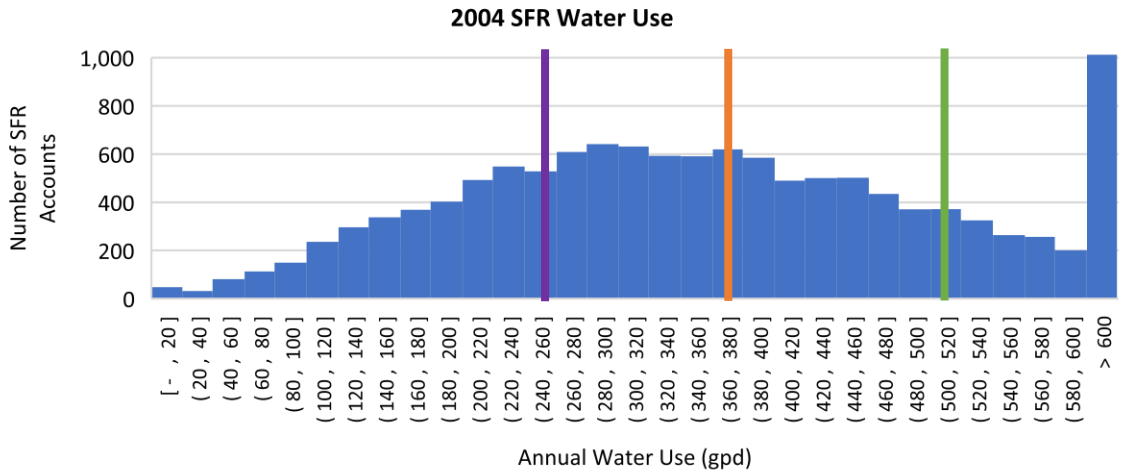
3.5. Estimated Indoor and Outdoor Water Use

When designing and estimating the benefits of potential water conservation programs, it is important to understand the relative proportion of water use that is used indoors versus outdoors.

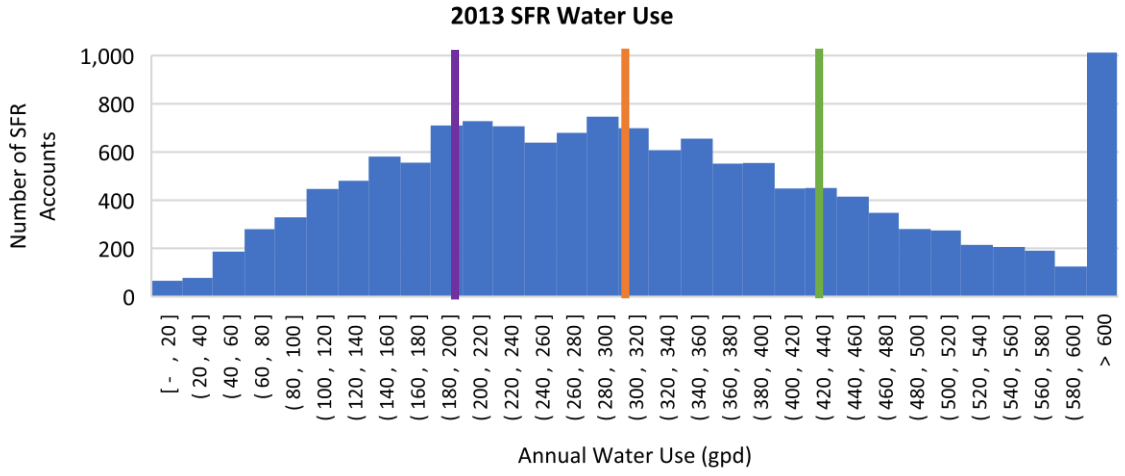
As shown in the first chart in **Table 3-6**, potable water use within the District varies seasonally, and water use in the summer is two to three times greater than water use during the winter. This seasonality is typically driven by increased irrigation needs in the summer, as compared to the more limited irrigation water use during the wetter and cooler winter months. The second chart in **Table 3-6** shows the seasonality of recycled water use, which is limited to use for irrigation. Based on the recycled water use patterns, irrigation rates appear to be nearly zero during winter months, confirming that it is reasonable and conservative to assume that minimal irrigation with potable water occurs during winter months. It is noted that this is a high-level estimate of indoor and outdoor water use, which errs on the side of estimating higher indoor water use.

Given the water use patterns presented in **Table 3-6**, the minimum average daily water use during winter months (November – April due to bi-monthly billing data) was used to estimate the indoor water use for all non-irrigation customer sectors. From this, outdoor water use was calculated as the difference between indoor water use and total water use for each potable water use sector. The results of this estimate are shown in **Table 3-7**. Approximately 53% of all potable water use within the District is estimated to be indoor use, and 47% to be outdoor water use. Total water use (including recycled water) is approximately 50% indoor water use and 50% outdoor use.

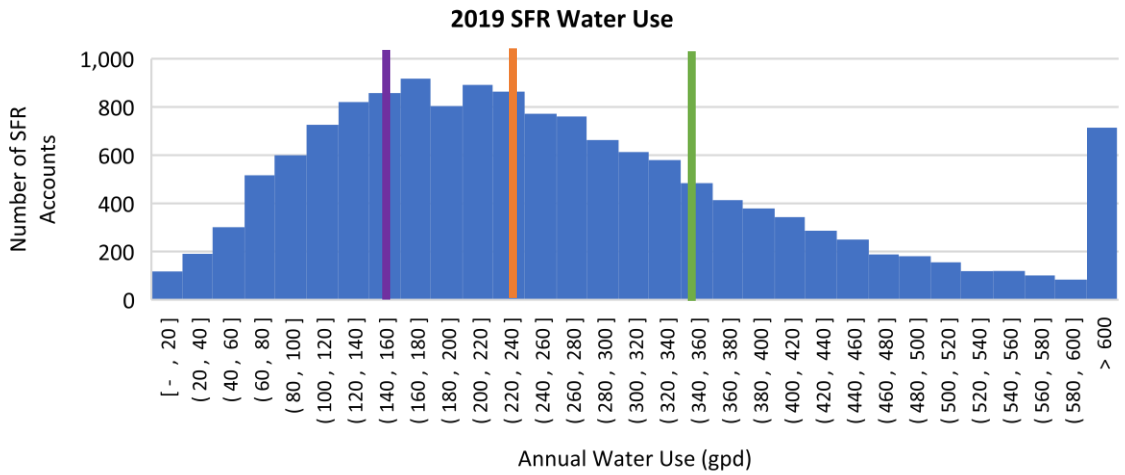
Aside from the dedicated “pool”, “other”, irrigation, and recycled water sectors (presumed 100% outdoor water use), the governmental sector is estimated to have the highest proportion of outdoor water use at 76%, followed by SFR at 46%, mobile homes at 31%, and commercial at 26%. The apartment sector has an estimated 13% outdoor water use and townhouse/condo sector has an estimated 9.0% water use. It should be noted that landscape areas for larger multi-family developments tend to have dedicated irrigation accounts. Further, some industries within the CII sector, such as restaurants and manufacturing, may also experience some degree of seasonality in indoor use, with increased business and production during summer months. Thus, these should be considered high-level estimates of indoor and outdoor use proportions.



Count	13,892
Average	435 gpd
25th Percentile	254 gpd
Median	369 gpd
75th Percentile	510 gpd



Count	14,678
Average	352 gpd
25th Percentile	199 gpd
Median	303 gpd
75th Percentile	430 gpd



Count	14,819
Average	274 gpd
25th Percentile	151 gpd
Median	235 gpd
75th Percentile	345 gpd

Abbreviations
gpd = gallons per day
SFR = single-family residential

Notes
1. Charts represent histograms (distribution) of SFR water use for three selected years. Data included in chart are limited to SFR accounts that received at least six water bills in the specified year.

Legend
- = 25th Percentile (25% of data are lower than this value)
- = Median (50% of data are lower than this value)
- = 75th Percentile (75% of data are lower than this value)

SFR Water Use over Time

North Marin Water District
Sonoma-Marin Saving Water Partnership
December 2020
C00004.00

Figure 3-1

Table 3-1
Water Use and Population
North Marin Water District, Sonoma-Marin Saving Water Partnership

Year (a)	Potable Water Use (AFY) (b)	Potable Non-Revenue Water (AFY) (c) (d)	Recycled Water Use (AFY) (e)	Total Water Use (AFY)	Service Area Population (f)	Per Capita Potable Water Use (GPCD) (g)	Per Capita Total Water Use (GPCD) (g)
2004	11,233	473	--	11,705	57,180	183	183
2005	10,210	-254	--	9,955	57,848	154	154
2006	10,604	738	--	11,342	58,363	173	173
2007	10,214	324	160	10,698	58,878	160	162
2008	10,505	588	242	11,335	59,393	167	170
2009	9,273	-114	214	9,373	59,908	136	140
2010	8,479	-231	159	8,407	59,861	123	125
2011	8,275	519	159	8,952	60,119	130	133
2012	9,083	796	184	10,063	60,377	146	149
2013	9,398	670	420	10,489	60,635	148	154
2014	8,064	279	453	8,796	60,893	122	129
2015	6,923	54	452	7,429	61,381	101	108
2016	7,085	242	415	7,743	61,386	106	113
2017	7,666	193	458	8,317	61,470	114	121
2018	7,774	124	592	8,491	61,616	114	123
2019	7,864	407	578	8,849	61,637	120	128

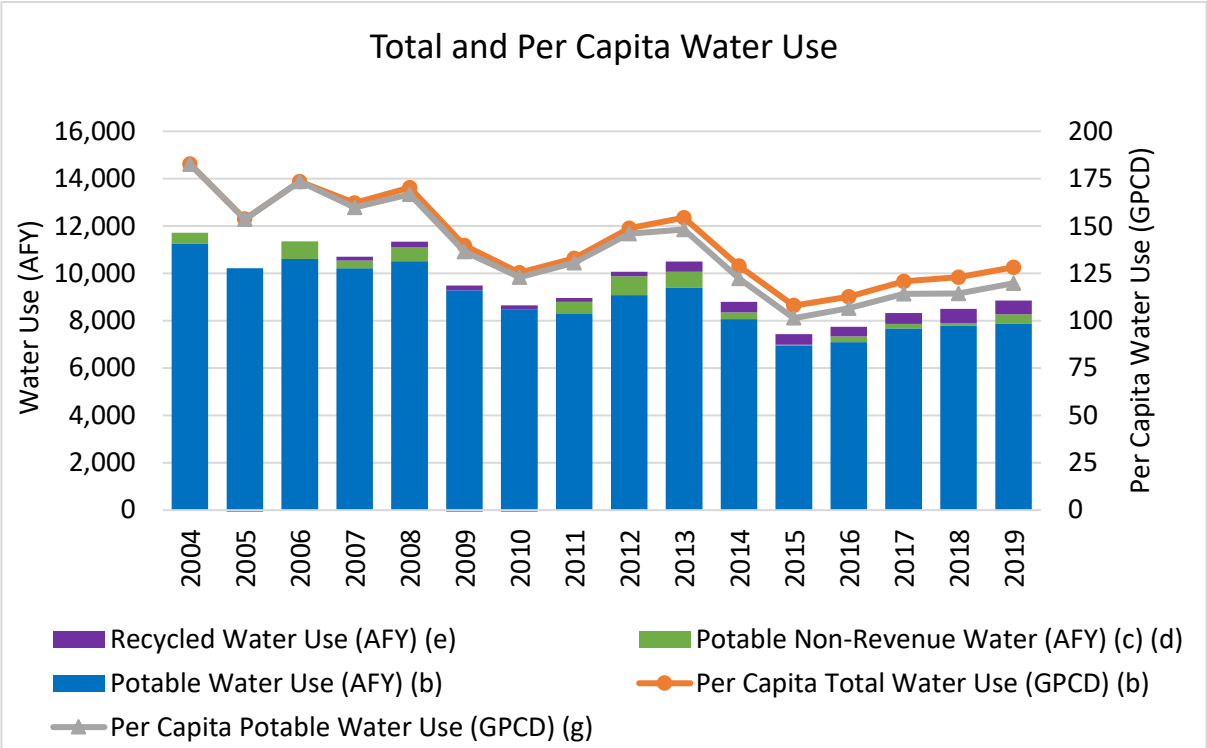


Table 3-1
Water Use and Population
North Marin Water District, Sonoma-Marin Saving Water Partnership

Abbreviations:

-- = not available
GPCD = gallons per capita per day
AFY = acre-feet per year

Notes:

(a) Data are presented on a calendar year basis.
(b) Water use data per Reference 2. Potable water totals include a small percentage (roughly 2%) of raw water delivered to irrigation customers.
(c) Estimated non-revenue water per Table 3-2.
(d) Estimates of non-revenue water are based on the potable water system and include both real and apparent losses. The recycled water system would be expected to have a degree of water loss, but this loss has not been quantified.
(e) Recycled water use data per Reference 2. The recycled water system is supplemented with potable water to meet demands, as necessary. Recycled water use shown here reflects all water served through the recycled water system.
(f) Population data for 2015 per Reference 1 and all other years per Reference 3.
(g) Per capita water use is calculated by dividing the annual water use by service area population and the number of days in a year.

References:

1. North Marin Water District, 2016. 2015 Urban Water Management Plan, prepared by North Marin Water District, dated June 2016.
2. North Marin Water District, 2020a. Billing history data: 2010-2019 MonthlyWaterByService2004_2019.xlsx, provided by North Marin Water District on 13 April 2020.
3. North Marin Water District, 2020b. NMWD Historical Population.xlsx, provided by North Marin Water District on 6 April 2020.

Table 3-2
Water Use by Customer Sector
North Marin Water District, Sonoma-Marin Saving Water Partnership

Water Use Sector	Water Use (AFY) (a) (b)															
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Single Family Residential	6,868	6,231	6,418	6,280	6,381	5,666	5,126	4,995	5,528	5,810	4,883	4,090	4,232	4,631	4,677	4,553
Apartment	687	663	673	683	685	666	648	653	650	659	615	566	559	555	577	572
Townhouse/Condo	538	548	565	555	548	546	513	517	526	541	496	455	453	462	459	458
Mobile Home	120	116	113	118	114	105	102	99	103	107	90	83	83	89	88	95
Commercial (c)	1,225	1,178	1,191	1,089	1,085	986	919	896	960	921	857	797	801	853	871	844
Government	291	227	246	251	287	252	233	201	230	271	233	184	174	193	300	269
Irrigation	1,330	1,123	1,284	1,117	1,272	960	850	811	981	965	782	678	712	796	716	987
Pool	94	87	86	91	88	75	72	76	81	84	74	61	65	71	68	71
Other (d)	79	36	27	28	45	16	15	26	24	41	33	9	6	15	17	16
Recycled Water (e)	--	--	--	160	242	214	159	159	184	420	453	452	415	458	592	578
Total Water Consumption	**11,233**	**10,210**	**10,604**	**10,374**	**10,747**	**9,487**	**8,638**	**8,433**	**9,267**	**9,819**	**8,517**	**7,375**	**7,501**	**8,124**	**8,366**	**8,442**
Non-revenue Water (f) (g)	4.0%	-2.6%	6.5%	3.1%	5.3%	-1.2%	-2.8%	5.9%	8.1%	6.7%	3.3%	0.77%	3.3%	2.5%	1.6%	4.9%
	473	-254	738	324	588	-114	-231	519	796	670	279	54	242	193	124	407
Total Water Use	**11,705**	**9,955**	**11,342**	**10,698**	**11,335**	**9,373**	**8,407**	**8,952**	**10,063**	**10,489**	**8,796**	**7,429**	**7,743**	**8,317**	**8,491**	**8,849**

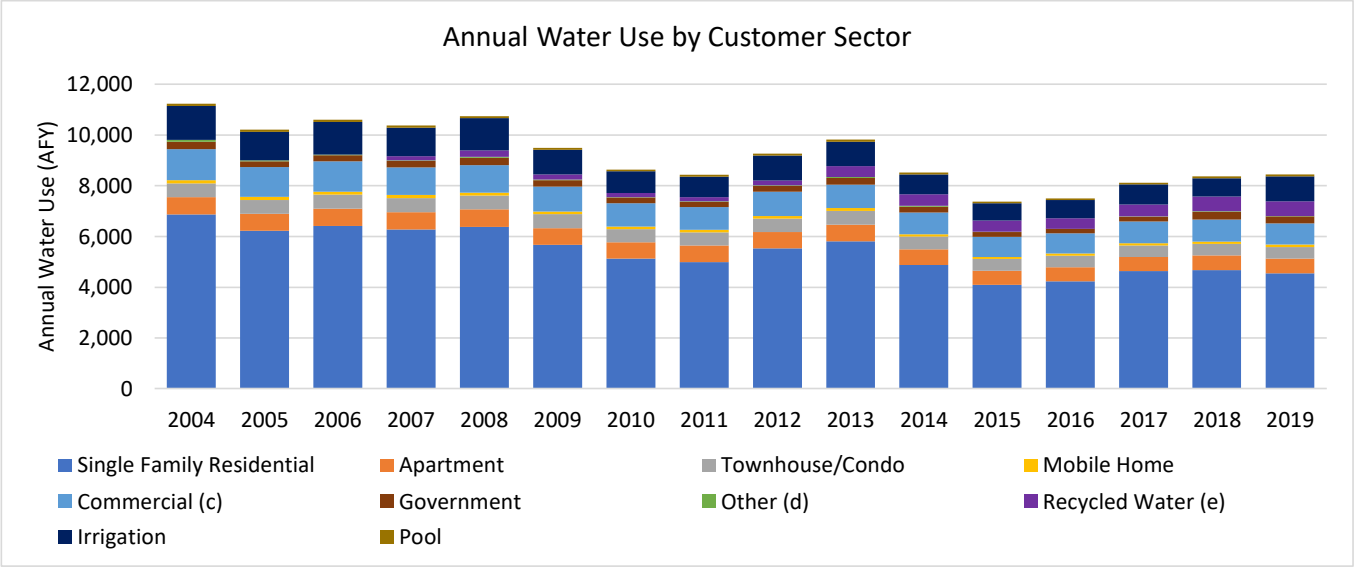


Table 3-2

Water Use by Customer Sector

North Marin Water District, Sonoma-Marin Saving Water Partnership

Abbreviations:

-- = not available

AFY = acre-feet per year

Notes:

(a) Data are presented on a calendar year basis.

(b) Water use by sector per Reference 2.

(c) Commercial includes combined commercial/residential accounts.

(d) Other includes livestock, hydrants, other fire services.

(e) The recycled water system is supplemented with potable water to meet demands, as necessary. Recycled water use shown here reflects all water served through the recycled water system.

(f) Non-revenue water for 2004-2018 per Reference 3. For 2019 where non-revenue water data was unavailable, the average percent water loss from 2016-2018 DWR Water Loss Audit Reports was used, per Reference 1. Non-revenue water for years 2004-2017 are calculated on a fiscal year basis, and the actual water loss in the calendar year shown here are likely to be slightly different.

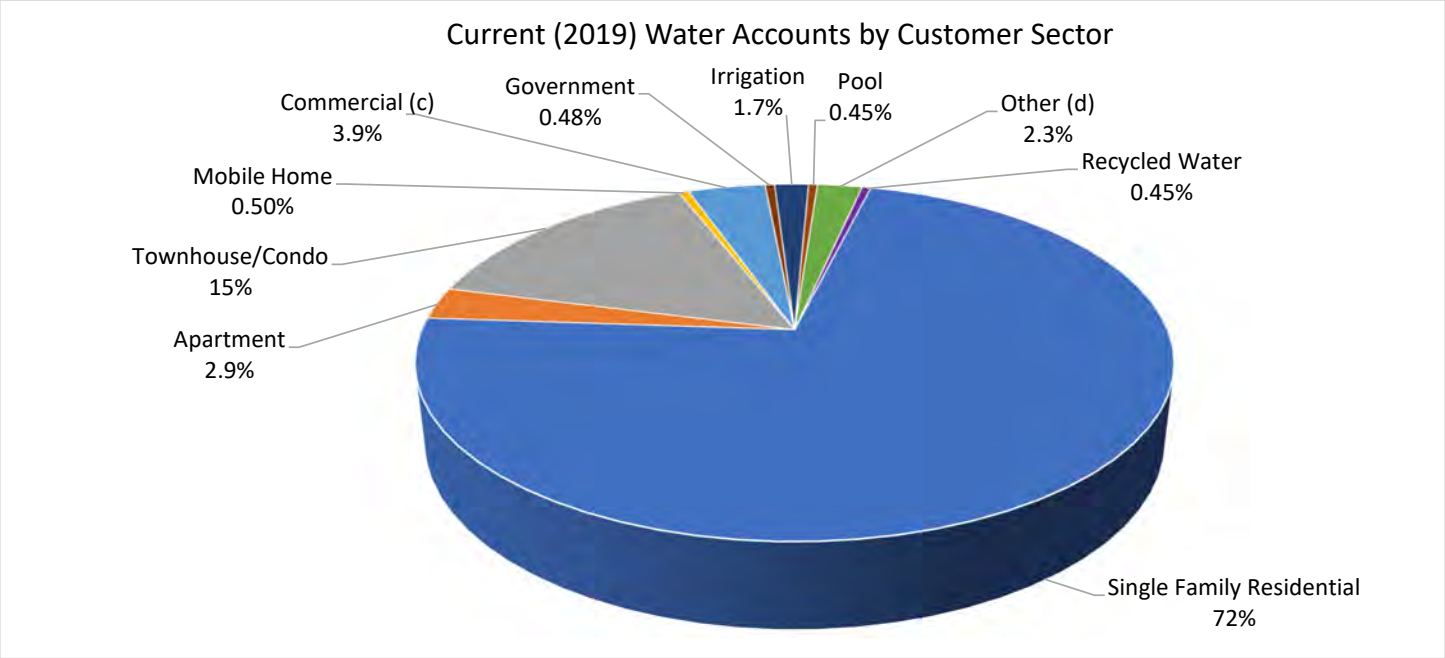
(g) Estimates of non-revenue water are based on the potable water system and include both real and apparent losses. The recycled water systems would be expected to have a degree of water loss, but this loss has not been quantified.

References:

1. DWR, 2020. WUEdata - Water Audit Report Data website, accessed 13 June 2020, (https://wuedata.water.ca.gov/awwa_plans).
2. North Marin Water District, 2020a. Billing history data: 2010-2019 MonthlyWaterByService2004_2019.xlsx, provided by North Marin Water District on 13 April 2020.
3. North Marin Water District, 2020b. NMWD Copy of WTRLOSS% - dladd2018.xlsx, provided by North Marin Water District on 15 April 2020.

Table 3-3
Number of Accounts by Customer Sector
North Marin Water District, Sonoma-Marin Saving Water Partnership

Water Use Sector	Number of Accounts (a) (b)															
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Single Family Residential	14,206	14,571	14,661	14,714	14,723	14,746	14,754	14,769	14,779	14,789	14,811	14,821	14,825	14,849	14,856	14,863
Apartment	562	572	587	589	588	588	589	588	589	588	588	589	589	591	593	593
Townhouse/Condo	2,745	2,952	3,112	3,111	3,110	3,111	3,112	3,112	3,114	3,113	3,115	3,113	3,114	3,113	3,114	3,111
Mobile Home	103	103	103	103	103	103	102	102	102	103	103	103	102	102	102	102
Commercial (c)	810	806	815	815	826	822	829	825	821	821	818	811	818	811	810	810
Government	91	91	92	92	92	94	94	95	97	101	99	100	100	100	100	99
Irrigation	350	377	403	405	415	422	431	444	428	421	407	406	412	397	400	356
Pool	92	91	91	91	91	91	91	94	93	93	93	93	93	93	93	92
Other (d)	368	389	409	412	428	420	428	425	435	440	434	428	435	450	462	469
Recycled Water	--	--	--	1	1	3	4	3	6	44	44	44	46	53	92	92
Total Accounts	**19,327**	**19,952**	**20,273**	**20,333**	**20,377**	**20,400**	**20,434**	**20,457**	**20,464**	**20,513**	**20,512**	**20,508**	**20,534**	**20,559**	**20,622**	**20,587**



Abbreviations:
-- = not available

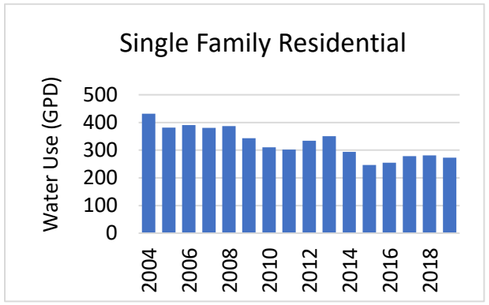
Table 3-3
Number of Accounts by Customer Sector
North Marin Water District, Sonoma-Marin Saving Water Partnership

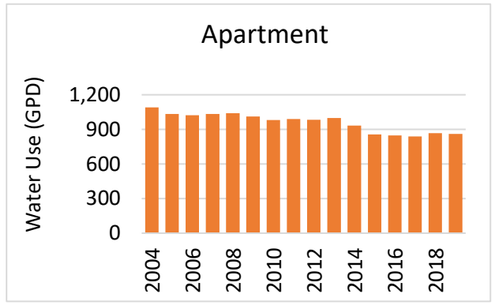
Notes:
(a) Data are presented on a calendar year basis.
(b) Number of accounts by sector per Reference 1.
(c) Commercial includes combined commercial/residential accounts.
(d) Other includes livestock, hydrants, other fire services.

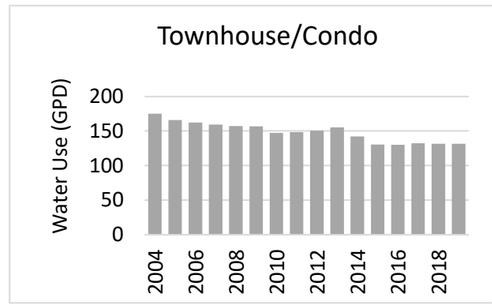
References:
1. North Marin Water District, 2020. Billing history data: 2010-2019 MonthlyWaterByService2004_2019.xlsx, provided by North Marin Water District on 13 April 2020.

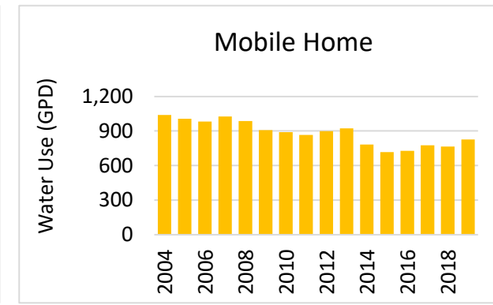
Table 3-4a
Per Account Water Use by Customer Sector
North Marin Water District, Sonoma-Marin Saving Water Partnership

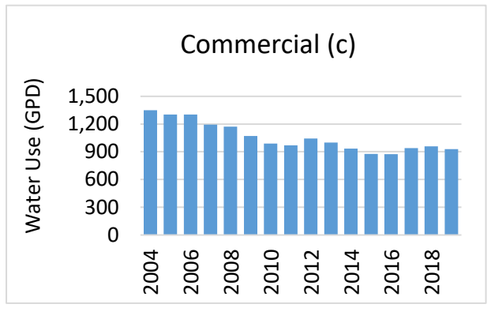
Water Use Sector	Water Use per Account (GPD) (a) (b)															
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Single Family Residential	431	382	391	381	387	343	310	302	334	351	294	246	255	278	281	273
Apartment	1,091	1,035	1,023	1,034	1,040	1,011	982	990	984	999	933	857	847	838	868	860
Townhouse/Condo	175	166	162	159	157	157	147	148	151	155	142	130	130	132	132	131
Mobile Home	1,039	1,006	982	1,025	985	908	889	866	898	923	782	717	727	775	765	827
Commercial (c)	1,349	1,304	1,304	1,192	1,172	1,070	989	969	1,043	1,000	935	877	874	938	959	929
Government	2,857	2,221	2,383	2,438	2,786	2,392	2,215	1,892	2,116	2,397	2,104	1,643	1,548	1,726	2,680	2,427
Irrigation	3,389	2,658	2,843	2,461	2,735	2,030	1,760	1,630	2,046	2,045	1,714	1,490	1,541	1,789	1,598	2,473
Pool	913	857	847	891	859	737	707	726	776	802	712	584	627	680	653	684
Other (d)	192	83	59	61	93	34	32	54	49	82	67	19	13	31	32	30
Recycled Water	--	--	--	142,479	215,700	63,598	35,433	47,177	27,362	8,525	9,182	9,164	8,058	7,709	5,743	5,600

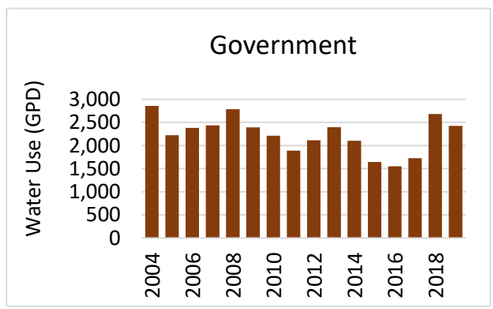


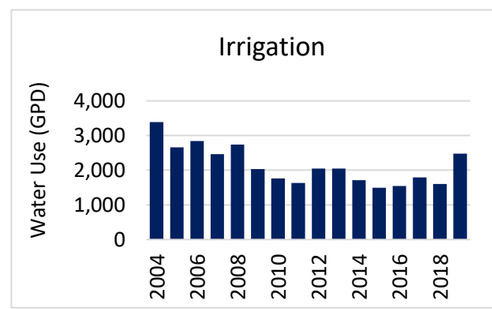


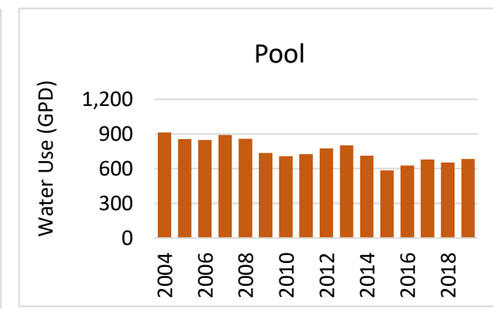


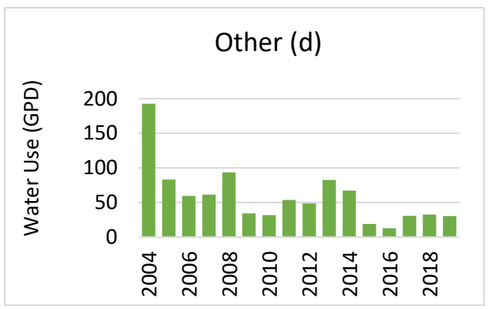












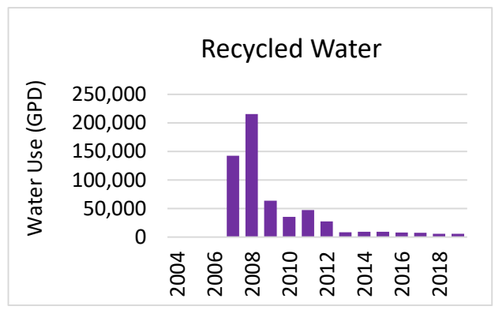


Table 3-4a

Per Account Water Use by Customer Sector

North Marin Water District, Sonoma-Marin Saving Water Partnership

Abbreviations:

-- = not available

GPD = gallons per day

Notes:

(a) Data are presented on a calendar year basis.

(b) Water use and number of accounts by sector per Tables 3-2 and 3-3.

(c) Commercial includes combined commercial/residential accounts.

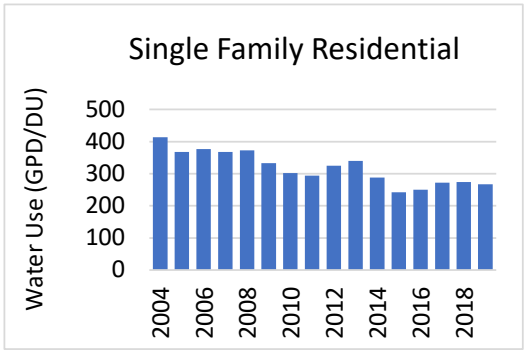
(d) Other includes livestock, hydrants, other fire services.

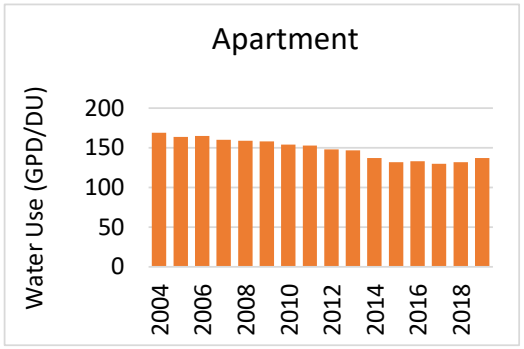
References:

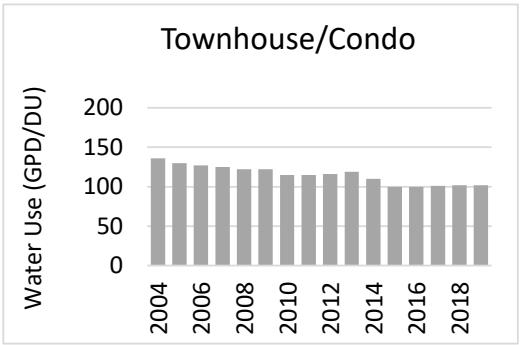
1. North Marin Water District, 2020. Billing history data: 2010-2019 MonthlyWaterByService2004_2019.xlsx, provided by North Marin Water District on 13 April 2020.

Table 3-4b
Per Dwelling Unit Water Use for Residential Sectors
North Marin Water District, Sonoma-Marin Saving Water Partnership

Water Use Sector	Water Use per Dwelling Unit (GPD/DU) (a) (b)															
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Single Family Residential	414	368	377	368	373	333	302	294	325	340	288	242	250	272	274	267
Apartment	169	164	165	160	159	158	154	153	148	147	137	132	133	130	132	137
Townhouse/Condo	136	130	127	125	122	122	115	115	116	119	110	100	100	101	102	102
Mobile Home	148	138	134	146	137	138	133	139	144	135	129	124	122	125	114	113







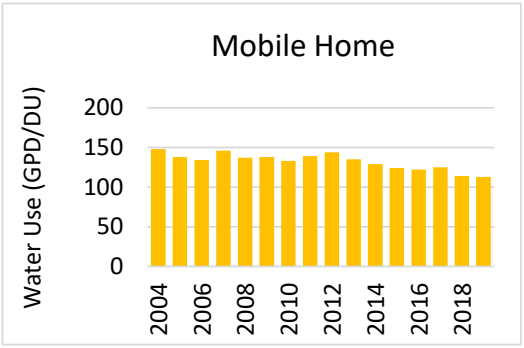


Table 3-4b

Per Dwelling Unit Water Use for Residential Sectors

North Marin Water District, Sonoma-Marin Saving Water Partnership

Abbreviations:

-- = not available

DU = dwelling unit

GPD = gallons per day

Notes:

(a) Data are presented on a calendar year basis.

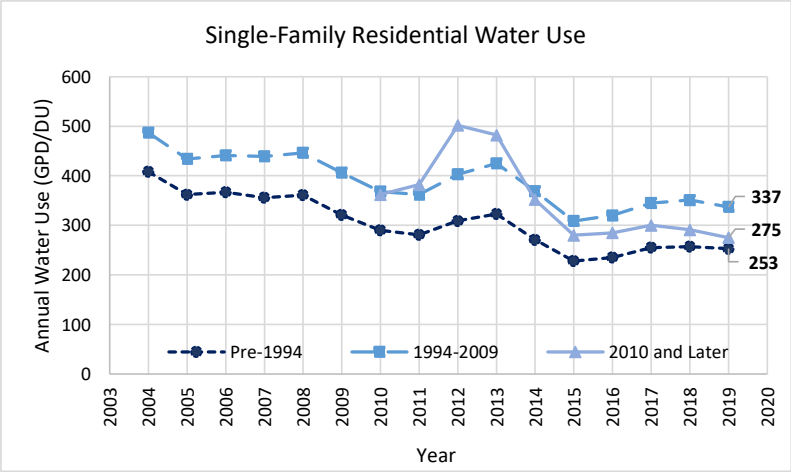
(b) Per dwelling unit water use is calculated based on the number of residential dwelling units per account provided in customer billing data.

References:

1. North Marin Water District, 2020. Billing history data: 2010-2019 MonthlyWaterByService2004_2019.xlsx, provided by North Marin Water District on 13 April 2020.

Table 3-5
Residential Water Use by Age of Construction
North Marin Water District, Sonoma-Marin Saving Water Partnership

Construction Age	Average Water Use (GPD per Dwelling Unit) (a) (b)																Number of Accounts, 2019
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
Single Family Residential																	
Pre-1994	408	362	367	356	361	321	290	281	309	323	271	228	235	255	257	253	10,188
1994-2009	487	434	441	439	446	406	368	362	403	425	369	309	320	345	351	337	2,530
2010 and Later	--	--	--	--	--	--	362	382	502	482	352	280	285	300	291	275	112
Multi-Family Residential (Inclusive of Apartments, Townhouse/Condo, and Mobile Homes)																	
Pre-1994	145	137	137	131	130	128	122	122	121	122	112	103	104	105	107	108	2,093
1994-2009	145	126	123	115	114	117	112	111	115	119	113	100	98	99	96	97	536
2010 and Later	--	--	--	--	--	--	110	130	103	114	79	56	94	105	90	96	2
Apartment																	
Pre-1994	186	183	185	173	175	176	172	171	163	163	150	146	153	144	148	157	286
1994-2009	265	228	312	225	267	205	195	174	175	214	153	139	138	194	190	232	1
2010 and Later	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Townhouse/Condo																	
Pre-1994	139	130	130	125	123	120	114	113	115	116	106	96	96	98	100	100	1,807
1994-2009	144	125	123	115	114	117	112	111	115	119	113	100	98	98	96	96	535
2010 and Later	--	--	--	--	--	--	110	130	103	114	79	56	94	105	90	96	2
Mobile Home																	
Pre-1994	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1994-2009	140	137	130	142	131	133	136	139	143	133	129	129	122	128	111	106	80
2010 and Later	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



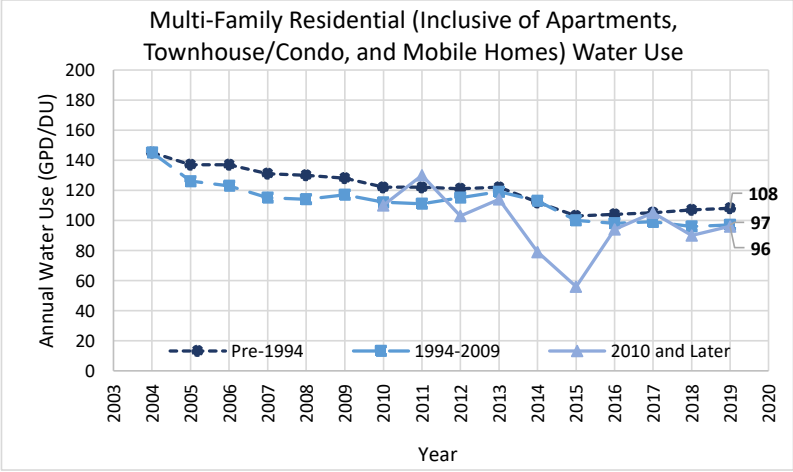
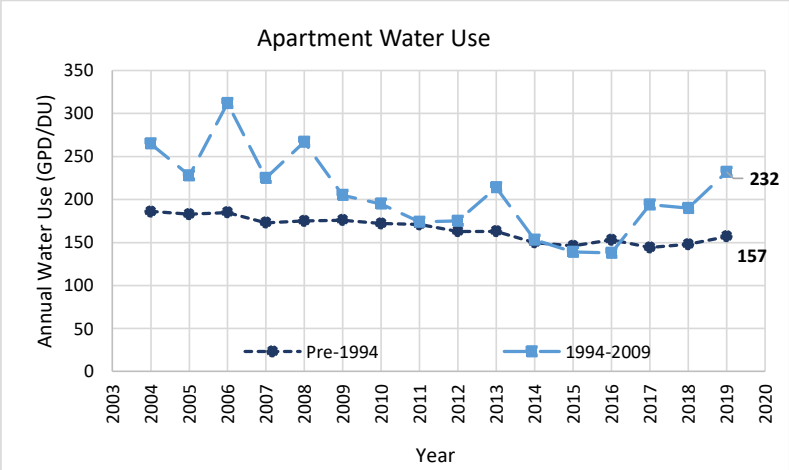
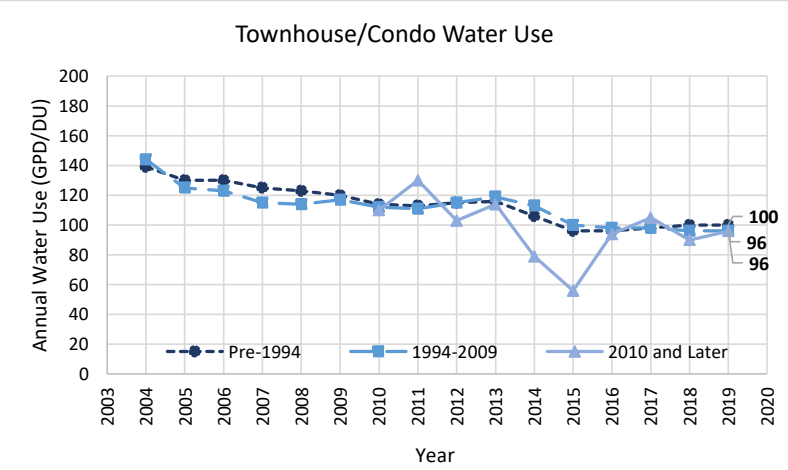


Table 3-5
Residential Water Use by Age of Construction
North Marin Water District, Sonoma-Marin Saving Water Partnership





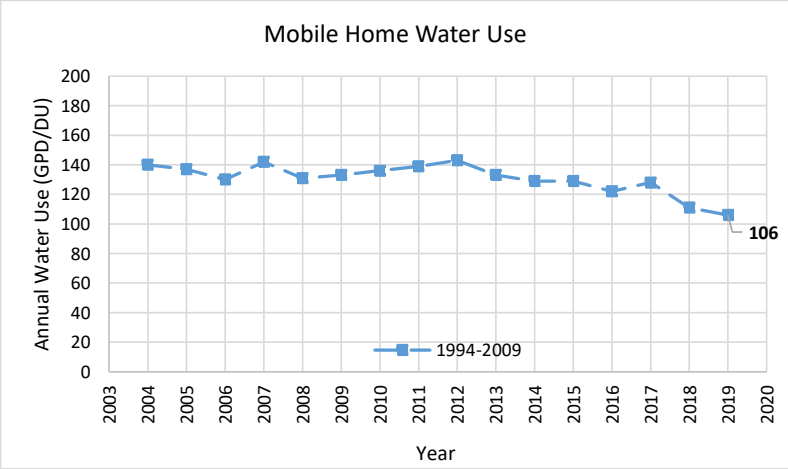


Table 3-5
Residential Water Use by Age of Construction
North Marin Water District, Sonoma-Marin Saving Water Partnership

Abbreviations:
-- = not available
AFY = acre-feet per year
GPD = gallons per day
DU = dwelling unit

Notes:
(a) Data are presented on a calendar year basis.
(b) Average water use per dwelling unit is shown for residential sectors based on billing data, per Reference 2. Accounts included in this analysis are limited to that for which construction year is available, based on Marin County Assessor data, and that received 6 bills in the specified year per Reference 1.

References:
1. Marin County, 2020. County Wide Parcel Data ConservationJan2020.gdb, provided by Marin Municipal Water District on 13 February 2020.
2. North Marin Water District, 2020. 2010-2019 MonthlyWaterByService2004_2019RawData.xlsx, provided by North Marin Water District on 14 May 2020.

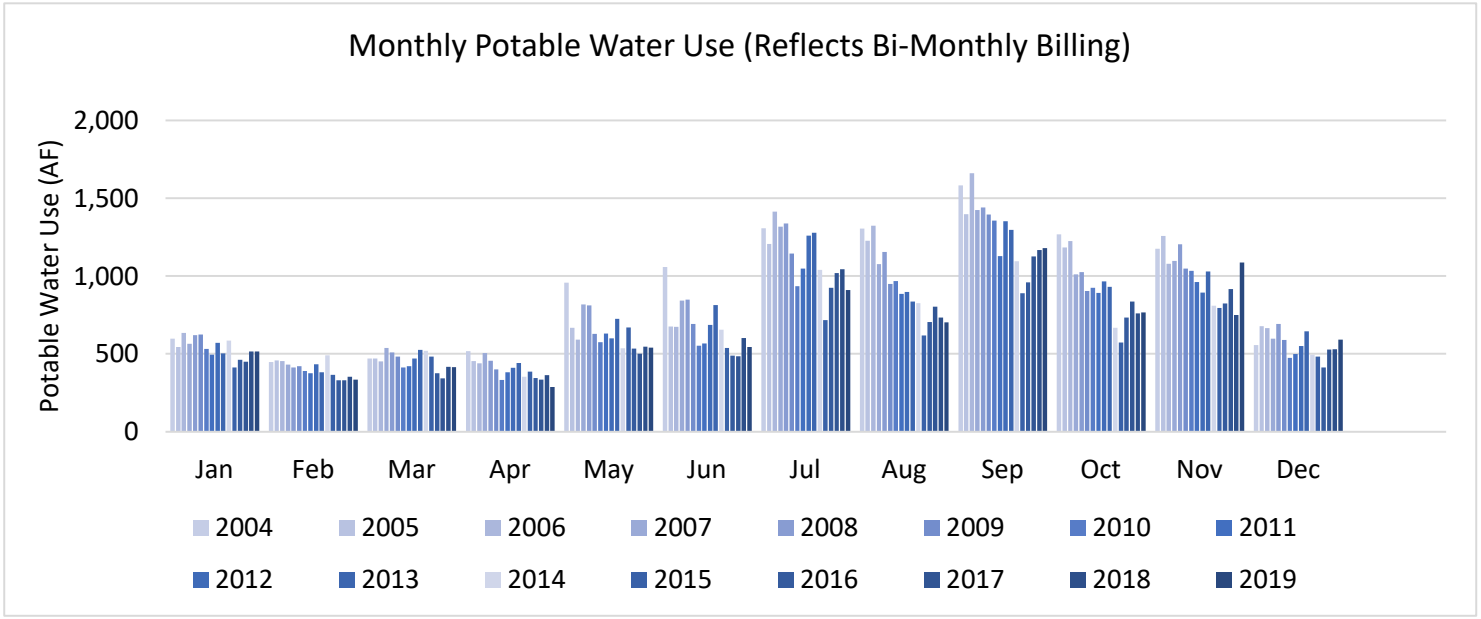
Table 3-6

Monthly Water Use

North Marin Water District, Sonoma-Marin Saving Water Partnership

Month	Monthly Water Use (AF) (a)															
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Potable Water Use																
January	597	544	633	564	620	624	532	494	571	502	584	412	461	450	515	514
February	447	457	453	430	411	421	389	375	432	381	491	366	329	330	352	334
March	469	469	452	537	508	481	413	419	470	525	519	481	375	342	417	414
April	516	453	439	504	456	400	332	381	410	441	352	386	345	335	363	286
May	957	666	592	817	810	629	575	630	599	724	535	669	533	500	546	539
June	1,057	675	672	841	848	692	552	566	686	812	655	538	489	483	602	543
July	1,306	1,206	1,412	1,316	1,338	1,143	934	1,047	1,259	1,278	1,040	715	923	1,018	1,042	909
August	1,305	1,227	1,322	1,077	1,154	949	967	885	898	835	826	617	704	803	733	701
September	1,582	1,397	1,661	1,423	1,439	1,395	1,355	1,128	1,352	1,297	1,094	890	958	1,126	1,166	1,179
October	1,267	1,183	1,225	1,011	1,025	904	923	891	964	930	667	572	733	836	759	766
November	1,174	1,256	1,079	1,096	1,203	1,046	1,032	960	892	1,028	809	794	823	916	750	1,087
December	556	678	665	598	692	590	473	498	549	645	493	483	412	527	530	592
Recycled Water Use																
January	--	--	--	--	0	0	0	0.092	0.38	1.5	3.3	4.4	4.5	3.8	3.7	14
February	--	--	--	--	0	0	0	0	0	0.42	15	1.8	0.46	0.71	0.49	2.5
March	--	--	--	--	0	0	0	0.27	0.15	0.86	10	4.3	1.9	-0.63	4.5	1.6
April	--	--	--	--	0.083	0	0	0	0	13	3.7	19	1.3	1.8	5.5	1.9
May	--	--	--	--	0	0	0.24	0.15	0.23	8.2	14	23	20	14	15	19
June	--	--	--	--	63	60	21	37	45	67	68	85	59	50	67	57
July	--	--	--	--	0	0	0.34	0.45	1.1	26	50	35	44	47	72	80
August	--	--	--	75	83	73	68	55	62	77	100	88	101	109	116	105
September	--	--	--	0	0	0	0.40	0.057	0.56	60	50	43	41	53	84	90
October	--	--	--	75	74	70	63	65	67	88	83	86	97	108	112	89
November	--	--	--	0	0	0	0.44	0.23	0.47	43	29	31	32	34	78	70
December	--	--	--	10	21	10	5.3	0	8.1	34	26	32	14	37	35	47

Table 3-6
Monthly Water Use
North Marin Water District, Sonoma-Marin Saving Water Partnership



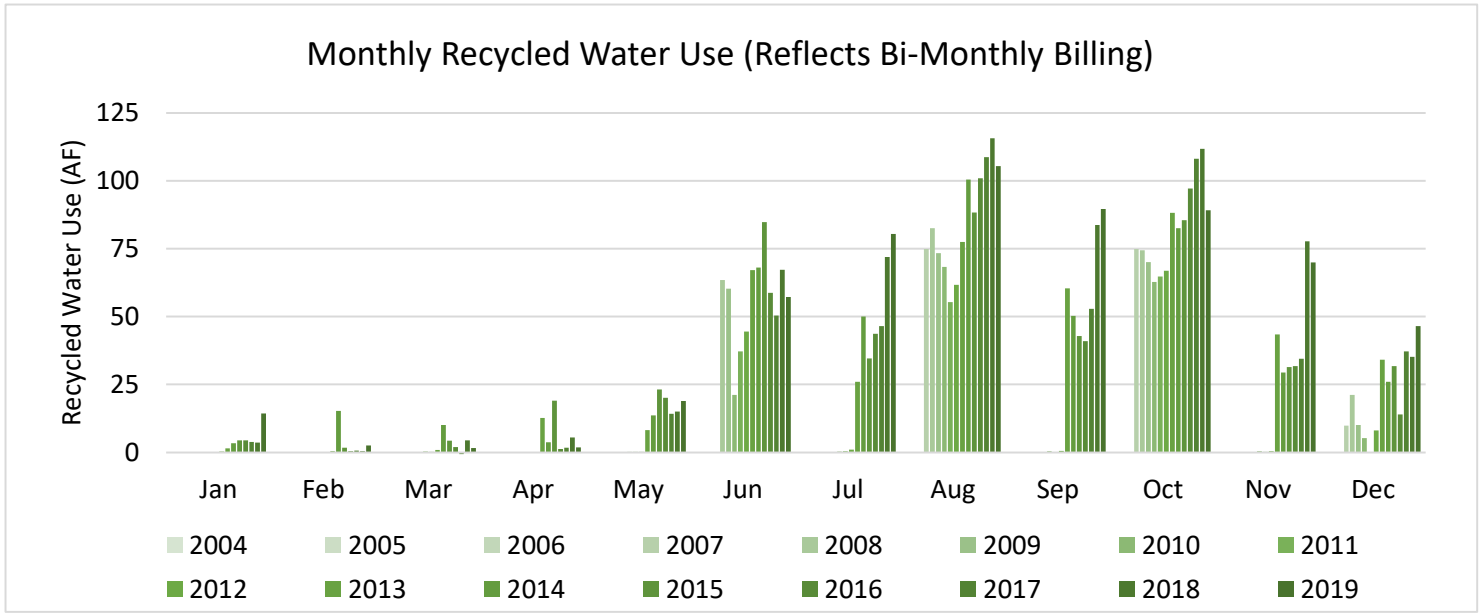


Table 3-6

Monthly Water Use

North Marin Water District, Sonoma-Marin Saving Water Partnership

Abbreviations:

-- = not available

AF = acre-feet

Notes:

(a) Monthly potable and recycled water use per Reference 1. Customers are billed on a bimonthy basis. Data are shown without adjustment.

References:

1. North Marin Water District, 2020. Billing history data: 2010-2019 MonthlyWaterByService2004_2019.xlsx, provided by North Marin Water District on 13 April 2020.

Table 3-7
Estimated Indoor and Outdoor Water Use
North Marin Water District, Sonoma-Marin Saving Water Partnership

Water Use Sector	2017				2018				2019				Average Pct.	
	Indoor Water Use (AFY)	Outdoor Water Use (AFY)	Pct. Indoor	Pct. Outdoor	Indoor Water Use (AFY)	Outdoor Water Use (AFY)	Pct. Indoor	Pct. Outdoor	Indoor Water Use (AFY)	Outdoor Water Use (AFY)	Pct. Indoor	Pct. Outdoor	Indoor Use	Outdoor Use
Single Family Residential	2,339	2,293	50%	50%	2,787	1,890	60%	40%	2,318	2,236	51%	49%	54%	46%
Apartment	486	69	88%	12%	484	93	84%	16%	514	57	90%	10%	87%	13%
Townhouse/Condo	406	56	88%	12%	411	48	90%	10%	438	20	96%	4%	91%	9%
Mobile Home	57	32	64%	36%	62	26	70%	30%	67	27	71%	29%	69%	31%
Commercial	609	244	71%	29%	656	215	75%	25%	646	198	77%	23%	74%	26%
Government	52	142	27%	73%	60	241	20%	80%	67	203	25%	75%	24%	76%
Irrigation	0	796	0%	100%	0	716	0%	100%	0	987	0%	100%	0%	100%
Pool	0	71	0%	100%	0	68	0%	100%	0	71	0%	100%	0%	100%
Other	0	15	0%	100%	0	17	0%	100%	0	16	0%	100%	0%	100%
Total (Potable)	**3,948**	**3,718**	**51%**	**49%**	**4,460**	**3,314**	**57%**	**43%**	**4,050**	**3,814**	**52%**	**48%**	**53%**	**47%**
Recycled Water	0	458	0%	100%	0	592	0%	100%	0	578	0%	100%	0%	100%
Total (Potable & Recycled)	**3,948**	**4,176**	**49%**	**51%**	**4,460**	**3,906**	**53%**	**47%**	**4,050**	**4,392**	**48%**	**52%**	**50%**	**50%**

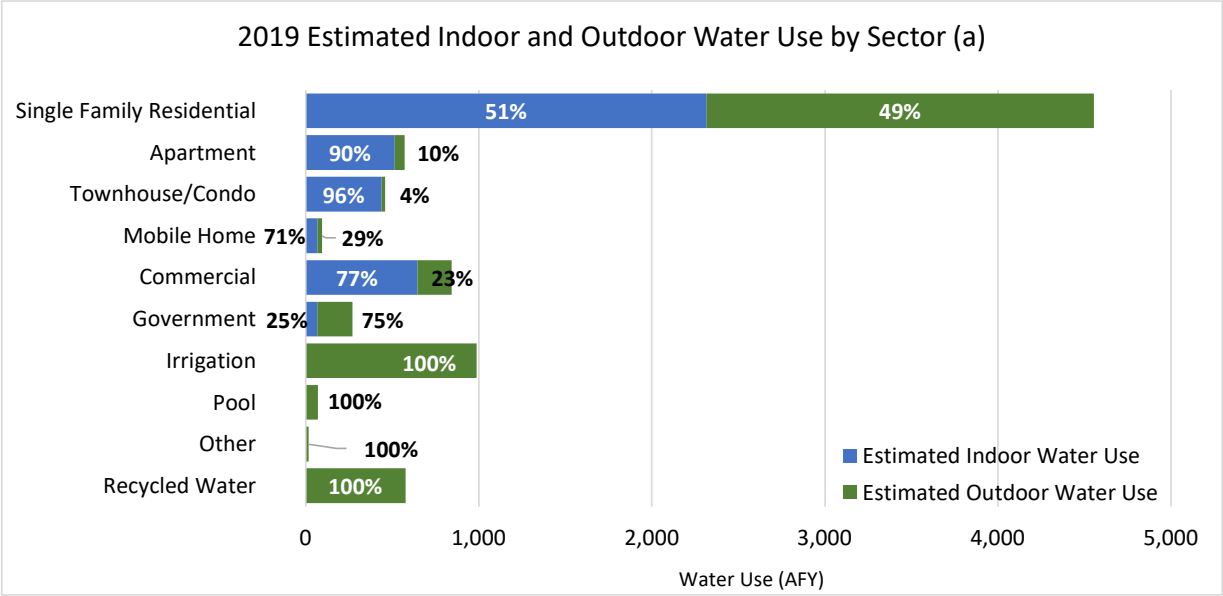


Table 3-7
Estimated Indoor and Outdoor Water Use
North Marin Water District, Sonoma-Marin Saving Water Partnership

Abbreviations:
AFY = acre-feet per year
Pct. = Percentage

Notes:
(a) The minimum average daily water use from November through April was used to estimate indoor water use for all non-irrigation and non-pool customer sectors. This method is used to assess relative proportion of indoor and outdoor use, and conservatively errs on the side of estimating more indoor water use, so that the potential for outdoor water savings is not over-estimated.

References:
1. North Marin Water District, 2020. Billing history data: 2010-2019 MonthlyWaterByService2004_2019.xlsx, provided by North Marin Water District on 13 April 2020.

4. WATER DEMAND PROJECTIONS

The purpose of this section is to document the basis, methodology, and resulting projected demands for the District through 2045. As described in more detail below, the future water demands for the District were estimated by:

1. Applying an estimated growth rate to accounts within each water use sector based on projected population and employment growth rates,
2. Identifying known planned developments within the District to verify that account growth projections consider all anticipated growth,
3. Evaluating and selecting water demand factors for each water use sector based on review of recent average per account water use representing three scenarios,
4. Estimating future passive savings using the Alliance for Water Efficiency (AWE) Water Conservation Tracking Tool (AWE model), and
5. Calculating estimated future water demand that incorporates the anticipated account growth, water demand factors, and estimated future passive water savings.

This methodology is consistent with California Water Code (CWC) § 10631(d)(4)(A), which requires that "Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area." The assumptions used as the bases for demand projections were developed in close coordination with the District and reflect a land-use based approach consistent with the District's community planning.

4.1. Basis for Account Growth Projections

Water demand increases as new accounts are added to the system, among other factors. In order to estimate how accounts will grow within the District, recent historical account growth within the District was considered, as well as projected future growth in population and employment. As described below, it was assumed, that depending on the customer sector, the number of accounts will grow at the same *rate* as the projected population or employment growth.

Table 4-1 presents historical population and 2018 Association of Bay Area Governments (ABAG) Plan Bay Area Projections 2040 population and employment growth projections for the District, in context with recent historical population estimates.[6] In addition, an updated Required Housing Needs Allocation (RHNA) for the City of Novato has been developed through ABAG 2020 (ABAG, 2020). Based on the current RHNA methodology, the City of Novato is required to provide 2,107 new housing units by 2035.

[6] Several growth projections were evaluated as potential bases for growth assumptions, including previous 2013 ABAG Plan Bay Area Projections (ABAG, 2013), ABAG Plan Bay Area Projections 2040 (ABAG, 2018), and 2020 Department of Finance (DOF) Total Estimated and Projected Population for California and Counties (DOF, 2020). The DOF (2020) projections are only available at the County-wide level and show a decline in population over the planning horizon and given the recent historical growth observed in the District, are not considered appropriately conservative for planning purposes. Although anticipated to be released in 2020, updated ABAG projections are not yet available. Therefore ABAG (2018) projections (adjusted for the RHNA) were selected as the basis for growth assumptions for the District.

Assuming 2.57 persons per household, this amounts to an increase in population greater than that projected by ABAG (2018). Population growth adjusted for the City of Novato RHNA is shown as a separate line in **Table 4-1**, and is used as the basis for estimated account growth in all residential sectors.

Table 4-2, identifies which growth projection was applied to each potable water use sector (population or employment) at the District's direction, identifies the average annual growth rate in accounts observed within the District (based on data presented in **Table 3-3**), and the associated average annual growth rate projected by ABAG (2018) and adjusted for the RHNA. With the exception of government accounts, recent historical growth rates have been lower than the projected growth rates by ABAG (2018). At the District's direction, ABAG (2018) projected growth rates adjusted for the new RHNA were used and are considered to be reasonably conservative for planning purposes. The population projections are greater than included in the City of Novato's General Plan 2035, which has yet to be updated to account for the RHNA (City of Novato, 2020).

The planning horizon for the 2020 UWMP is 2045; however, the ABAG (2018) projections extend only through 2040. For purposes of demand projections, it is therefore assumed that the projected growth rates from 2035 through 2040 extend through 2045.

Table 4-2
Historical and Projected Account Growth Rate by Customer Sector

Water Use Sector	Basis for Account Growth	Average Annual Growth (a)	
		Historic (2010-2019)	ABAG (2018), adjusted for RHNA (2020-2045)
Single Family Residential	population	0.082%	0.50%
Existing Accounts			
New Accounts			
Apartment	population	0.075%	0.50%
Townhouse/Condo	population	-0.0036%	0.50%
Mobile Home	population	0%	0.50%
Commercial	employment	-0.25%	0.27%
Government	employment	0.59%	0.27%
Irrigation	employment	-1.9%	0.27%
Pool	population	0.12%	0.50%
Other	employment	1.1%	0.27%

Abbreviations:
ABAG = Association of Bay Area Governments

Notes:
(a) Growth is presented on an average annual basis over the indicated period. When applied to account growth, the specific growth rate between each 5-year period, per ABAG (2018) was applied.
(b) ABAG (2018) projections were adjusted to account for the increased population expected based on the RHNA requirement for the City of Novato to provide 2,100 housing units by 2035 (ABAG, 2020). Population growth rate beyond 2035 is assumed to be the same as projected by ABAG (2018).

4.2. Planned Development Within the Service Area

Future demand projections should account for all growth within the District. In order to verify that the ABAG (2018) growth assumptions (adjusted for the RHNA) appropriately include new developments, known planned developments were inventoried. Based on information contained in the 2018 Novato Water System Master Plan Update, there are currently 51 new development projects in various stages of planning within the District totaling 627 SFR units, 391 MFR units, 21 townhouse/condos, and 1,223,291 sq ft of commercial, industrial, and office floor space (NMWD, 2019). Buildout of these projects ranges from 2025 to 2035. The number of new accounts associated with these planned developments is presented in **Table 4-3**, along with the projected increase in accounts over the planning horizon based on the growth projections described in Section 4.1 and taking into account the planned development described under Section 4.2.

4.3. Water Demand Factors

Water use is influenced by a variety of factors, including weather, economic recession, and state and local regulations, among other drivers. Given this, selecting a "representative" baseline year is important to developing the land-use based water demand factors to estimate baseline water use by existing customers, which can then be extrapolated and applied to future growth within the District.

Water demand factors based on historical use within the District were used as the basis of future demand projections for potable water accounts, considering in particular the range of water use associated with pre-drought conditions, post-drought conditions, and a midpoint scenario that assumes water use partially rebounds to pre-drought conditions. **Table 3-2** provides historical water use by sector within the District. To more fully capture total water use within the District, non-revenue water is estimated as a percentage of potable water production as discussed in 4.3.2.

4.3.1. Potable Water

As shown in **Table 4-4**, the District evaluated a range of potable water demand factors for each potable water use sector using three water use scenarios, based primarily on recent historical average per account water use for selected time periods[7], representing pre-drought water use rates, post-drought water use rates, and a partial rebound to pre-drought water use rates. Specifically:

1. *Pre-drought demand factors* based on the maximum per account water use by sector for 2011 through 2013 (**Table 3-4a**), generally representing higher water use before drought restrictions were put in place.
2. *Post-drought demand factors* based on the maximum per account water use by sector for 2017 through 2019 (**Table 3-4a**), generally representing lower water use than pre-drought conditions but with some amount of rebound.
3. *Partial rebound demand factors* estimated as the midpoint of the pre-drought and post-drought demand factors, representing an average of the two scenarios.

[7] Given the results discussed in Section 3.4, water demand factors for new SFR accounts are based on water use for homes constructed in 1994 and later.

As shown in **Table 4-5**, below, for purposes of developing the District's 2045 demand projections, the District directed EKI to apply pre-drought demand factors to all potable water sectors except for government and irrigation.

Table 4-4
Potential Potable Water Demand Factors Considered

Water Use Sector	Water Demand Factor (GPD/account)		
	Pre-Drought (2011-2013)	Partial Rebound	Post-Drought (2017-2019)
Single Family Residential			
Existing Accounts	351	316	281
New Accounts (a)	426	388	349
Apartment	999	934	868
Townhouse/Condo	155	144	132
Mobile Home	923	875	827
Commercial	1,043	1,001	959
Government	2,397	2,539	2,680
Irrigation	2,046	2,260	2,473
Pool	802	743	684
Other	82	57	32

Abbreviations:
GPD = gallons per day

Notes:
(a) Water demand factors for new single family residential accounts are based on water use per dwelling unit for buildings constructed in 1994 and later, as described in Section 3.4.

Table 4-5
Selected Water Demand Factors

Water Use Sector	Water Demand Factor (GPD/account)	Basis for Demand Factor
Single Family Residential		
Existing Accounts	351	Pre-drought
New Accounts (a)	426	Pre-drought
Apartment	999	Pre-drought
Townhouse/Condo	155	Pre-drought
Mobile Home	923	Pre-drought
Commercial	1,043	Pre-drought
Government	2,680	Post-drought
Irrigation	2,473	Post-drought
Pool	802	Pre-drought
Other	82	Pre-drought

Abbreviations:
GPD = gallons per day

Notes:
(a) Water demand factors for new single family residential accounts are based on water use per dwelling unit for buildings constructed in 1994 and later, as described in Section 3.4.

4.3.2. Non-Revenue Water (Potable Water System)

Non-revenue water is water that has been produced but not billed, and thus does not generate revenue for the supplier. Non-revenue water includes unbilled authorized uses (such as water for fighting fires and flushing mains) and water losses (including real losses due to distribution system leaks and apparent losses due to metering inaccuracies). Urban water retailers are required to perform an annual audit of water loss of their potable water distribution system, which is used as the basis for estimating future water use associated with non-revenue water (DWR, 2020). As shown in **Table 4-6**, potable non-revenue water is projected to range from 301 AFY to 329 AFY through 2045, based on the average percentage of water loss reported from 2017 to 2019 (3.0%, see **Table 3-2**).

4.3.3. Recycled Water

The recycled water system is entirely separate from the potable water system and has a more limited footprint within the District. Expansion of recycled water use is generally dependent on (1) location and proximity to recycled water distribution system, (2) the presence of substantial enough opportunities for use of non-potable water (i.e., irrigation and some small commercial uses such as automatic, drive through car washes) to warrant connection to the recycled water distribution system, and (3) the capacity of the recycled water treatment facility and distribution system to meet the available demand. Due to these factors, while some recycled water use may be expected to increase relative to population or employment growth within the District, system infrastructure is a more significant driver in projecting future recycled water use.

Therefore, projections for recycled water are based on projections developed for the 2015 UWMP and as directed by the District, which consider the current capacity and distribution network for the recycled water system. The projected recycled water demand is 650 AFY.

4.4. Passive Water Savings Estimates

Passive water savings are the water savings associated with the natural replacement of older toilets, showerheads, clothes washers, and other water using appliances with newer high efficiency devices that are available due to both market shifts and increasing efficiency mandated by the building code and other regulatory requirements. The AWE model was used to estimate future passive savings within the District (AWE, 2016). The AWE model takes into account estimates of historical population, residential building stock, number of accounts, and projected population and account growth to estimate future passive savings. Outputs from the AWE model are provided in **Appendix B**. The estimated passive savings are presented in **Table 4-6** and are subtracted from the water demand projected based on the water demand factors described in Section 4.3 above. Passive savings are only applied to potable water use.

4.5. Projected Water Demand Through 2045

Future potable water demand was projected for each sector based on their respective demand factors, non-revenue water estimated as a proportion of total potable water production, and estimated passive savings, and is shown in **Table 4-6**. Recycled water demand, also shown in **Table 4-6**, was projected based on system capacity. Potable water demand is projected to increase to 10,284 AFY in 2045, which is a 24% increase over 2019 water demand. Recycled water demand is projected to increase to 650 AFY, which is

a 12% increase over 2019 water demand. Potable water demand projections are lower than the District's 2015 UWMP demand projections by 26 AFY or 0.25% in 2040.

Table 4-1
Population and Employment Growth Projections
North Marin Water District, Sonoma-Marin Saving Water Partnership

Category	Growth Projections											Total Growth Rate 2020-2045	Average Annual Growth Rate 2020-2045
	2015	2016	2017	2018	2019	2020	2025	2030	2035	2040	2045 (e)		
Population													
Historical Population Estimates (a)	61,381	61,386	61,470	61,616	61,857	61,658	--	--	--	--	--	--	--
District Population Projection, 2018 ABAG (b)	--	--	--	--	--	--	62,352	63,485	64,341	65,092	65,852	6.8%	0.27%
District Population Projections Adjusted for RHNA (c)	--	--	--	--	--	--	63,389	65,440	67,838	68,631	69,432	12.6%	0.50%
Employment													
2018 ABAG Employment Projections (d)	--	--	--	--	--	26,910	27,290	27,915	28,225	28,290	28,355	5.4%	0.27%

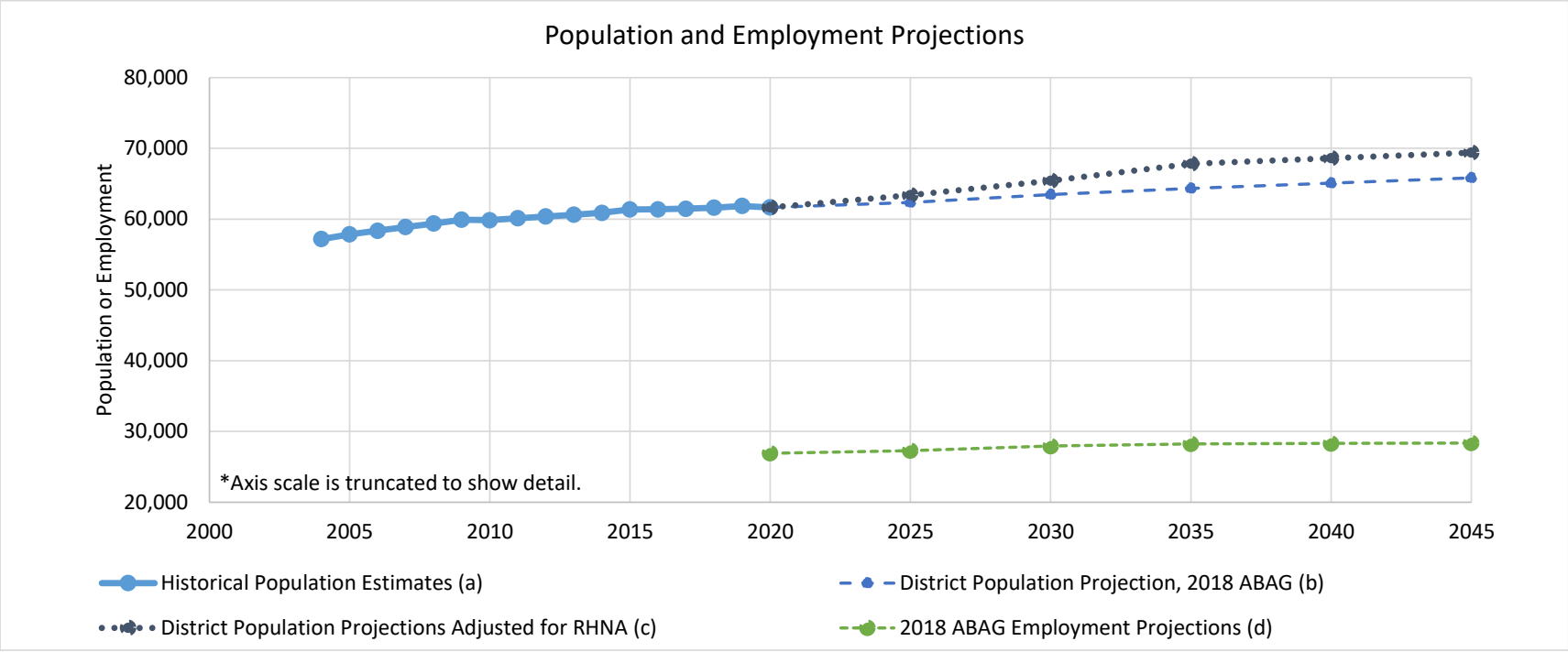


Table 4-1

Population and Employment Growth Projections

North Marin Water District, Sonoma-Marin Saving Water Partnership

Abbreviations:

-- = not available

ABAG = Association of Bay Area Governments

RHNA = Required Housing Needs Allocation

Notes:

(a) Historical population estimates for 2015 per Reference 3, 2020 per Reference 5, and all other years per Reference 4.

(b) District population projections are calculated by applying the City of Novato 2018 ABAG growth rates to the current 2020 population estimate of 61,658 per Reference 5.

(c) The City of Novato is required to provide 2,107 housing units by 2035 based on the RHNA (Reference 2), which is higher than the growth anticipated in the General Plan 2035 and by ABAG 2018. Assuming 2.57 persons per household and a linear increase in future housing units, the population growth from 2025 to 2035 is adjusted by adding the customers of the new housing units to the District population projection (2018 ABAG). Population growth rate beyond 2035 is assumed to be the same as the ABAG 2018 projection.

(d) 2018 ABAG population and employment projections per Reference 1. Projections shown reflect the City of Novato, and not the entirety of the District service area. The growth rate reflected by this projection was applied to the current estimated 2020 population of 61,658 to extrapolate growth for the District service area.

(e) ABAG 2018 includes projections through 2040. 2045 employment projections are calculated based on the 2035-2040 growth rate (0.23%).

References:

1. ABAG, 2018. Association of Bay Area Governments, Plan Bay Area Projections 2040, released on November 2018.
2. ABAG, 2020. Association of Bay Area Governments, Regional Housing Needs Allocation Proposed Methodology: San Francisco Bay Area, 2023-2031, released on October 2020.
3. North Marin Water District, 2016. 2015 Urban Water Management Plan, prepared by North Marin Water District, dated June 2016.
4. North Marin Water District, 2020a. NMWD Historical Population.xlsx, provided by North Marin Water District on 6 April 2020.
5. North Marin Water District, 2020b. Information provided by North Marin Water District via email, received 22 July 2020.

Table 4-3

Change in Number of Accounts based on Projected Growth

North Marin Water District, Sonoma-Marin Saving Water Partnership

Projected Number of Accounts

Water Use Sector	Number of Accounts (a)				
	2025	2030	2035	2040	2045 (b)
Single Family Residential	15,280	15,775	16,353	16,544	16,737
Apartment	612	632	655	663	671
Townhouse/Condo	3,198	3,302	3,423	3,463	3,503
Mobile Home	105	108	112	114	115
Commercial (c)	821	840	850	852	853
Government	100	103	104	104	104
Irrigation	361	369	373	374	375
Pool	95	98	101	102	104
Other (d)	476	487	492	493	494
Total Accounts	**21,049**	**21,713**	**22,463**	**22,708**	**22,956**

Incremental Increase in Accounts from 2019

Water Use Sector	Number of Accounts				
	2025	2030	2035	2040	2045
Single Family Residential	417	912	1,490	1,681	1,874
Apartment	19	39	62	70	78
Townhouse/Condo	87	191	312	352	392
Mobile Home	3	6	10	12	13
Commercial (c)	11	30	40	42	43
Government	1	4	5	5	5
Irrigation	5	13	17	18	19
Pool	3	6	9	10	12
Other (d)	7	18	23	24	25
Total New Accounts	**554**	**1,218**	**1,968**	**2,213**	**2,461**

Table 4-3

Change in Number of Accounts based on Projected Growth

North Marin Water District, Sonoma-Marin Saving Water Partnership

Estimate of Known Planned Development

Water Use Sector	Number of Accounts; Cumulative (e)				
	2025	2030	2035	2040	2045
Single Family Residential	11	615	627	627	627
Apartment	19	33	33	33	33
Townhouse/Condo	--	21	21	21	21
Mobile Home	--	--	--	--	--
Commercial (c)	11	27	32	32	32
Government	--	--	--	--	--
Irrigation	--	--	--	--	--
Pool	--	--	--	--	--
Other (d)	--	--	--	--	--
Total New Accounts	**41**	**696**	**713**	**713**	**713**

Abbreviations:

-- = not available

ABAG = Association of Bay Area Governments

CII = commercial, industrial and governmental/institutional

RHNA = Required Housing Needs Allocation

Notes:

(a) Growth in number of accounts is estimated based on ABAG 2018 projected growth rates for population and employment, adjusted for updated RHNA requirements. Residential and "pool" sectors are estimated relative to population growth, while CII, irrigation, "other" and recycled water accounts are estimated relative to employment growth. Growth associated with known planned developments are within the RHNA adjusted ABAG growth rate projections except apartment accounts, which are adjusted for known planned development beyond that anticipated by ABAG 2018 growth rates.

(b) ABAG 2018 includes projections through 2040. For the purposes of demand and account projections, It is assumed that the growth rate remains constant from 2036 through 2045.

(c) Commercial includes combined commercial/residential accounts.

(d) Other includes livestock, hydrants, other fire services.

(e) Known planned development is discussed in Section 3.1 and based on Reference 3.

References:

1. ABAG, 2018. Association of Bay Area Governments, Plan Bay Area Projections 2040, released on November 2018.
2. North Marin Water District, 2016. 2015 Urban Water Management Plan, prepared by North Marin Water District, dated June 2016.
3. North Marin Water District, 2019. 2018 Novato Water System Master Plan Update, prepared by North Marin Water District, dated September 2019.

Table 4-6
Projected Water Demand
North Marin Water District, Sonoma-Marin Saving Water Partnership

Water Use Sector	Projected Demand (AFY) (a)				
	2025	2030	2035	2040	2045
Potable Water					
Single Family Residential					
Existing Accounts	5,839	5,839	5,839	5,839	5,839
New Accounts (b)	199	435	711	803	895
Apartment	686	708	734	743	751
Townhouse/Condo	556	574	595	602	609
Mobile Home	108	112	116	117	119
Commercial	961	983	993	996	998
Government	302	309	312	313	313
Irrigation	1,001	1,024	1,035	1,038	1,040
Pool	85	88	91	92	93
Other	44	45	45	46	46
Non-revenue Water (c)	3.0%	3.0%	3.0%	3.0%	3.0%
	301	311	322	325	329
Estimated Passive Savings (d)	-216	-396	-550	-659	-749
Total Potable Demand	**9,866**	**10,031**	**10,245**	**10,254**	**10,284**
Recycled Water					
Recycled Water (e)	595	608	622	636	650
Total Recycled Water Demand	**595**	**608**	**622**	**636**	**650**

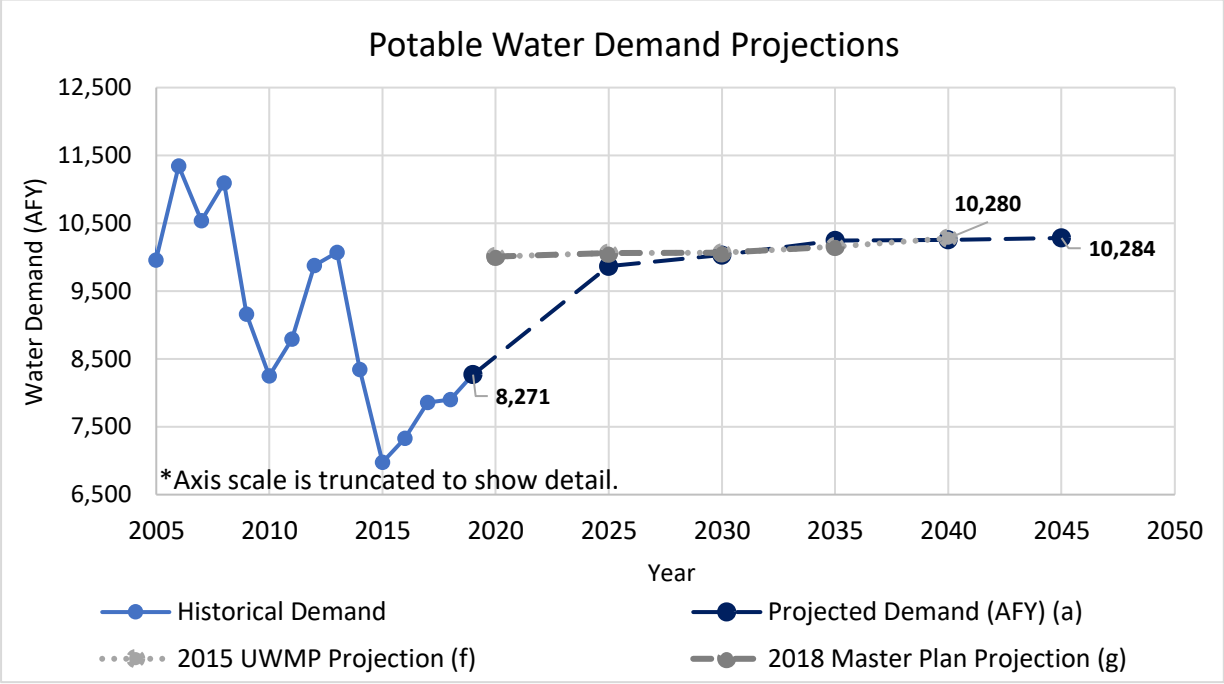
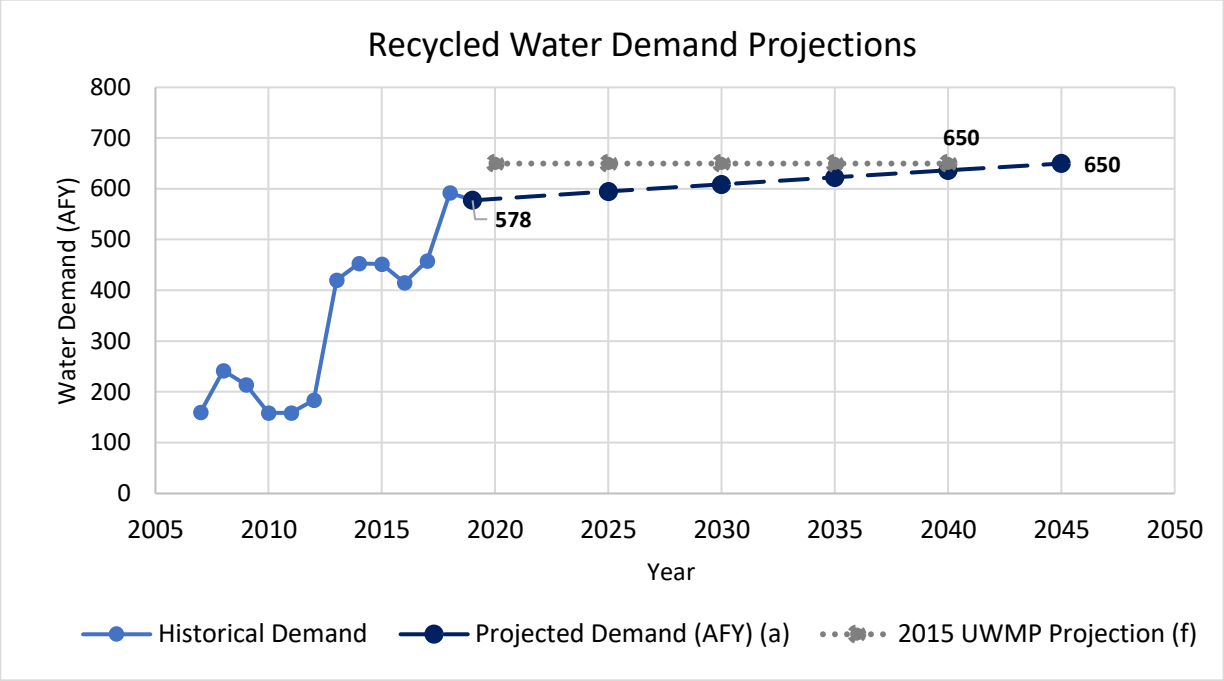


Table 4-6
Projected Water Demand
North Marin Water District, Sonoma-Marin Saving Water Partnership



Abbreviations:
ABAG = Association of Bay Area Governments
AFY = acre-feet per year
AWE = Alliance for Water Efficiency
UWMP = Urban Water Management Plan

Notes:
(a) Water demand projections are estimated based on pre-drought demand factors, based on recent historical use. Growth in accounts is based on ABAG 2018 projections, as identified in Table 4-1.
(b) Water demand factors for new single family residential accounts are based on water use per dwelling unit for buildings constructed in 1994 and later.
(c) Estimates of non-revenue water are based on the average percentage of water loss reported for 2017 through 2019, per Table 3-2.
(d) Passive water savings are based on the AWE Conservation Tracking Tool.
(e) Recycled water projections per Reference 2.
(f) 2015 UWMP projections per Reference 2.
(g) 2018 Master Plan projections per Reference 3.

Table 4-6

Projected Water Demand

North Marin Water District, Sonoma-Marin Saving Water Partnership

References:

1. ABAG, 2018. Association of Bay Area Governments, Plan Bay Area Projections 2040, released on November 2018.
2. North Marin Water District, 2016. 2015 Urban Water Management Plan, prepared by North Marin Water District, dated June 2016.
3. North Marin Water District, 2019. 2018 Novato Water System Master Plan Update, prepared by North Marin Water District, dated September 2019.

5. CONSERVATION PROGRAM PARTICIPATION

The following section evaluates historical participation in water conservation programs by District customers and the estimated water savings associated with that participation. This information is used to inform future program selection and implementation assumptions, and to support the demand management measure (DMM) reporting required in UWMPs under CWC § 10631.(e).[8]

For five water conservation programs selected by the District, additional analyses have been conducted, including: (1) a refined estimate of the actual water conservation savings achieved by District customers based on customer billing data (Section 5.3.2), and (2) program participation trends in relation to spatial distribution (Section 5.4), property characteristics (Section 5.5), and customer demographics (Section 5.6). The following five programs were included in the detailed analyses:

1. Cash for Grass Rebate Program
2. High efficiency clothes washer (HECW) Rebate Program
3. High efficiency toilet (HET) Rebate Program
4. Water Smart Survey Program
5. Weather-Based Irrigation Controller (WBIC) Rebate Program

The goals of these more detailed analyses are to identify participation drivers and to help the District better understand which customers are participating in which programs. The District can accordingly use this information to inform the strategic design, selection, and marketing of future conservation programs and services.

5.1. Conservation Programs

The District currently provides a broad variety of water conservation programs directly to customers. These programs are described in **Table 5-1** below.

[8] The information presented herein supports a portion of the required DMM analysis, focusing on device and education-focused programs. Additional details regarding customer billing rates and structure, conservation staffing levels, customer metering, etc. are required under CWC § 10631.(e), but not addressed herein.

Table 5-1
Description of Conservation Programs

Program	Description	Eligible Customer Class(es)	Program Run Dates
Water Smart Home Surveys Program	In-depth analysis of the residential customer's indoor and outdoor water use with water efficient recommendations to implement.	SFR	2008 - 2019
Water Smart Commercial Surveys Program		CII	2008 - 2019
Residential HET Rebates Program	Incentive available for qualifying customers who replace toilet(s) that use more than 1.6 gallons per flush and replaces same with a District approved HET or UHET.	SFR	2008 - 2019
Commercial HET Rebates Program		CII	2008 - 2019
UHET Distribution Program		SFR	2008 - 2019
Retrofit on Resale (Dwellings Certified) Program	All existing plumbing fixtures in existing structures receiving water from the District's water system shall, at the time of change of ownership, be retrofitted, if not already done, exclusively with water conserving plumbing fixtures per Regulation 15 Section M.	SFR	2008 - 2019
HECW Rebates Program	District customers are eligible for rebate as available from time to time for District approved high-efficiency washing machines in existing residences.	SFR	2008 - 2019
Cash for Grass Rebates Program	Incentive available for customers who remove regularly maintained and irrigated lawn areas and replace with District-approved low water use plantings on drip irrigation.	SFR, Irrig	2008 - 2019
Lawn Be Gone (Sheet Mulching) Program	Sheet mulching materials (Cardboard, Compost and Mulch) in available to customers who wish to cover their regularly maintained and irrigated lawn areas.	SFR	2015 - Current
Water Smart Landscape Rebates Program	Landscape water efficient rebates are available to customers who install District qualified water efficient landscape equipment.	SFR	2009 - Current
Residential WBIC Rebates Program	Incentive available, on a per irrigation valve basis, for the installation of District approved weather based irrigation controllers.	SFR	2008 - Current
Commercial WBIC Rebates Program		CII	2008 - Current
Swimming Pool Cover Rebates Program	District customers are eligible for rebates for purchasing District approved swimming pool covers.	SFR	2008 - Current
Residential New Development Water Use Efficiency Requirements	New and applicable rehabilitated existing development projects are subject to the water use efficiency requirements of Regulation 15, Sections E. and F. The requirements specify both indoor fixtures and appliances (Section E) and landscaping requirements (Section F) equivalent to and greater than the State MWELO.	SFR	2009 - Current
Commercial New Development Water Use Efficiency Requirements		CII	2009 - Current
Large Landscape Audits Program	Detailed irrigation audits are available to all large landscape dedicated irrigation and mixed-use metered customers. Audit	Irrig.	2008 - Current

Table 5-1
Description of Conservation Programs

Program	Description	Eligible Customer Class(es)	Program Run Dates
	includes (but is not limited to) review of existing practices and provides recommendations for improved water use efficiency.		
Hot Water Recirculation Rebate Program	Incentive available to customers who install District qualified hot water recirculation systems.	SFR	2015 - Current

Abbreviations:
CII = commercial, industrial and institutional
d.u. = dwelling unit
HECW = high-efficiency clothes washer
HET = high-efficiency toilet
Irrig. = irrigation
MWELO = Model Water Efficient Landscape Ordinance
SFR = single family residential
UHET = ultra high efficiency toilet

In addition to programs offered by the District, several regional water conservation programs are offered through the SMSWP, including: (1) education and outreach to schools, (2) public outreach and educational workshops, (3) Qualified Water Efficient Landscaper (QWEL) Training, and (4) garden tours.

5.2. Historical Conservation Program Participation

As shown in **Table 5-2**, the District has implemented 17 different conservation programs that were offered directly to customers during the 2008 through 2019 time period. Of the programs implemented by the District, the Residential HET Rebates Program, Water Smart Home Surveys Program, and Retrofit on Resale (Dwellings Certified) Program had the highest participation, with 4,040, 3,538, and 3,260 participants, respectively. Through the Cash for Grass Rebates Program, Lawn Be Gone (Sheet Mulching) Program, and Cash for Grass Rebates Program for Irrigation Accounts, nearly 735,000 square feet of turf has been removed.

Table 5-3 summarizes District participation in the regional SMSWP water conservation school education and outreach programs during the 2015-2016 through 2019-2020 school years. Over this period, over 3,600 students were reached by direct instruction and nearly 10,300 students were reached through indirect instruction such as assemblies, video and poster contests, and distribution of other educational materials.

5.3. Estimated Savings from Past Conservation Programs

5.3.1. Estimated Water Savings Based on AWE Model

The AWE model was used to estimate water savings associated with the implementation of all device or turf replacement and audit programs identified in **Table 5-2** for the period of 2010 to 2020 (AWE, 2016). Water savings estimates were based on District-specific values calculated per Section 5.3.2, AWE model default values, values developed for the District in 2015, and other literature values, as needed. The

specific assumptions used in this assessment are presented in **Appendix B**. The results of this analysis are presented in **Table 5-4**.

Based on the record of water conservation program participation within the District and application of the AWE Model, it is estimated that the District conservation programs included in this assessment resulted in a savings of between 831 AFY to 1,493 AFY between 2010 and 2020.[9] In addition, over this period, it is estimated that the District saved 2,481 AFY through passive savings. Thus, the total active and passive savings achieved by the District between 2010 and 2020 is estimated to be between 3,143 AFY and 3,974 AFY.

5.3.2. Estimated Water Savings for Five Selected Programs Based on Customer Billing Data

Water use savings associated with implementation of specific water conservation programs are typically estimated based on literature values, which may or may not accurately capture the specific ways customers in a specific area (i.e., the District) use water. Therefore, District customer billing data were analyzed using a modified *Difference in Difference Estimation Method* (Columbia Public Health, 2013) to assess the amount of water typically saved through implementation of the five selected programs. As described further in **Appendix C**, a version of this method is used to compare the water use patterns in a participant group to that of a cohort group to isolate the impact (in terms of water savings) of participation in a specific water conservation program.

Table 5-5 summarizes the average estimated water savings for each selected conservation program from 2010-2017.[10] The WBIC Rebate Program demonstrated the most savings at 18,469 gallons per account per year (gal/acct/yr), followed by the Water Smart Survey Program at 12,826 gal/acct/yr, and the Cash for Grass Rebate Program at 11,446 gal/acct/yr. It should be noted that the WBIC Rebate Program analysis includes only 30 program participants with highly variable results among these participants (as shown in Table **5-6d**), and is therefore considered less robust than the other analyses. It should also be noted that in many cases, the results indicate a negative savings value, suggesting that this program does not result in water savings among all customers. These results are consistent with those found in other water agencies and suggest that newly installed WBICs may often not be configured properly, and that customers may benefit from an education or WBIC-setup support program in order to realize water savings.

[9] Free ridership refers to customers who participate in a conservation program, but who would have taken the water saving action (e.g., replace a toilet) regardless of whether the conservation program incentive was available. The amount of free ridership is unknown, and thus a range of savings is shown, assuming 0% to 100% free ridership for programs, as appropriate.

[10] This time period was selected so that at least two full years of water use billing data could be analyzed following the program participation year.

Table 5-5
Average Estimated Water Savings Achieved by Selected Conservation Programs from 2010-2017

Conservation Program	Number of Participants in Analysis (a)	Estimated Savings due to Program (b) (gal/acct/yr)	Estimated NMWD-Specific Unit Savings	Default AWE Model Unit Savings Factors
Cash for Grass Rebate Program	268	11,446	12 gal/sq ft/yr	14.3 gal/sq ft/yr
HECW Rebate Program	1,232	5,189	5,189 gal/unit/yr	5,000 gal/unit/yr
HET Rebate Program	804	5,984	3,429 gal/unit/yr	9,667 gal/unit/yr
Water Smart Survey Program	489	12,826	12,826 gal/survey/yr	12,373 gal/survey/yr
WBIC Rebate Program	30	18,469	18,469 gal/WBIC/yr	7,985 gal/acct/yr (c)

Abbreviations:
acct = account
gal = gallon
HECW = high efficiency clothes washer
HET = high efficiency toilet
sq ft = square feet
WBIC = Weather-Based Irrigation Controller
yr = year

Notes:
(a) Program participants included in this analysis are limited to those that: (1) have only participated in the specified program, (2) have only participated in the program in the specified year, and (3) have sufficient water use data within the study periods.
(b) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts, as shown in **Tables 5-6a** through **5-6e**. Water savings comparison cohorts for all customers are stratified geographically based on Census Block Groups.
(c) Default value not available in the AWE model. Water savings factor shown is per NMWD's 2015 DSS Model, and represents estimated savings per SFR account (NMWD, 2015).

Tables 5-6a through **Table 5-6e** summarize the detailed results of these analyses, including the number of participants included in the analysis for each year, the total amounts rebated, the change in water use by participants and their comparison cohort groups, and the estimated savings values by year and in total.

Table 5-5 also shows the default water savings factors included in the AWE model, which are based on available literature values and other assumptions. Water savings based on customer billing data for the Cash for Grass Rebate, HECW Rebate, and Water Smart Survey Programs are consistent with AWE model default values. However, water savings for the HET Rebate Program are lower than the default values, and therefore evaluation of potential savings for future programs would be significantly overestimated for District customers if default values are used. Conversely, savings from the WBIC Rebate Program are higher when comparing customer billing data to model default values, resulting in a potential for under-estimation of program savings.

5.4. Spatial Trends in Program Participation

Given the large amount of program participation data, it can be difficult to ascertain whether participation in these programs has been evenly distributed across the service area, or if participation tends to be clustered in certain regions. In order to identify program participation density for conservation programs in the District service area, a geostatistical spatial analysis was performed.[11] This analysis identifies participation "hot spots," which are areas where a higher density of participation is observed than would be expected by randomly distributed participation. Similarly, "cold spots," or areas of lower than expected participation, are identified. Ineligible parcels (i.e., parcels with no sector use relevant to each respective conservation program) were excluded from each analysis, as well as very large rural SFR parcels (e.g., greater than 10 acres), to reduce skewing of density mapping. High density participation areas are identified in red and low density participation areas are identified in blue on **Figures 5-1a** through **5-1e.**

Figures 5-1a and **5-1b** show the results of the participation destiny analysis for the HECW and HET Rebate Programs, both of which target indoor water use. While participation for these programs are similar (1,971 participants and 2,291 participants respectively), the spatial distribution is somewhat different. Both programs show areas of high participation in the central portion of the service area, however the HET Rebate Program appears to have more significant distinct areas of high and low participation.

As shown in **Figure 5-1c**, the Water Smart Survey Program, which targets both indoor and outdoor water use, shows higher participation in the central and southeastern portions of the service area, as well as some smaller clusters of lower participation in southern, western and eastern regions.

The Cash for Grass Rebate Program, shown in **Figure 5-1d**, showed a similar spatial distribution to that of the Water Smart Survey Program. By contrast, the WBIC Rebate Program, shown in **Figure 5-1e**, showed one cluster of higher participation in the south-central portion of the service area. This program only included 128 participants and therefore produced less robust results than the other programs that were assessed.

Based on this information, the District could consider targeting outreach to the portions of its service area located in areas with historically lower program participation.

5.5. Building Stock Characteristics

Certain characteristics related to building age can influence, or at least be correlated with, water use. In general, older homes and businesses tend to have higher water using fixtures that were installed prior to passage of key changes to the Federal and California Plumbing, Energy, and Building Codes; these accounts present an opportunity for increasing water conservation. Homes and businesses with larger landscaped areas tend to use more water than those with smaller landscaped areas. Similarly, larger homes may have more occupants and therefore more water use.

[11] The ESRI ArcGIS 10.8 Optimized Hot Spot Analysis tool was used for spatial hot spot analysis of program participation. The hot spot analysis calculates a Getis Ord GI* statistic for each cell. This statistical z-score evaluates how the event (in this case, participation in the program) clusters spatially, by looking at the cell in the context of the neighboring cells. For the purposes of this study, hot and cold spots are identified as cells with a 90% or greater level of statistical confidence.

In order to assess the distribution of housing stock and other key water use characteristics, service area-wide data were evaluated based on Marin County Assessor parcel data. These data included lot sizes and building construction date for residential program participants. Building construction date for parcels within the District based on Marin County Assessor data is shown on **Figure 5-2**. This figure shows parcels for all land use types for which building construction date is available (e.g., residential, commercial, open space, etc.).

Building stock characteristics of conservation program participants for each of the five selected programs are summarized in **Table 5-7**.[12] The first chart shows the total number of participants by program by age of building construction, while the second chart shows the results after controlling for the relative number of parcels within each age category.

The average year of building construction for each program ranged from 1977 to 1988. The vast majority of program participants are in homes built prior to 1994, for all programs. When the results are normalized based on total building stock, homes constructed from 1994-2009 had the highest rates of participation in the WBIC Rebate and Water Smart Survey Programs.

Based on this analysis, the District appears to be successfully reaching older homes, particularly with the HET Rebate Program. SFR customers with homes in all age ranges are participating in the Cash for Grass Rebate and HECW Rebate Programs at generally consistent rates. However, there does appear to be opportunity to increase participation in: (1) the HECW Rebate Program among MFR customers with pre-1994 homes, and (2) the Water Smart Survey Program among MFR customers with 1994-2009 homes. There is also opportunity to increase participation in the WBIC Rebate Program in older homes, however, as noted in Section 5.3.2, above, this program may also benefit from the addition of a customer education or WBIC-setup support component in order to realize consistent savings among customers.

5.6. Demographic Characteristics of Residential Conservation Program Participation

Residential conservation programs are generally open to all residents in the District service area. Although the programs are available to all residents, those with certain demographic characteristics can tend to participate at higher rates than others in some programs. The analyses described in the following sections were performed for the five selected programs in order to better understand trends in customer demographics among residential conservation program participants in the District – specifically, income, whether the home occupants rent or own the property, and household age.

5.6.1. Household Income Trends

Household income data were based on the estimated 2017 median household income by Census Block Group (Census, 2019).[13] The following sections discuss the breakdown of program participation in residential programs by income classification. These income levels are defined as follows: low income (<$94,850/year), moderate income ($94,850-$124,500), and high income (>$124,500), based on Marin County income designations for a three-person household (HCD, 2017). Given that these classifications

[12] Results for SFR and MFR participants are shown separately, given the diversity of building stock.

[13] Census Block Group is the smallest geographical unit for which the United States Census Bureau publishes income data.

reflect the median of all households in a given Census Block Group, this reflects the predominant income for that area (neighborhood), but does not mean that every participant or household in that area falls within the same income group.

Figure 5-3a shows the distribution of income groups across the service area and **Table 5-8a** shows the distribution of residential program participants by income level. The first chart in **Table 5-8a** shows the percentage of participants in each program that live in areas of each income level grouping. Participation in all conservation programs by median household income was relatively evenly dispersed across income groups.

The second chart on **Table 5-8a** shows participation rates controlled for the number of parcels within the service area within each income group. For every program except the HET Rebate Program, there were proportionally more moderate and high income group participants than low income group participants. For the HET Rebate Program, there was little difference among all income groups relative to the overall percentage of customers.

These results suggest that there are opportunities to increase program participation by lower income households in the Cash for Grass Rebate, HECW Rebate, Water Smart Survey, and WBIC Rebate Programs.[14]

5.6.2. Homeownership Trends

In order to evaluate whether home ownership appears to be a driving factor in program participation, residential program participation was compared to the proportion of the population that live in renter-occupied homes, based on Census data. Rentership status was based on 2017 Census estimates of the population within a Census Block Group that live in a renter-occupied home versus an owner-occupied home (Census, 2019). Rentership is thus presented as the proportion of the population within a Census Block Group that lives in a renter-occupied home. A Census Block Group with a rentership of less than 25% indicates that the area consists primarily of owner-occupied homes, while a rentership population of greater than 75% indicates that the area is predominantly made up of those who rent their homes.

Figure 5-3b shows the distribution of renter-occupancy rate across the District. **Table 5-8b** shows the distribution of residential program participation by the percentage of the population that live in renter-occupied homes ("rentership").

The first chart in **Table 5-8b** shows the percentage of participants in each program that live in areas of each percent rentership grouping. Participation in conservation programs was higher in Census Block Groups with a lower percentage of rentership (high home ownership). Between 69% and 81% of participants across all conservation programs were in Census Block Groups that had less than or equal to 25% rentership, compared to 0%-3% of participants in the high rentership category (≥ 75% rentership).

The second chart in **Table 5-8b** shows participation rates controlled for the number of customers within the District that fall within each rentership classification. When the relative proportion of number of

[14] As noted in Section 5.3.2, above, the WBIC Rebate Program may also benefit from the addition of a customer education or WBIC-setup support component in order to realize consistent savings among customers.

customers within each rentership group is controlled for, participants in the low rentership (high home ownership) category are 6.2%-18% higher than the overall percentage of customers in the same category. Conversely, participants in the low to moderate rentership groups (≤25%-50% rentership) were underrepresented by 2.8% to 9.7%.

These results suggest that the highest participation is by customers who own their own home, and thus there are opportunities to increase program participation for all five programs by targeting areas of high rentership.

5.6.3. Household Age Trends

Median household age is based on 2017 Census estimates of the median age of household members by Census Block Group (Census, 2019). Median age is broken up as follows: <35 years old, 35-45 years old, 45-55 years old, and >55 years old. Given that these classifications reflect the median age of all household members in a given Census Block Group, this reflects the predominant age for that area but does not mean that every participant or household in that area falls within the same age group.

Figure 5-3c shows the distribution of median household age by Census Block Group across the service area and **Table 5-8c** shows the distribution of residential program participants by age group. The first chart in **Table 5-8c** shows the percentage of participants in each program that live in areas of each household age grouping. Participation was highest for households whose median household member age was between 45-55 years, ranging from 57%-61%. The lowest participation was in households with a median age of less than 35 years, comprising 1.6%-4.7% of all participants.

The second chart in **Table 5-8c** shows participation rates controlled for the number of parcels within the service area within each median household age group. Compared to the overall distribution of customers, there was little difference among age groups for most conservation programs, with the exception of the WBIC Rebate Program, which had a higher proportion of participants from households with a median age older than 55 years (12% higher) and a lower proportion of participants 35-45 years (12% lower).

These results suggest that the District has been successful at reaching customers of all age groups in all programs, with the exception of the WBIC Rebate Program. It should be noted that due to the smaller sample size for the WBIC Program, these results may be less robust than for other programs, however the results do suggest that there may be opportunities to increase participation in the WBIC Program by targeting younger customers.[15]

5.7. Summary

Sections 5.4 through 5.6 above identify opportunities for the District to increase customer participation in each of the five programs through targeted outreach to certain customer classes. The results of these analyses can be combined to identify specific customers by overlaying these results spatially. For example, one may identify SFR customers to target with the Cash for Grass Program by overlaying customers in areas: (1) outside of high participation as identified on **Figure 5-1d**, (2) within the low income areas

[15] As noted in Section 5.3.2, above, the WBIC Rebate Program may also benefit from the addition of a customer education or WBIC-setup support component in order to realize consistent savings among customers.

identified on **Figure 5-3a**, and (3) in areas of with greater than 25% rentership as shown on **Figure 5-3b**. As show on **Figure 5-4,** by overlaying these key metrics, approximately 1,400 SFR customers are identified for potential targeting of Cash for Grass Program outreach materials.

Table 5-2
Summary of Conservation Program Participation
North Marin Water District, Sonoma-Marin Saving Water Partnership

Program Name	End Use		Number of Program Participants (b)													Pct. of Accounts (c)
	Sector (a)	Indoor/ Outdoor	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total	
Water Smart Home Surveys Program	SFR	Both	213	305	330	345	283	177	366	364	224	385	301	245	**3,538**	**24%**
Water Smart Commercial Surveys Program	CII	Both	28	22	39	20	5	4	5	7	5	10	4	2	**151**	**17%**
Residential HET Rebates Program	SFR	Indoor	368	511	541	568	230	238	348	352	354	211	147	172	**4,040**	**27%**
Commercial HET Rebates Program	CII	Indoor	32	137	13	64	5	9	1	17	4	3	3	3	**291**	**32%**
UHET Distribution Program	SFR	Indoor	502	764	0	0	0	0	497	85	10	0	0	0	**1,858**	**13%**
Retrofit on Resale (Dwellings Certified) Program	SFR	Indoor	248	303	322	280	274	315	293	288	236	278	249	174	**3,260**	**22%**
HECW Rebates Program	SFR	Indoor	415	543	476	468	312	252	308	155	103	55	24	16	**3,127**	**21%**
Cash for Grass Rebates Program	SFR, Irrig	Outdoor	25	57	99	50	39	33	52	133	132	59	18	18	**715**	**4.7%**
Water Smart Landscape Rebates Program	SFR	Outdoor	--	21	23	15	8	3	9	8	7	8	4	8	**114**	**0.77%**
Residential WBIC Rebates Program	SFR	Outdoor	10	10	5	0	2	22	18	8	7	11	15	19	**127**	**0.85%**
Commercial WBIC Rebates Program	CII	Outdoor	4	4	20	1	1	0	0	0	0	0	0	0	**30**	**3.3%**
Swimming Pool Cover Rebates Program	SFR	Outdoor	69	20	2	2	0	0	0	25	27	3	5	5	**158**	**1.1%**
Residential New Development Sign-offs Program	SFR	Both	--	82	85	19	16	17	18	27	28	36	24	19	**371**	**2.5%**
Commercial New Development Sign-offs Program	CII	Both	--	41	24	22	16	20	14	22	21	23	16	22	**241**	**27%**
Large Landscape Audits Program	Irrig.	Outdoor	20	12	19	6	0	16	5	0	8	0	9	10	**105**	**29%**
Lawn Be Gone (Sheet Mulching) Program	SFR	Outdoor	--	--	--	--	--	--	--	15	5	2	3	3	**28**	**0.19%**
Hot Water Recirculation Rebate Program	SFR	Indoor	--	--	--	--	--	--	--	15	5	1	4	2	**27**	**0.18%**
			Total Turf Removed (sq ft)													
Cash for Grass Rebates Program	SFR	Outdoor	17,525	49,028	104,288	42,654	27,935	27,207	46,485	114,341	132,226	51,432	14,227	33,392	**660,740**	--
Lawn Be Gone (Sheet Mulching) Program	SFR	Outdoor	--	--	--	--	--	--	--	10,000	3,500	1,600	2,400	2,400	**19,900**	--
Cash for Grass Rebates Program for Irrigation Accounts (d)	Irrig.	Outdoor	53,553												**53,553**	--
Total (sq ft)			**71,078**	**49,028**	**104,288**	**42,654**	**27,935**	**27,207**	**46,485**	**124,341**	**135,726**	**53,032**	**16,627**	**35,792**	734,193	--

Table 5-2
Summary of Conservation Program Participation
North Marin Water District, Sonoma-Marin Saving Water Partnership

Abbreviations

CII = Commercial, Industrial, Institutional
HET = High Efficiency Toilet
HECW = High Efficiency Clothes Washer
Irrig. = Irrigation Accounts
SFR = Single-family residential
sq ft = Square feet
UHET = Ultra High Efficiency Toilet

Notes

(a) Sector indicates predominant customer category for program participants.
(b) Participation is summarized by fiscal year.
(c) Participation is calculated as a percentage of total accounts of the predominant sector indicated.
(d) Annual breakdown of turf removal square footage is not available for the Cash for Grass Rebates Program for irrigation accounts.
(e) Colored shading is added for visualization purposes. Green shading represents higher participation values.

Table 5-3
Summary of Conservation School Education Program Participation
North Marin Water District, Sonoma-Marin Saving Water Partnership

Program Name	Number of Students Reached by School Year					
	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	Total
Direct Instruction						
Kindergarten	161	143	142	224	249	**919**
3rd Grade	161	143	75	263	178	**820**
5th Grade	335	534	422	310	0	**1,601**
Middle/High School	90	204	0	0	0	**294**
Total	**747**	**1,024**	**639**	**797**	**427**	**3,634**
Indirect Instruction						
ZunZun Assembly	406	327	0	1,097	680	**2,510**
Video Contest	1	4	0	1	0	**6**
WA Poster Contest	176	0	307	0	109	**592**
Materials	1,605	1,639	1,047	1,002	1,882	**7,175**
Total	**2,188**	**1,970**	**1,354**	**2,100**	**2,671**	**10,283**

Abbreviations

SMSWP = Sonoma-Marin Saving Water Partnership
WA = Water Awareness

Notes

(a) School education program participation is presented by number of students reached, per SMSWP, 2020.
(b) Colored shading is added for visualization purposes. Green shading represents higher participation values.

Source

SMSWP, 2020. Water Conservation School Education Participation 2015 - 2020, provided by SMSWP on 8 June 2020.

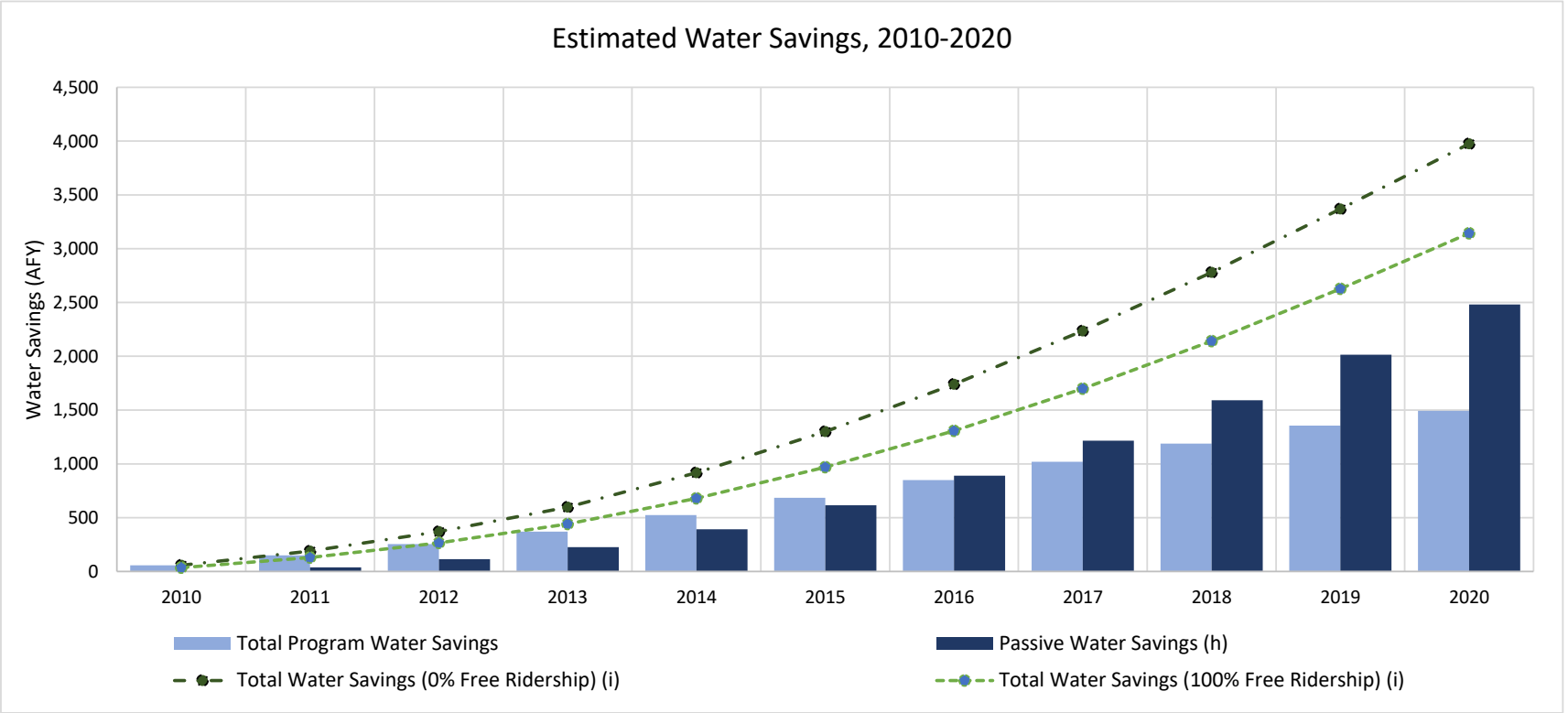
Table 5-4

Estimated Water Savings Achieved by Conservation Programs and Passive Savings

North Marin Water District, Sonoma-Marin Saving Water Partnership

Water Saving Type	End Use		Estimated Cumulative Water Savings (AFY) (b)										
	Sector (a)	Indoor/ Outdoor	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Conservation Programs (c)													
Water Smart Home Surveys Program	SFR	Both	13	37	67	98	138	179	217	259	302	341	367
Water Smart Commercial Surveys Program	CII	Both	14	32	49	64	77	86	92	101	108	114	118
HET Rebates Program (d)(e)	SFR,CII	Indoor	10	30	53	78	106	138	173	208	242	274	302
UHET Distribution Program (e)	SFR	Indoor	0	0	0	0	20	43	66	88	108	128	148
HECW Rebates Program	SFR	Indoor	8	22	41	63	89	116	144	171	198	224	248
Cash for Grass Rebates Program (f)	SFR	Outdoor	4	9	16	23	32	46	65	85	107	129	148
Lawn Be Gone (Sheet Mulching) Program (f)	SFR	Outdoor											
Cash for Grass Rebates Program for Irrigation Accounts (g)	Irrig.	Outdoor	0	0	1	2	2	3	5	6	7	9	11
Water Smart Landscape Rebates Program	SFR	Outdoor	1	2	3	4	6	8	10	12	15	17	19
Residential WBIC Rebates Program	SFR	Outdoor	0	1	1	3	5	8	12	16	21	27	33
Commercial WBIC Rebates Program	CII	Outdoor	1	2	4	5	6	7	9	10	11	12	12
Swimming Pool Cover Rebates Program	SFR	Outdoor	0	0	0	0	0	1	2	3	4	5	6
Large Landscape Audits Program	Irrig.	Outdoor	7	14	21	31	42	48	54	60	66	74	80
Hot Water Recirculation Rebate Program	SFR	Indoor	0	0	0	0	0	0	0	0	0	1	1
Total Program Water Savings			*57*	*151*	*255*	*371*	*525*	*685*	*849*	*1,019*	*1,189*	*1,356*	*1,493*
Passive Water Savings (h)			*0*	*39*	*115*	*227*	*392*	*615*	*891*	*1,216*	*1,591*	*2,014*	*2,481*
Total Water Savings (100% Free Ridership) (i)			**36**	**130**	**266**	**442**	**680**	**969**	**1,307**	**1,699**	**2,141**	**2,627**	**3,143**
Total Water Savings (0% Free Ridership) (i)			**57**	**190**	**370**	**598**	**917**	**1,300**	**1,740**	**2,235**	**2,780**	**3,369**	**3,974**

Table 5-4
Estimated Water Savings Achieved by Conservation Programs and Passive Savings
North Marin Water District, Sonoma-Marin Saving Water Partnership



Abbreviations

CII = Commercial, Industrial, Institutional
HET = High Efficiency Toilet
HECW = High Efficiency Clothes Washer
Irrig. = Irrigation Accounts
SFR = Single-family residential
UHET = Ultra High Efficiency Toilet

Table 5-4
Estimated Water Savings Achieved by Conservation Programs and Passive Savings
North Marin Water District, Sonoma-Marin Saving Water Partnership

Notes

(a) Predominant sector for program participants.
(b) Water savings are estimated per the AWE model.
(c) The water savings associated with the retrofit on resale (dwellings certified) program, the residential new development sign-offs program, and the commercial new development sign-offs program are estimated as passive savings.
(d) The HET rebate program includes the residential sector and the CII sector.
(e) The total number of toilets distributed is not available. Therefore, for water savings estimation purposes, it is assumed that each participant received 1.7 toilets on average, which is based on the average number of toilets replaced per HET rebate participant.
(f) The water savings for the cash for grass rebates program and the lawn be gone (sheet mulching) program are combined for purposes of this assessment.
(g) Annual breakdown of turf removal square footage is not available for the cash for grass rebates program for irrigation accounts. Thus, it is assumed that the annual turf area removed was the same.
(h) Passive water savings are water savings associated with the natural change out of water using fixtures and devices with higher efficiency ones, due to plumbing code and market changes. Passive savings are estimated for the whole service area.
(i) Free ridership refers to customers who participate in a conservation program, but who would have taken the water saving action (e.g., replace a toilet) regardless of whether the conservation program incentive was available. The amount of free ridership is unknown, and thus a range is shown. Free ridership is applied to device, hot water recirculation systems, and turf replacement programs only.

Sources

1. North Marin Water District, 2020. Program Participation Data, provided by North Marin Water District on 8 April 2020 and 28 April 2020.

Table 5-6a
Estimated Water Savings Achieved by the HECW Rebate Program
North Marin Water District, Sonoma-Marin Saving Water Partnership

Year	Number of Participants (a)	Total HECW Rebated (unit)	Total Rebate Amount ($)	Average Water Use Reduction (b)		Estimated Savings due to Program (d) (gal/acct/yr)	Estimated Unit Savings (gal/yr/unit)
				Participant Group (gal/yr)	Cohort Group (c) (gal/yr)		
2010	325	325	$24,499	19,113	14,250	4,863	4,863
2011	251	251	$16,024	13,082	7,465	5,617	5,617
2012	164	164	$8,200	14,914	5,970	8,944	8,944
2013	222	222	$11,100	18,339	16,996	1,344	1,344
2014	130	130	$6,500	28,071	25,434	2,636	2,636
2015	79	79	$3,950	28,046	19,018	9,029	9,029
2016	46	46	$2,300	14,578	5,914	8,664	8,664
2017	15	15	$750	-3,683	-15,869	12,186	12,186
Total	**1,232**	**1,232**	**$73,323**	**--**	**--**	**--**	**--**
Avg (e)	**--**	**--**	**--**	**16,558**	**9,897**	**5,189**	**5,189**

Abbreviations:

avg = average
gal/acct/yr = gallons per account per year
gal/yr/unit = gallons per year per unit device rebated
gal/yr = gallons per year
HECW = high efficiency clothes washer
-- = not applicable

Notes:

(a) Program participants included in this analysis are limited to those that: (1) have only participated in the specified program, (2) have only participated in the program in the specified year, and (3) have sufficient water use data within the study periods.
(b) A negative value indicates that average water use increased following program participation.
(c) Customers included in the comparison cohort groups are limited to those that: (1) have not participated in any water efficiency program based on available data and (2) have sufficient water use data within the study periods.
(d) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts. Water savings comparison cohorts for all customers are stratified geographically based on Census Block Groups.
(e) The estimated savings are the weighted averages based on the number of participants. Water use reduction averages are not weighted.

Sources:

1. North Marin Water District, 2020. 2010-2019 MonthlyWaterByService2004_2019RawData.xlsx, provided by North Marin Water District on 14 May 2020.

Table 5-6b
Estimated Water Savings Achieved by the HET Rebate Program
North Marin Water District, Sonoma-Marin Saving Water Partnership

Year	Number of Participants (a)	Total HET Rebated (unit)	Total Rebate Amount ($)	Average Water Use Reduction (b)		Estimated Savings due to Program (d) (gal/acct/yr)	Estimated Unit Savings (gal/yr/unit)
				Participant Group (gal/yr)	Cohort Group (c) (gal/yr)		
2010	150	257	$37,371	17,036	11,439	5,598	3,267
2011	118	191	$23,372	8,078	5,936	2,142	1,323
2012	76	145	$12,201	16,861	5,072	11,789	6,179
2013	90	158	$15,595	22,540	14,917	7,623	4,342
2014	124	204	$20,279	25,076	20,905	4,171	2,536
2015	111	193	$18,982	23,613	17,438	6,176	3,552
2016	79	141	$13,838	17,323	7,502	9,821	5,503
2017	56	83	$8,273	-11,469	-14,293	2,824	1,906
Total	**804**	**1,372**	**$149,911**	**--**	**--**	**--**	**--**
Avg (e)	**--**	**--**	**--**	**14,882**	**8,614**	**5,984**	**3,429**

Abbreviations:

avg = average
gal/acct/yr = gallons per account per year
gal/yr/unit = gallons per year per unit device rebated
gal/yr = gallons per year
HET = high efficiency toilet
-- = not applicable

Notes:

(a) Program participants included in this analysis are limited to those that: (1) have only participated in the specified program, (2) have only participated in the program in the specified year, and (3) have sufficient water use data within the study periods.
(b) A negative value indicates that average water use increased following program participation.
(c) Customers included in the comparison cohort groups are limited to those that: (1) have not participated in any water efficiency program based on available data and (2) have sufficient water use data within the study periods.
(d) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts. Water savings comparison cohorts for all customers are stratified geographically based on Census Block Groups.
(e) The estimated savings are the weighted averages based on the number of participants. Water use reduction averages are not weighted.

Sources:

1. North Marin Water District, 2020. 2010-2019 MonthlyWaterByService2004_2019RawData.xlsx, provided by North Marin Water District on 14 May 2020.

Table 5-6c
Estimated Water Savings Achieved by the Cash for Grass Rebate Program
North Marin Water District, Sonoma-Marin Saving Water Partnership

Year	Number of Participants (a)	Total Turf Removed (sq ft)	Total Rebate Amount ($)	Average Water Use Reduction (b)		Estimated Savings due to Program (d) (gal/acct/yr)	Estimated Unit Savings (gal/sq ft/yr)
				Participant Group (gal/yr)	Cohort Group (c) (gal/yr)		
2010	23	20,306	$12,081	18,288	13,339	4,949	5.6
2011	25	20,101	$10,314	18,565	6,434	12,132	15
2012	11	6,990	$3,501	14,960	9,260	5,700	9.0
2013	22	19,430	$7,049	25,324	14,875	10,449	12
2014	54	48,976	$17,234	45,096	26,267	18,829	21
2015	78	86,858	$32,601	30,457	17,152	13,305	12
2016	39	30,753	$13,137	9,382	3,893	5,490	7.0
2017	16	14,513	$5,373	-11,418	-16,987	5,570	6.1
Total	**268**	**247,927**	**$101,289**	--	--	--	--
Avg (e)	--	--	--	**18,832**	**9,279**	**11,446**	**12**

Abbreviations:

avg = average
gal/acct/yr = gallons per account per year
gal/sq ft/yr = gallons per square foot per year
gal/yr = gallons per year
sq ft = square foot
-- = not applicable

Notes:

(a) Program participants included in this analysis are limited to those that: (1) have only participated in the specified program, (2) have only participated in the program in the specified year, and (3) have sufficient water use data within the study periods.
(b) A negative value indicates that average water use increased following program participation.
(c) Customers included in the comparison cohort groups are limited to those that: (1) have not participated in any water efficiency program based on available data and (2) have sufficient water use data within the study periods.
(d) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts. Water savings comparison cohorts for all customers are stratified geographically based on Census Block Groups.
(e) The estimated savings are the weighted averages based on the number of participants. Water use reduction averages are not weighted.

Sources:

1. North Marin Water District, 2020. 2010-2019 MonthlyWaterByService2004_2019RawData.xlsx, provided by North Marin Water District on 14 May 2020.

Table 5-6d
Estimated Water Savings Achieved by the WBIC Rebate Program
North Marin Water District, Sonoma-Marin Saving Water Partnership

Year	Number of Participants (a)	Total WBIC Rebated (unit)	Total Rebate Amount ($)	Average Water Use Reduction (b)		Estimated Savings due to Program (d) (gal/acct/yr)	Estimated Unit Savings (gal/yr/WBIC)
				Participant Group (gal/yr)	Cohort Group (c) (gal/yr)		
2010	2	2	$400	62,084	-78,501	140,585	140,585
2011	2	2	$1,090	45,316	237,309	-191,993	-191,993
2012	3	3	$1,780	-224,525	-97,834	-126,691	-126,691
2013	10	10	$2,035	45,429	-43,575	89,004	89,004
2014	2	2	$862	89,012	22,112	66,900	66,900
2015	4	4	$930	12,109	22,547	-10,438	-10,438
2016	3	3	$620	-9,419	6,018	-15,437	-15,437
2017	4	4	$842	10,225	-15,073	25,298	25,298
Total	**30**	**30**	**$8,558**	**--**	**--**	**--**	**--**
Avg (e)	**--**	**--**	**--**	**3,779**	**6,625**	**18,469**	**18,469**

Abbreviations:

avg = average
gal/acct/yr = gallons per account per year
gal/yr/WBIC= gallons per year per WBIC rebated
gal/yr = gallons per year
WBIC = weather-based irrigation controller
-- = not applicable

Notes:

(a) Program participants included in this analysis are limited to those that: (1) have only participated in the specified program, (2) have only participated in the program in the specified year, and (3) have sufficient water use data within the study periods.
(b) A negative value indicates that average water use increased following program participation.
(c) Customers included in the comparison cohort groups are limited to those that: (1) have not participated in any water efficiency program based on available data and (2) have sufficient water use data within the study periods.
(d) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts. Water savings comparison cohorts for all customers are stratified geographically based on Census Block Groups.
(e) The estimated savings are the weighted averages based on the number of participants. Water use reduction averages are not weighted.

Sources:

1. North Marin Water District, 2020. 2010-2019 MonthlyWaterByService2004_2019RawData.xlsx, provided by North Marin Water District on 14 May 2020.

Table 5-6e
Estimated Water Savings Achieved by the Water Smart Survey Program
North Marin Water District, Sonoma-Marin Saving Water Partnership

Year	Number of Participants (a)	Average Water Use Reduction (b)		Estimated Savings due to Program (d) (gal/acct/yr)
		Participant Group (gal/yr)	Cohort Group (c) (gal/yr)	
2010	208	26,065	14,032	12,033
2011	141	18,712	4,683	14,030
2012	122	3,903	-6,498	10,401
2013	1	-9,724	22,188	-31,912
2017	17	18,216	-14,377	32,592
Total	**489**	**--**	**--**	**--**
Avg (e)	**--**	**11,434**	**4,006**	**12,826**

Abbreviations:

avg = average
gal/acct/yr = gallons per account per year
gal/yr = gallons per year
-- = not applicable

Notes:

(a) Program participants included in this analysis are limited to those that: (1) have only participated in the specified program, (2) have only participated in the program in the specified year, and (3) have sufficient water use data within the study periods.
(b) A negative value indicates that average water use increased following program participation.
(c) Customers included in the comparison cohort groups are limited to those that: (1) have not participated in any water efficiency program based on available data and (2) have sufficient water use data within the study periods.
(d) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts. Water savings comparison cohorts for all customers are stratified geographically based on Census Block Groups.
(e) The estimated savings are the weighted average based on the number of participants. Water use reduction averages are not weighted.

Sources:

1. North Marin Water District, 2020. 2010-2019 MonthlyWaterByService2004_2019RawData.xlsx, provided by North Marin Water District on 14 May 2020.

Table 5-7
Building Stock Characteristics by Program Participants
North Marin Water District, Sonoma-Marin Saving Water Partnership

Water Efficiency Program (a)	Sector	Avg Year Built	Avg Lot Size (sq ft)	Avg Lot Size (ac)	Year of Construction		
					pre-1994	1994-2009	2010 and Later
Cash for Grass Rebate Program	SFR	1980	15,176	0.35	82%	18%	0.12%
HECW Rebate Program	SFR	1981	16,852	0.39	80%	20%	0.32%
	MFR	1988	2,269	0.05	75%	24%	0.60%
HET Rebate Program	SFR	1977	18,103	0.42	92%	8.1%	0.06%
	MFR	1984	18,298	0.42	92%	8.4%	0%
WBIC Rebate Program	SFR	1986	18,372	0.42	70%	28%	1.2%
Water Smart Survey Program	SFR	1983	23,298	0.53	75%	25%	0.17%
	MFR	1984	2,192	0.05	86%	14%	0%

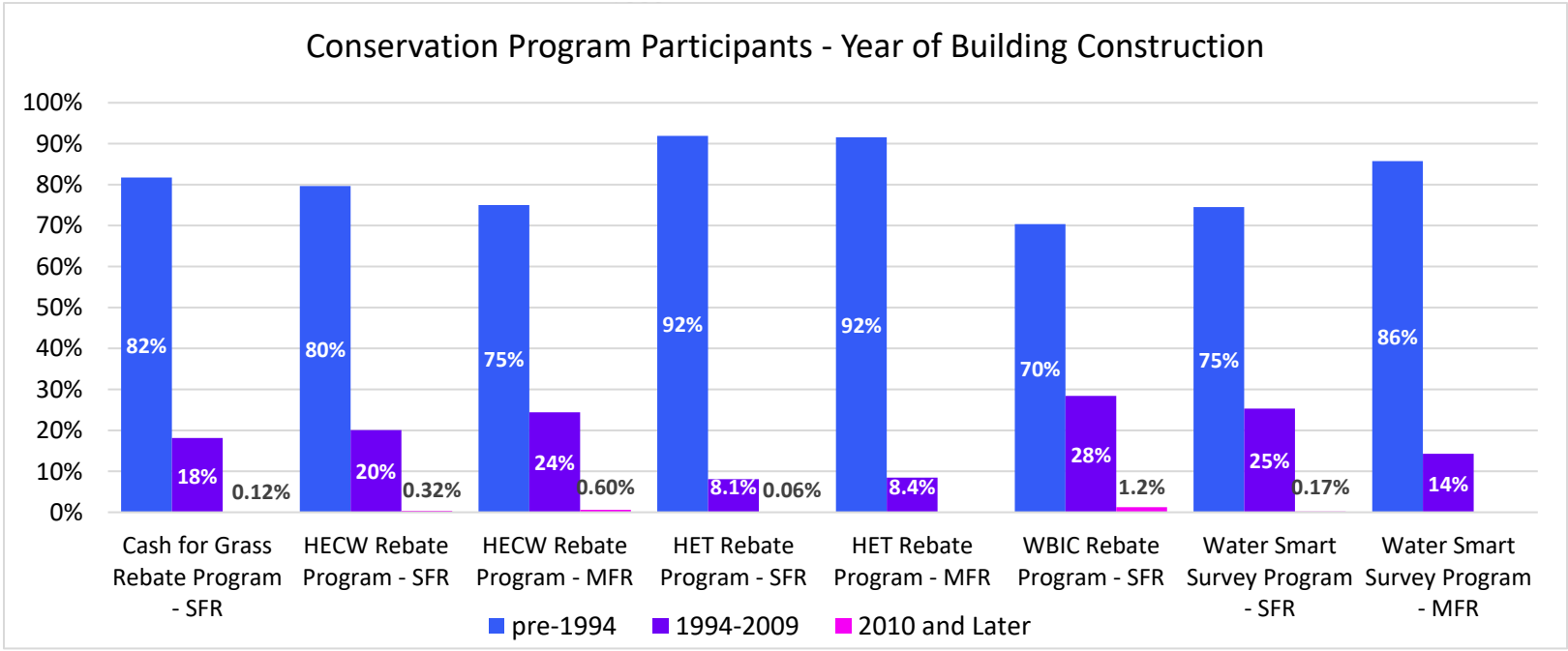
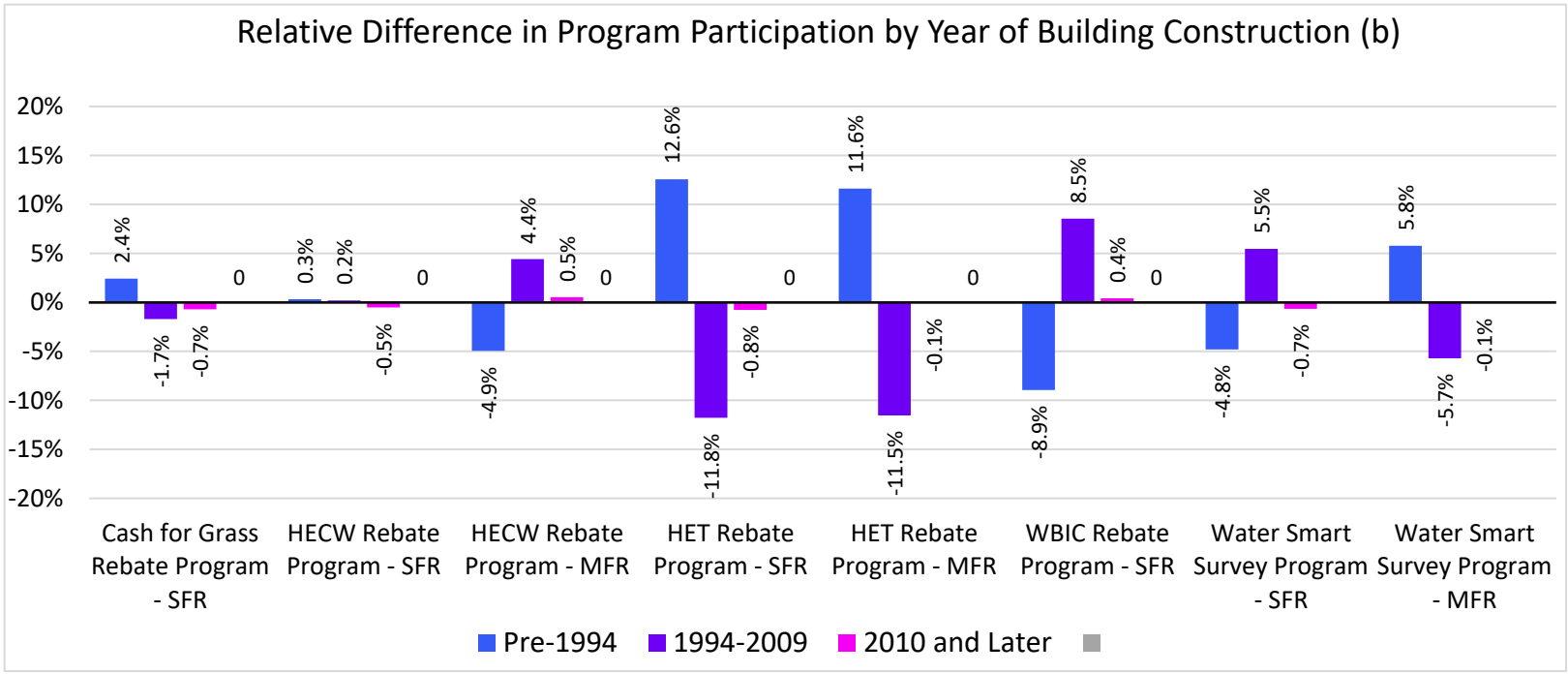


Table 5-7
Building Stock Characteristics by Program Participants
North Marin Water District, Sonoma-Marin Saving Water Partnership



Abbreviations:

ac = acre
avg = average
HECW = high efficiency clothes washer
MFR = multi-family residential
HET = high efficiency toilet
SFR = single family residential
sq ft = square feet

Table 5-7
Building Stock Characteristics by Program Participants
North Marin Water District, Sonoma-Marin Saving Water Partnership

Notes:
(a) Program participants included in this analysis are limited to those for which relevant parcel data are available. The analysis is also limited to sectors with more than 50 participants in a given program.
(b) Relative difference is calculated as the percentage of program participation by year of construction minus the overall percentage of residential customers by year of construction within the service area.

Sources:
1. Marin County, 2020. Sonoma county Assessor Parcel Data, provided via Marin Municipal Water District, 13 February 2020.

Table 5-8a
Residential Customer Program Participation by Median Household Income
North Marin Water District, Sonoma-Marin Saving Water Partnership

Median Household Income (a)		Percentage of Residential Customers in NMWD (b)	Percentage of Participating Residential Customers (b)				
			Cash for Grass Rebate Program	HECW Rebate Program	HET Rebate Program	Water Smart Survey Program	WBIC Rebate Program
Low Income	<$94,850	40%	28%	34%	39%	31%	33%
Moderate Income	$94,850 - $124,500	28%	34%	31%	29%	32%	28%
High Income	>$124,500	32%	38%	36%	31%	37%	40%

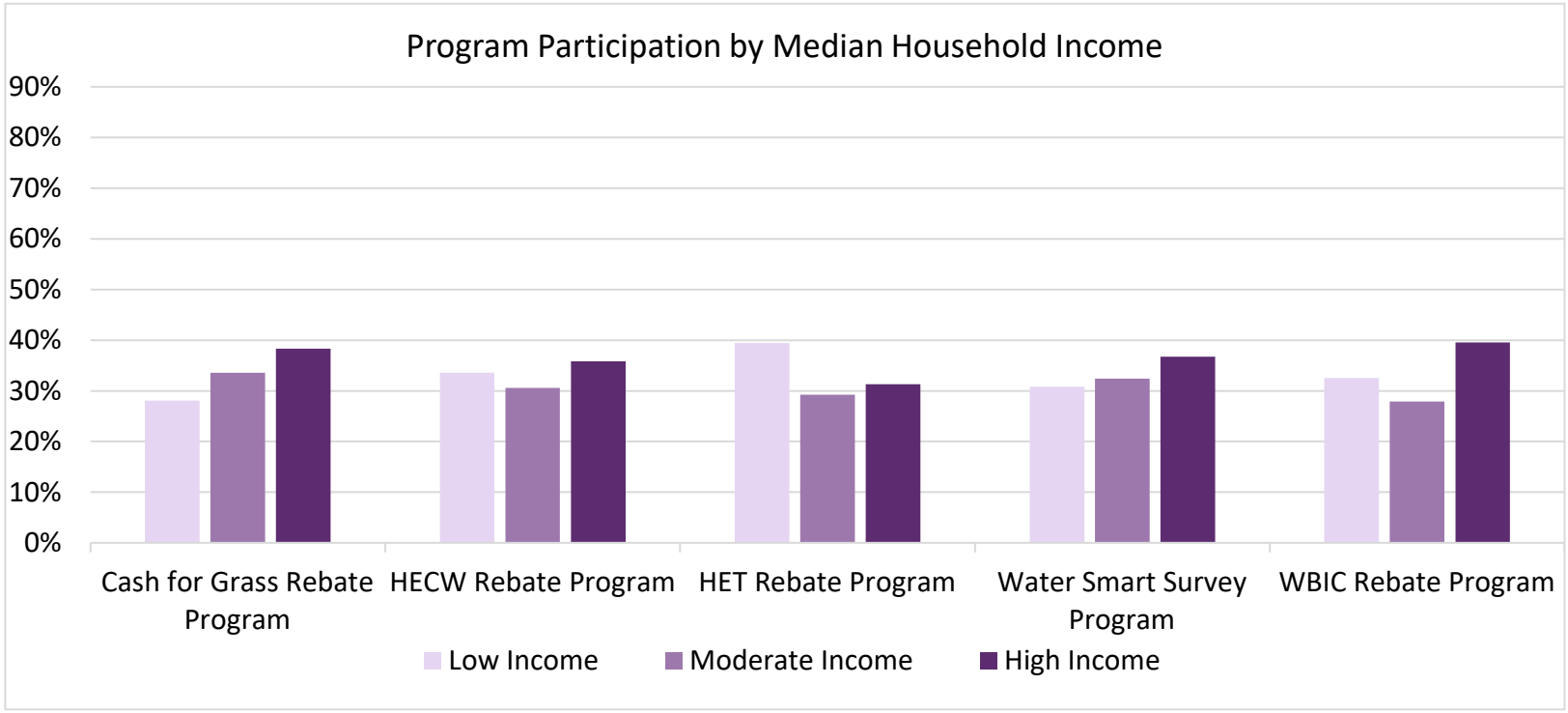
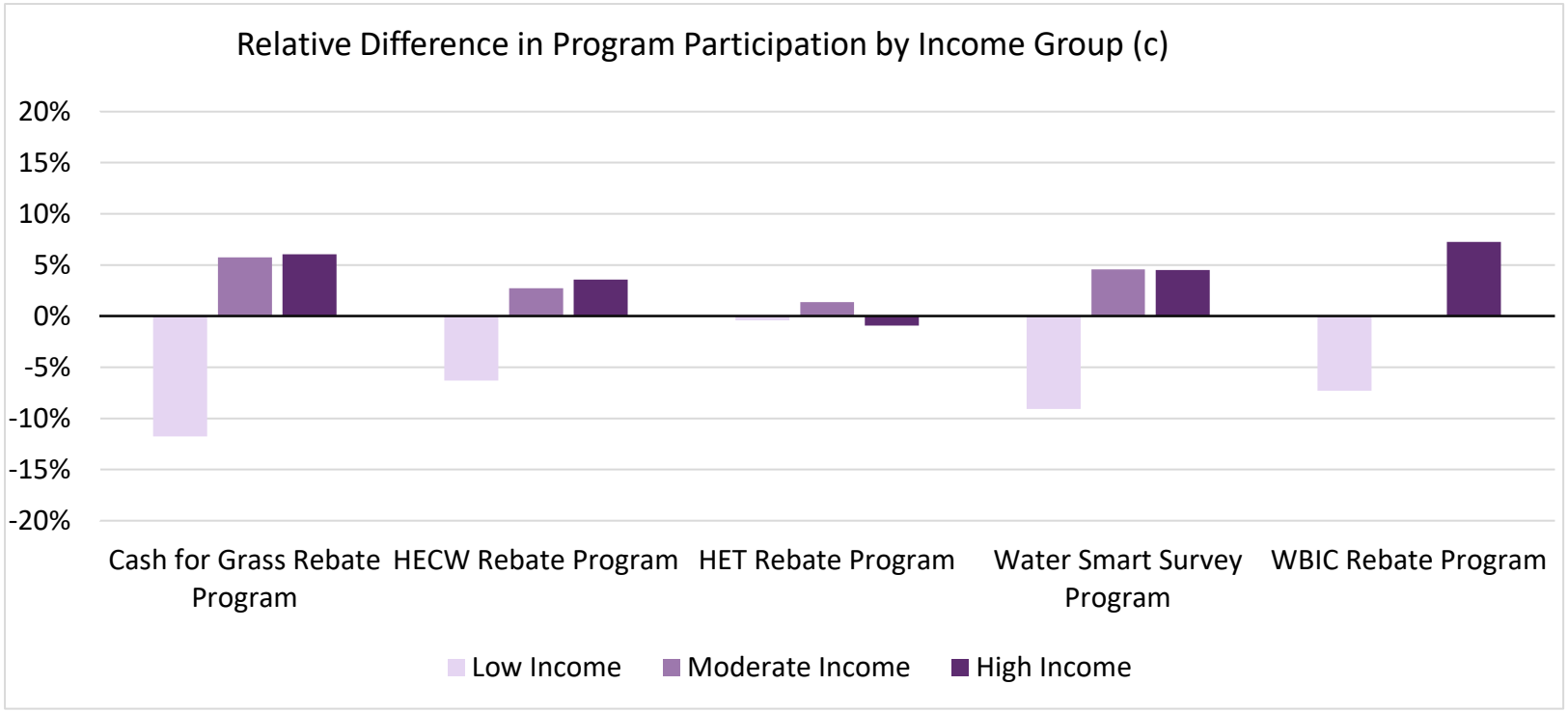


Table 5-8a
Residential Customer Program Participation by Median Household Income
North Marin Water District, Sonoma-Marin Saving Water Partnership



Abbreviations:

HECW = high efficiency clothes washer
HET = high efficiency toilet
HUD = United States Department of Housing and Urban Development
NMWD = North Marin Water District
WBIC = weather-based irrigation controller

Table 5-8a
Residential Customer Program Participation by Median Household Income
North Marin Water District, Sonoma-Marin Saving Water Partnership

Notes:
(a) Household income is based on estimated 2017 median household income by Census Block Group, per Census (2019). Income level groupings are based on California Department of Housing and Community Development ("HCD") income levels for Marin County for a 3-person household in 2017 (HCD, 2017). The average persons per household is 2.4 for Marin County, based on Census data.
(b) Residential customers include both single-family and multi-family customers. Participants included in this analysis are limited to those for which location data are available.
(c) Relative difference is calculated as the percentage of program participation by income group minus the overall percentage of residential customers by income group within the service area.

References:
1. Census, 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau, downloaded on 14 January 2020.
2. HCD, 2017. Memorandum: State Income Limits for 2017, California Department of Housing and Community Development, dated June 9, 2017.

Table 5-8b
Residential Customer Program Participation by Percentage of Renters
North Marin Water District, Sonoma-Marin Saving Water Partnership

Percentage of Renters (a)		Percentage of Residential Customers in NMWD (b)	Percentage of Participating Residential Customers (b)				
			Cash for Grass Rebate Program	HECW Rebate Program	HET Rebate Program	Water Smart Survey Program	WBIC Rebate Program
Low Rentership	≤25%	63%	81%	70%	69%	75%	77%
Low to Moderate Rentership	25.1%-50%	23%	14%	21%	16%	17%	17%
Moderate to High Rentership	50.1%-75%	11%	4.6%	7.3%	12%	6.3%	5.8%
High Rentership	≥75%	3.0%	0.44%	1.8%	3.0%	1.4%	0%

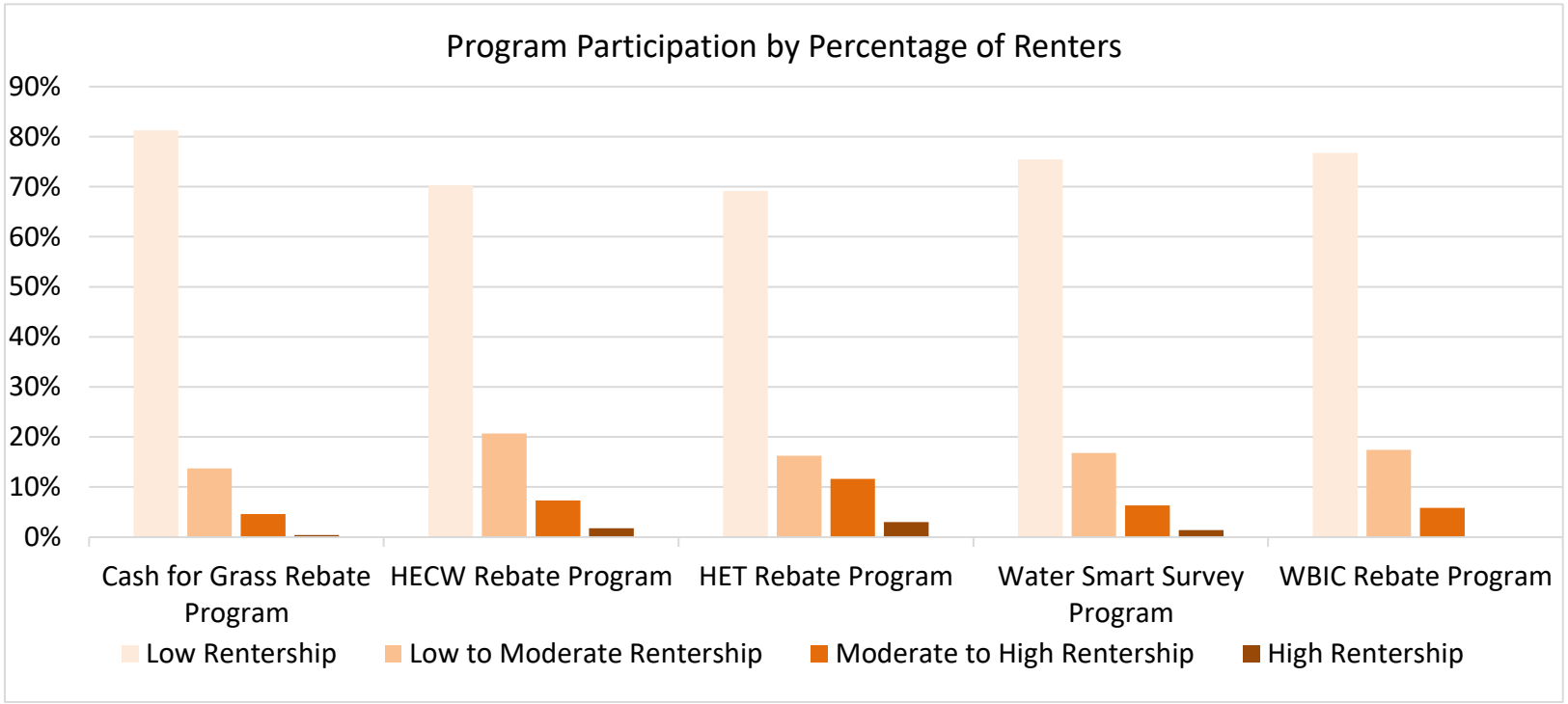
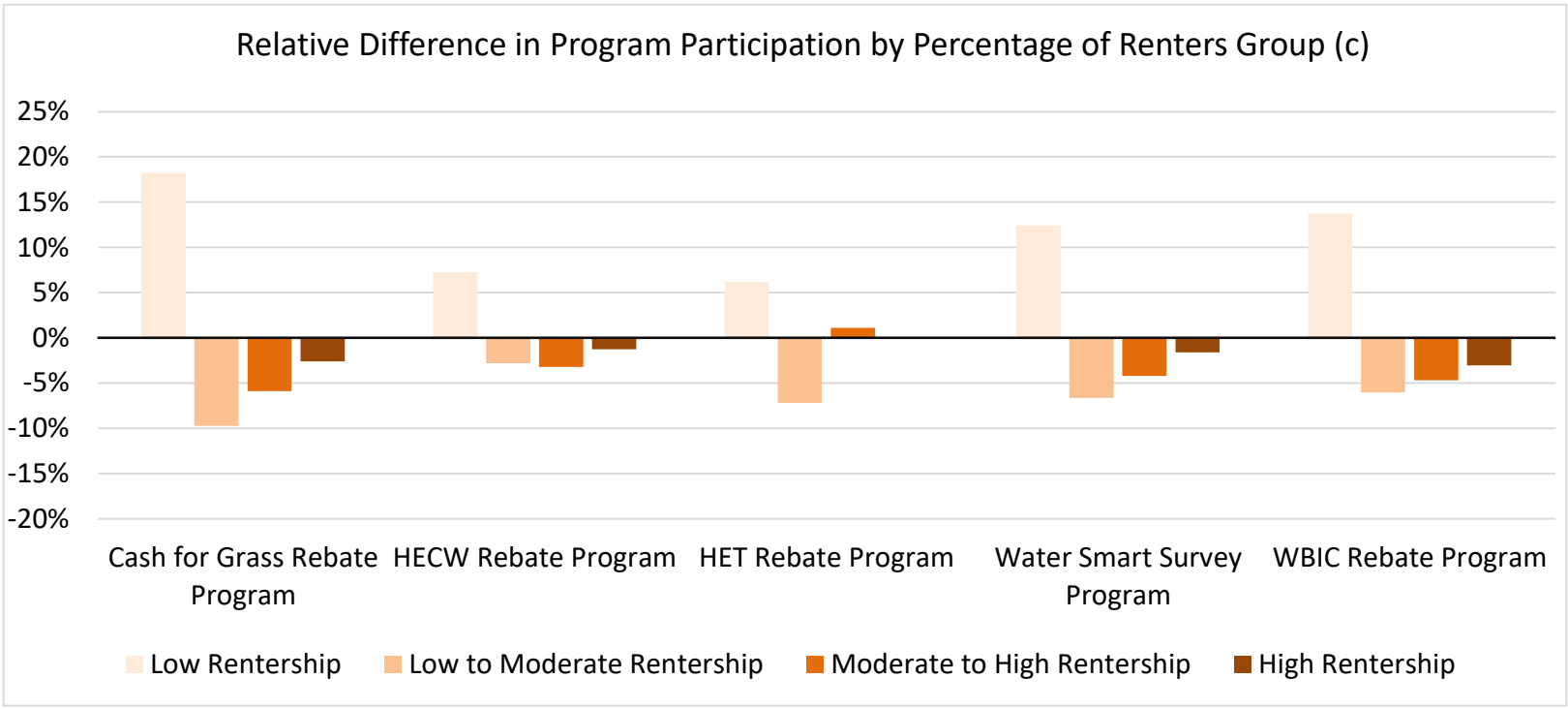


Table 5-8b
Residential Customer Program Participation by Percentage of Renters
North Marin Water District, Sonoma-Marin Saving Water Partnership



Abbreviations:

HECW = high efficiency clothes washer
HET = high efficiency toilet
NMWD = North Marin Water District
WBIC = weather-based irrigation controller

Table 5-8b
Residential Customer Program Participation by Percentage of Renters
North Marin Water District, Sonoma-Marin Saving Water Partnership

Notes:

(a) Percent rentership reflects the proportion of population within a given Census Block Group that lives in renter-occupied homes. Low rentership indicates an area consists predominantly of owner-occupied homes; high rentership indicates an area consists predominantly of renter-occupied homes. Rentership is based on estimated percentage of rentership by Census Block Group, per Census (2019).

(b) Residential customers include both single-family and multi-family customers. Participants included in this analysis are limited to those for which location data are available.

(c) Relative difference is calculated as the percentage of program participation by percent of renters group minus the overall percentage of residential customers by percent of renters group within the service area.

References:

1. Census, 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau, downloaded on 14 January 2020.

Table 5-8c
Residential Customer Program Participation by Median Household Age
North Marin Water District, Sonoma-Marin Saving Water Partnership

Median Household Age (a)	Percentage of Residential Customers in NMWD (b)	Percentage of Participating Residential Customers (b)				
		Cash for Grass Rebate Program	HECW Rebate Program	HET Rebate Program	Water Smart Survey Program	WBIC Rebate Program
<35 Years	4.1%	1.6%	3.3%	4.3%	2.8%	4.7%
35-45 Years	28%	26%	29%	24%	23%	16%
45-55 Years	58%	61%	57%	59%	61%	57%
>55 Years	9.8%	12%	9.8%	13%	13%	22%

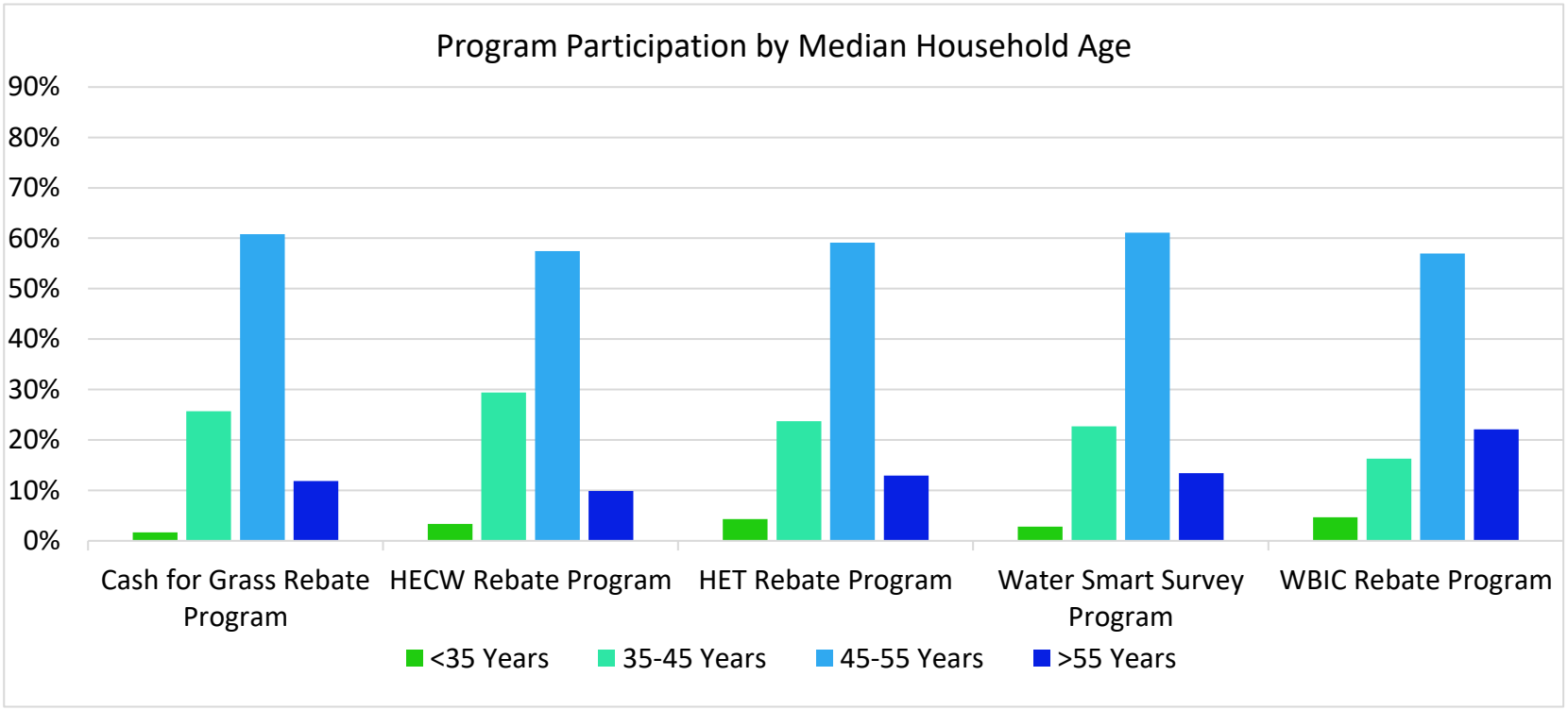
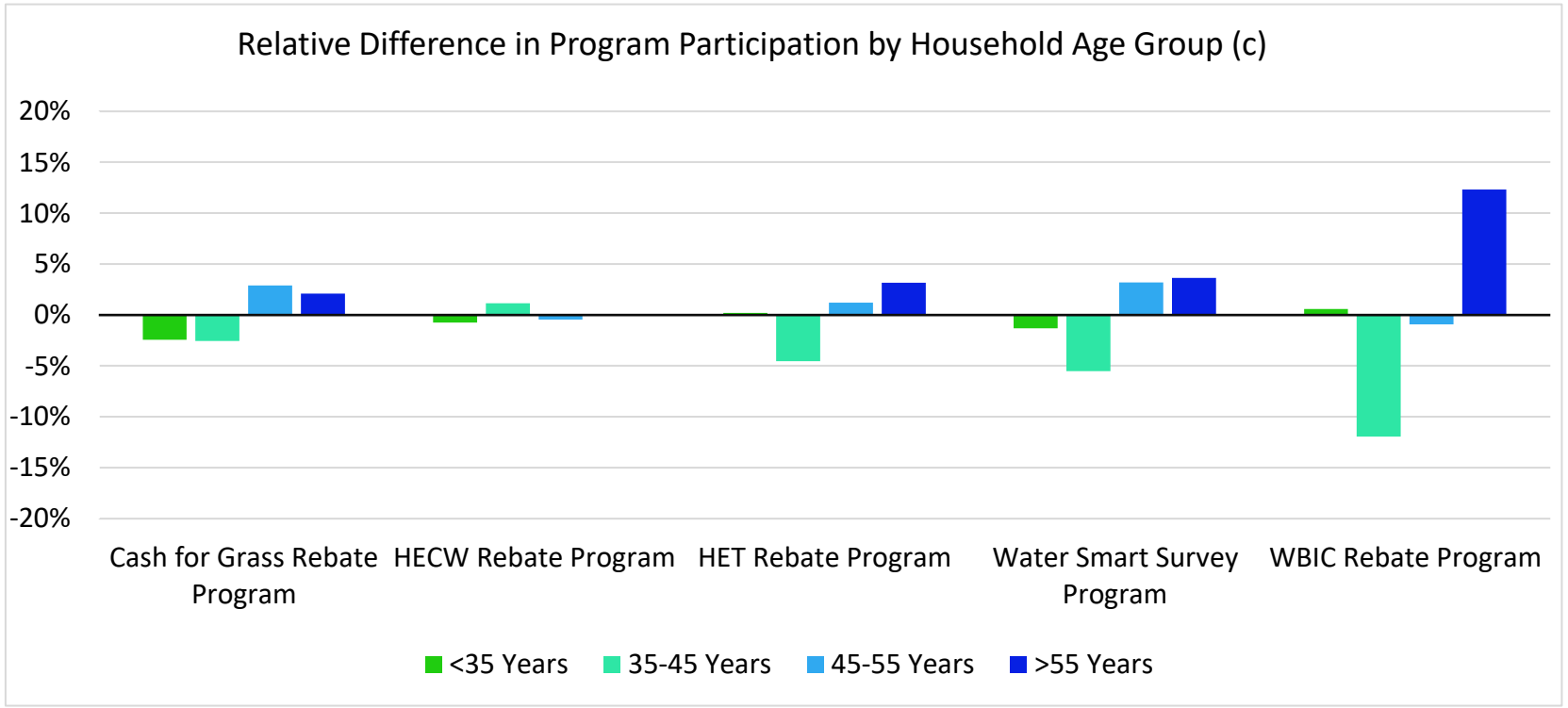


Table 5-8c
Residential Customer Program Participation by Median Household Age
North Marin Water District, Sonoma-Marin Saving Water Partnership



Abbreviations:

HECW = high efficiency clothes washer
HET = high efficiency toilet
NMWD = North Marin Water District
WBIC = weather-based irrigation controller

Table 5-8c
Residential Customer Program Participation by Median Household Age
North Marin Water District, Sonoma-Marin Saving Water Partnership

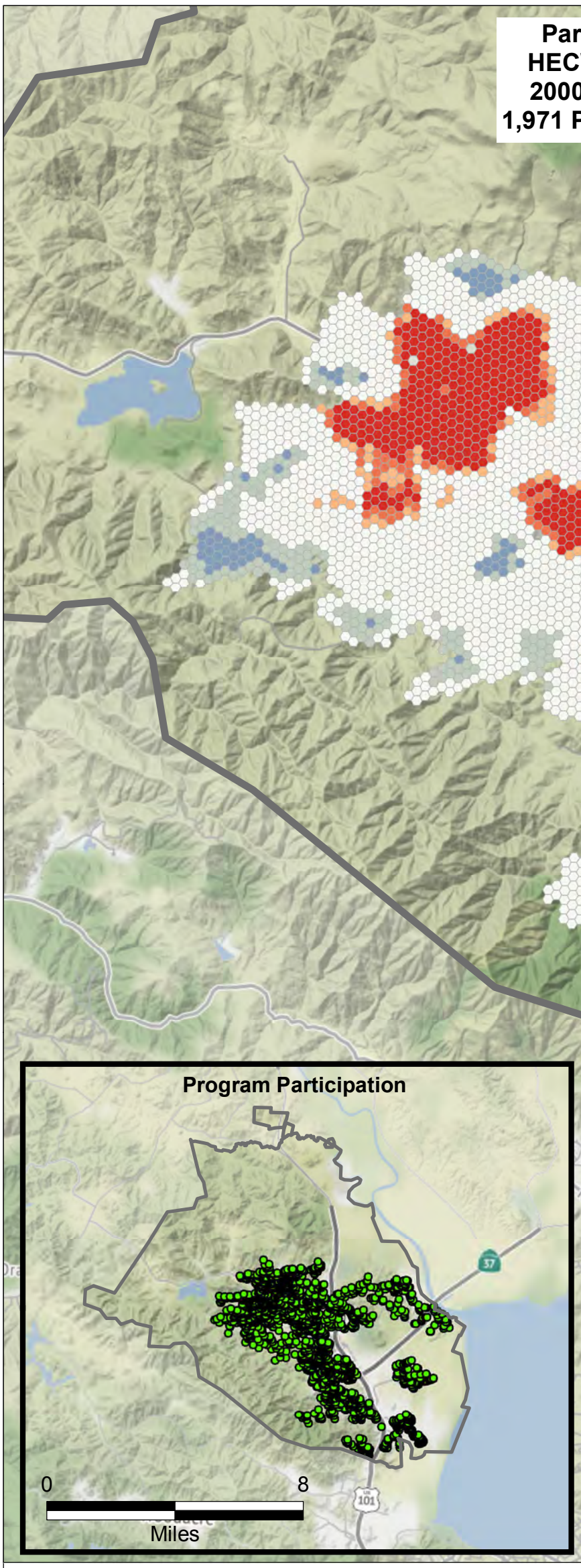
Notes:

(a) Median household age is based on the estimated median age of household members by Census Block Group, per Census (2019).
(b) Residential customers include both single-family and multi-family customers. Participants included in this analysis are limited to those for which location data are available.
(c) Relative difference is calculated as the percentage of program participation by household age group minus the overall percentage of residential customers by household age group within the service area.

References:

1. Census, 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau, downloaded on 14 January 2020.

Participation Density
HECW Rebate Program
2000, 2006, 2009 - 2020
1,971 Participants Analyzed



Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program Participation

- HECW Rebate Program
- Service Area Boundary

Abbreviation

HECW = high efficiency clothes washer

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.

Sources

1. Water use efficiency program data provided by North Marin Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

N

0 1 2

Miles

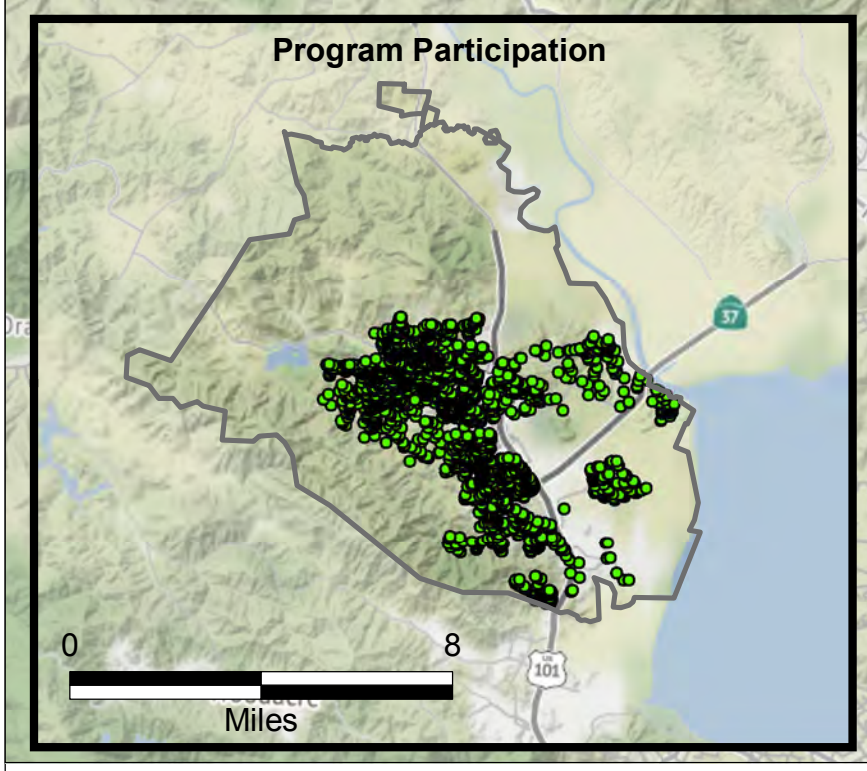
Participation Density for HECW Rebate Program

North Marin Water District, CA
December 2020
C00004.00

Figure 5-1a

Path: X:\C00004_SonomaMarin\Map\2020\12\Fig5-1a_HotSpot_NMWD_HECW_20200902.mxd

Participation Density
HET Rebate Program
2005 - 2020
2,291 Participants Analyzed



Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program Participation

- HET Rebate Program
- Service Area Boundary

Abbreviation

HET = high efficiency toilet

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.

Sources

1. Water use efficiency program data provided by North Marin Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

N

0 1 2
Miles

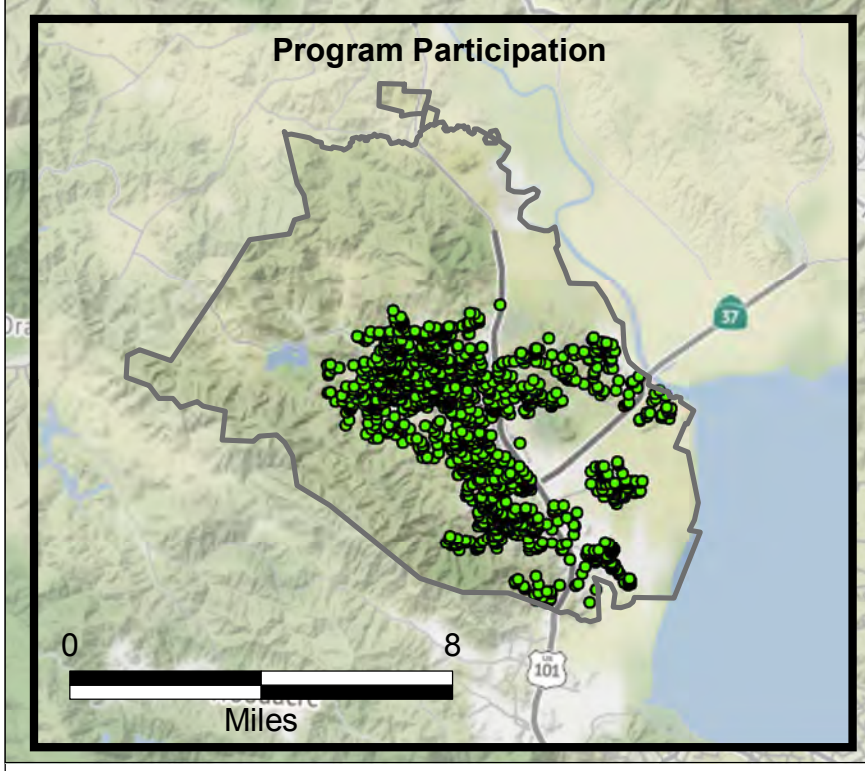
Participation Density for HET Rebate Program

North Marin Water District, CA
December 2020
C00004.00

Figure 5-1b

Path: X:\C00004_SonomaMarin\Map\2020\12\Fig5-1b_HotSpot_NMWD_HET_20200902.mxd

Participation Density
Water Smart Survey Program
2008 - 2020
1,458 Participants Analyzed



Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program Participation

- Water Smart Survey Program
- Service Area Boundary

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.

Sources

1. Water use efficiency program data provided by North Marin Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

N

0 1 2
Miles

Participation Density for Water Smart Survey Program

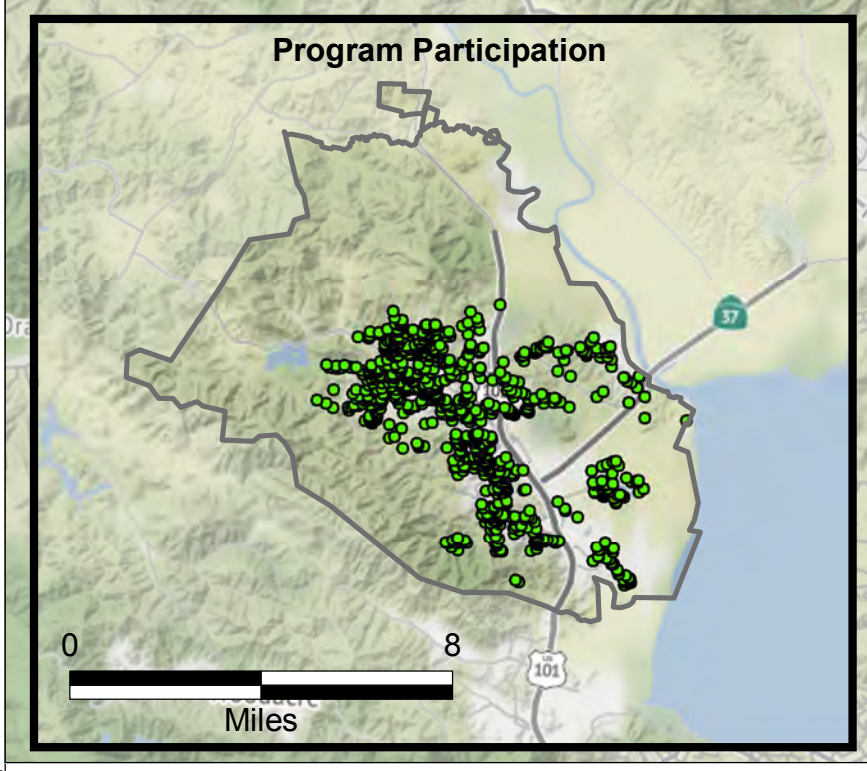
eki environment & water

North Marin Water District, CA
December 2020
C00004.00

Figure 5-1c

Path: X:\C00004_SonomaMarin\Map\2020\12\Fig5-1c_HotSpot_NMWD_WaterSmart_20200902.mxd

Participation Density
Cash for Grass Rebate Program
2000 - 2020
921 Participants Analyzed



Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program Participation

- Cash for Grass Rebate Program
- Service Area Boundary

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.

Sources

1. Water use efficiency program data provided by North Marin Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

N
0 1 2
Miles

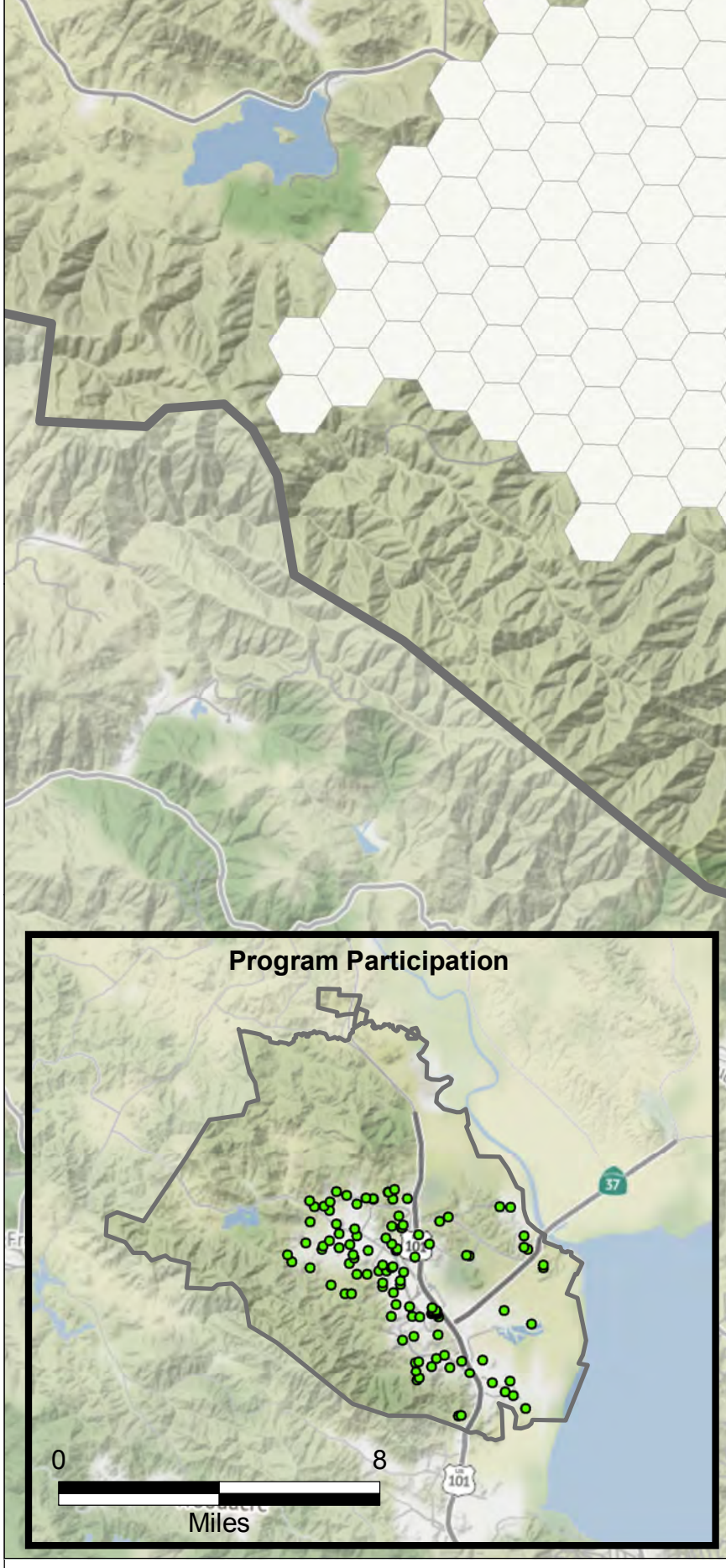
Participation Density for Cash for Grass Rebate Program

North Marin Water District, CA
December 2020
C00004.00

Figure 5-1d

Path: X:\C00004_SonomaMarin\Map\2020\12\Fig5-1d_HotSpot_NMWD_CashforGrass_20200902.mxd

Participation Density
WBIC Rebate Program
2006 - 2020
128 Participants Analyzed



Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program Participation

- WBIC Rebate Program
- Service Area Boundary

Abbreviation

WBIC = Weather-Based Irrigation Controller

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.

Sources

1. Water use efficiency program data provided by North Marin Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

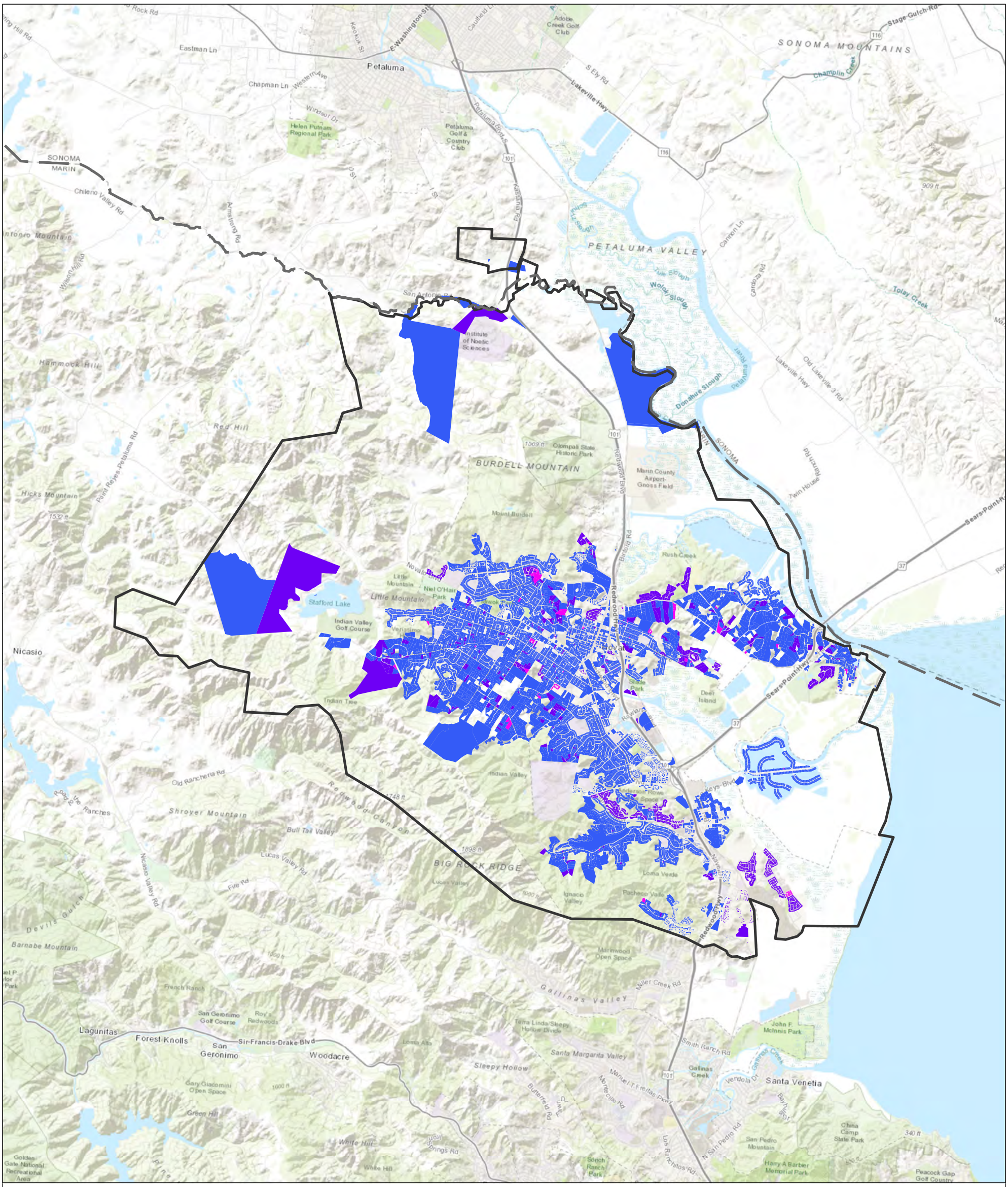
N
0 1 2
Miles

Participation Density for WBIC Rebate Program

North Marin Water District, CA
December 2020
C00004.00

Figure 5-1e

Path: X:\C00004_SonomaMarin\Map\2020\12\Fig5-1e_HotSpot_NMWD_WBIC_20200902.mxd



Legend

- Sonoma/Marin County Boundary
- Service Area Boundary

Year Built

- <1994 (16,420 parcels)
- 1994 - 2009 (2,902 parcels)
- 2010 and newer (151 parcels)

N

0 1.5 3

Miles

Notes

1. All locations are approximate.
2. Construction date for Sonoma County parcels is based on year the primary building was constructed, per Reference 1.
3. Construction date for Marin County parcels is based on year the primary building was constructed, per Reference 2.

Sources

1. Sonoma County, 2020. County Wide Parcel Data CDR_PARCEL_20200111.zip, provided by City of Santa Rosa, 12 February 2020.
2. Marin County, 2020. County Wide Parcel Data ConservationJan2020.gdb, provided by Marin Municipal Water District, 13 February 2020.
3. Basemap provided by ESRI.

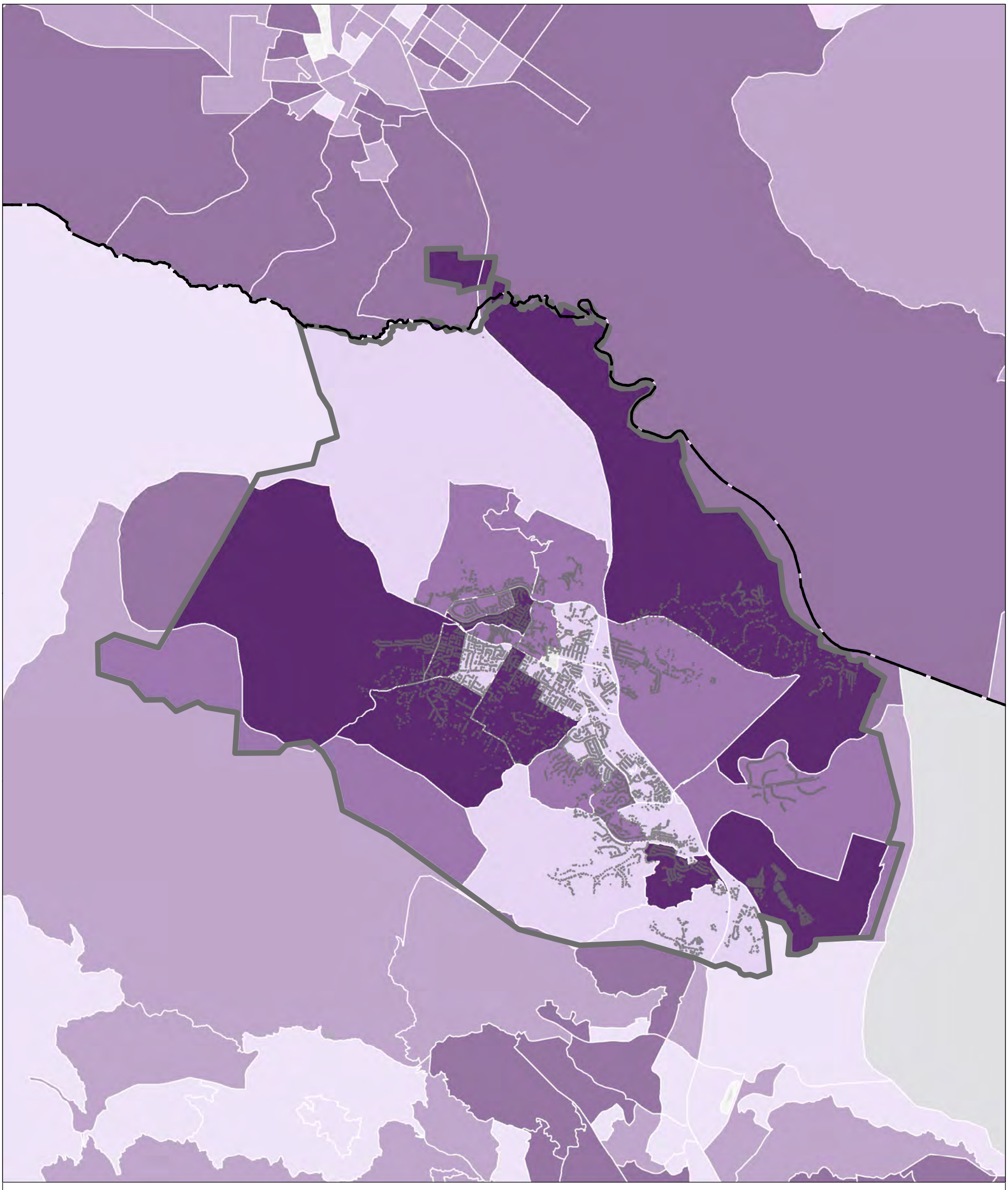
Age of Building Stock

North Marin Water District, CA
December 2020
C00004.00

Figure 5-2

eki environment & water

Path: X:\C00004_SonomaMarin\Map\2020\12\Fig5-2_NMWD_BldgStock_20201028.mxd



Legend

Sonoma County Median Household Income

- <$63,450 (Low)
- $63,450 - $90,650 (Medium)
- >$90,650 (High)

Marin County Median Household Income

- <$94,850 (Low)
- $94,850 - $124,500 (Medium)
- >$124,500 (High)

- County Boundary
- Service Area Boundary
- Residential Customers

Sources

1. Census, 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau.
2. HCD, 2017. Memorandum: State Income Limits for 2017, California Department of Housing and Community Development, dated June 9, 2017.
3. Basemap provided by ESRI.

N

0 1.5 3

Miles

Abbreviations

HUD = Housing and Community Development

Notes

1. All locations are approximate.
2. Household income is based on estimated 2017 median household income by Census Block Group, per Census (2019). Income level groupings are based on California Department of Housing and Community Development (HCD) income levels for Sonoma and Marin County for a 3-person household in 2017 (HCD, 2017). The average persons per household is 2.6 for Sonoma County and 2.4 for Marin County.

Median Household Income

eki environment & water

North Marin Water District, CA
December 2020
C00004.00
Figure 5-3a

Path: X:\C00004_SonomaMarin\Map\2020\12\Fig5-3a_NMWD_HouseholdIncome_20200916.mxd

Legend

County Boundary

Service Area Boundary

Residential Customers

Percentage of Renters

≤25%

25.1% - 50%

50.1% - 75%

≥75%

N

0 1.5 3

Miles

Notes

1. All locations are approximate.
2. Percentage of renter-occupied housing units is based on the estimated 2017 number of renter-occupied housing units by Census Block Group, per Census (2019).

Sources

1. Census 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau.
2. Basemap provided by ESRI.

Percentage of Renters

eki environment & water

North Marin Water District, CA
December 2020
C00004.00
Figure 5-3b

Path: X:\C00004_SonomaMarin\Map\202012\Fig5-3b_NMWD_PercentRenters_20200916.mxd

Legend

County Boundary

Service Area Boundary

Residential Customers

Median Household Age

<35

35 - 45

45 - 55

>55

N

0 1.5 3

Miles

Notes

1. All locations are approximate.
2. Household age is based on estimated 2017 median age of household members by Census Block Group, per Census (2019).

Sources

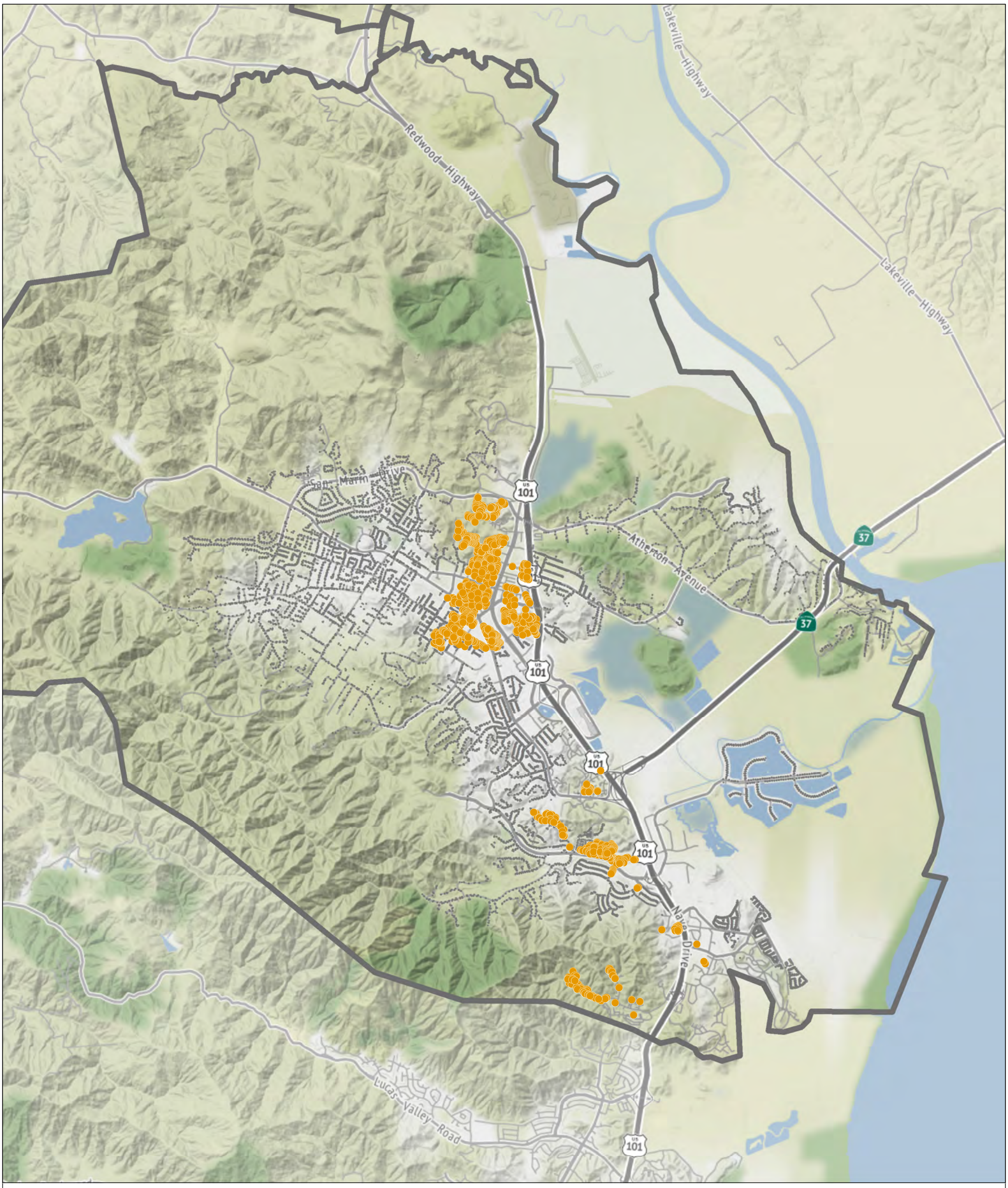
1. Census 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau.
2. Basemap provided by ESRI.

Median Household Age

North Marin Water District, CA
December 2020
C00004.00
Figure 5-3c

eki environment & water

Path: X:\C00004_SonomaMarin\Map\202012\Fig5-3c_NMWD_HouseholdAge_20200916.mxd



Legend

- All SFR Customers
- SFR Customers to Potentially Target with Outreach (1,399 customers)

Abbreviations

SFR = single family residential

Notes

1. All locations are approximate.
2. SFR customers to potentially target with outreach for the Cash for Grass Program are identified as those (1) outside areas of high participation, (2) within low income household areas, and (3) within areas of at least 25% rentership.

Sources

1. Water use efficiency program data provided by North Marin Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

N

0 1 2

Miles

SFR Customers to Potentially Target with Cash For Grass Program Outreach

North Marin Water District, CA
December 2020
C00004.00

Figure 5-4

eki environment & water

Path: X:\C00004_SonomaMarin\Map\2020\12\Fig5-4_NMWD CashforGrass_Targeting.mxd

6. CONSERVATION PROGRAM UPDATE

The following section evaluates current and potential conservation programs for both the District and the SMSWP. The purpose of this section is to compile programs that are prioritized by both the District and by all Water Contractors in the SMSWP collectively in order to calculate the potential water savings and economic feasibility of those programs. Section 6.1 discusses the methodology used to prioritize conservation programs. Section 6.2 describes the programs given high priority for implementation by all nine Water Contractors collectively, and Section 6.3 describes programs given high priority by the District. Section 6.4 analyzes the potential water savings and cost-benefit for those programs selected by the District as both individual programs and in three implementation scenarios. By assessing the feasibility of these programs, the District can make more informed decisions regarding program selection and implementation.

6.1. Methodology for Screening of Potential Water Conservation Programs

In order to evaluate the potential for new conservation programs, a comprehensive list of over 100 conservation programs was developed (**Appendix D**). Each of the nine Water Contractors were first asked to review and identify any additional programs to add to this list. Following receipt of feedback from the Water Contractors, each Water Contractor was asked to review the list and identify:

- Priority (on a scale of 1 to 5, with 5 being the highest priority) as a program to be implemented regionally through the SMSWP;
- Priority (on a scale of 1 to 5, with 5 being the highest priority) as a program to be implemented locally through their organization;
- Preference for the program to be implemented either regionally or locally; and
- Whether each program is currently or has previously been implemented by their organization.

The list of water conservation programs is organized into four categories, specifically: (1) retailer actions and water rates, (2) public outreach and education, (3) device-based and financial incentive programs, and (4) policies and regulations. The results of the water conservation program prioritization and screening are summarized for all Water Contractors combined, representing overall regional priorities and preferences (**Table 6-1**), and for each individual Water Contractor, representing each retailer's local priorities and preferences. **Table 6-1** shows the average prioritization ranking for all Water Contractors for each program for regional and local implementation as well as the percentage of Water Contractors that prefer each program to be implemented at the local level or the regional level.[16] The results presented in **Table 6-1** are discussed below for each water conservation program category. **Table 6-2** provides the results of this screening for the North Marin Water District, including priorities and preferences for each water conservation program, and identifies the target sector, whether the program addresses indoor or outdoor water use, and the primary end use.

[16] Water Contractors were asked to provide a preference for local or regional implementation for all programs they ranked a priority score of 3 or above. Thus, the percentages of Water Contractors shown in **Table 6-1** does not sum to 100%.

6.2. Screening of Regional Conservation Measures

6.2.1. Retailer Actions and Water Rate Based Conservation Programs

Of the 15 retailer action and water rate based conservation programs included in the screening list, the Water Contractors identified the following eleven programs as high priority (average score of three or higher) to implement at the local level:

1. Install Advanced Metering Infrastructure (AMI) for High Water Users and Large Landscape Accounts
2. Install AMI in New Development
3. Customer Water Loss Reduction (AMI Leak Detection)
4. Install AMI for Existing Accounts
5. Tiered Water Rates (Conservation Pricing)
6. Water Budgeting/Monitoring for Large Landscape Accounts
7. Water Budget Based Billing for Only Irrigation Customers
8. Modification to or Implementation of Tiered Rate Conservation Pricing
9. Establish Separate Pricing Structure for Irrigation Accounts
10. Rate Structure Evaluation
11. Increase Enforcement of State Water Waste Regulations

By their nature as water retailer actions, these programs do not lend themselves to regional implementation. However, in some cases, such as the "Increase Enforcement of State Water Waste Regulations" program, there may be an opportunity to coordinate across the region at a policy or education level. For example, SB-407[17] requires older plumbing fixtures to be replaced with new, more efficient fixtures that meet current water efficiency standards; this requirement is supposed to be enforced at time of sale. If this or similar policies are being enforced differently across Water Contractor jurisdictions, it could result in confusion among customers. Thus, even for retailer action-based programs, there may be opportunity for the Water Contractors to coordinate these efforts and share staff education resources.

6.2.2. Public Outreach and Education Based Conservation Programs

Of the 11 public outreach and education-based water conservation programs included in the screening, the Water Contractors identified the following six programs as high priority (average score of three or higher), with a preference for regional implementation through SMSWP:

1. Qualified Water Efficient Landscaper (QWEL) Training
2. Public Outreach through Print & Electronic Media – Focused on Outdoor Irrigation
3. Educational Workshops
4. School Education Programs
5. Public Outreach through Print & Electronic Media – Focused on Indoor Conservation
6. Garden tour

[17] SB 407: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920100SB407

All of these programs are currently being implemented by the SMWSP. In addition to these programs, the Water Contractors also indicated that water use surveys or audits for single-family residential and CII customers were a high priority; however, the Water Contractors generally expressed a preference for these programs to be implemented locally.

6.2.3. Device and Financial Incentive Based Conservation Programs

Of the 61 device- and financial incentive- based water conservation programs included in the screening list, the Water Contractors identified the following 11 programs as high priority (average score of three or higher) to implement at either the regional or local level:

1. Landscape Conversion or Turf Removal – multi-family residential (MFR) and CII
2. Landscape Conversion or Turf Removal – single family residential (SFR)
3. High Efficiency Faucet Aerator / Showerhead Giveaway – Residential Customers
4. Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates – Large Landscape
5. Drip Irrigation Incentive for SFR
6. High Efficiency Faucet Aerator / Showerhead Giveaway – CII Customers
7. Drip Irrigation Incentive for MFR and CII
8. High Efficiency Clothes Washer Rebate – Residential
9. Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates – SFR
10. Restaurant Spray Nozzle Rebates
11. Incentivize Irrigation Equipment Upgrades – SFR

The above list includes four programs that focus on indoor water use ("High Efficiency Faucet Aerator / Showerhead Giveaway – Residential Customers", "High Efficiency Faucet Aerator / Showerhead Giveaway – CII Customers", "High Efficiency Clothes Washer Rebate – Residential," and "Restaurant Spray Nozzle Rebates"). The remaining preferred programs all focus on outdoor water use, including turf removal and methods to increase irrigation efficiency.

Of these preferred programs, the Water Contractors expressed a preference for two of the programs to be administered at a regional level rather than local level, specifically the "High Efficiency Clothes Washer Rebate – Residential" and the "Restaurant Spray Nozzle Rebates".

6.2.4. Policy and Regulation Based Conservation Programs

Of the 29 policy- and regulation- based water conservation programs included in the screening list, the Water Contractors identified the following six programs as high priority (average score of three or higher) to implement at the local level:

1. Water Waste Ordinance
2. Require Submetering of Landscaping for New MFR and Commercial Developments
3. Require Water Efficiency Plan Reviews for New CII Development
4. Require High Efficiency Clothes Washers in New Development
5. Require Weather Adjusting Smart Irrigation Controllers, Rain Sensors, and/or Soil Moisture Sensors in New Development
6. Demand Offset/Water Neutral Policy for Large New Developments

Nearly all of the highest priority programs focus on ensuring efficiency in new developments, and target both indoor and outdoor water use. The Water Contractors expressed that the program "Require Irrigation Designers / Installers be Certified (QWEL)" is a high priority at the local level but were split equally as to whether they would prefer this program to be implemented at a local or regional level. Further, given the shift in state policy regarding recycled water use (i.e., that non-potable use of recycled water use will no longer be counted towards water conservation), some Water Contractors were conflicted as to how recycled water should be considered in policies regarding new development, in particular with respect to the program "Demand Offset/Water Neutral Policy for Large New Development."

6.2.5. Regional Program Screening Findings

With some exceptions, the Water Contractors expressed a strong preference for water conservation programs to be implemented locally rather than regionally through the SMSWP, with the exception of programs that are already implemented regionally by the SMSWP. However, as listed above, there was general consensus among Water Contractors about which water conservation programs are a high priority, and thus important for the region. Given this consensus, while there is not an apparent desire to implement programs regionally, there may be opportunity for further coordination and collaboration on these programs, such as sharing of educational resources, training of staff (e.g., building permit and plan review staff), and collaboration on creating similar program structure and requirements (such as for financial incentive-based programs) across the region.

6.3. Screening of Local Conservation Measures

Table 6-2 shows the results of this screening for the North Marin Water District, and lists the programs considered by the District to be medium or high priority to consider for the future. **Table 6-2** also identifies the target sector, whether the program addresses indoor or outdoor water use, and the primary targeted end use.

- **Retailer Actions and Water Rate Based Conservation Programs.** Twelve retailer action and water rate based conservation programs were identified for potential future implementation. Of these, nine are existing programs or actions currently implemented by the District, and three are potential new programs for consideration (i.e., "Water Budget Based Billing for Only Irrigation Customers", "Regional ultra high efficiency toilets (UHET) and/or Urinal Bulk Purchase Program", and "Water Budget Based Billing for All Customers"). With the exception of "Regional UHET and/or Urinal Bulk Purchase Program", all programs were given a preference for local implementation. Two programs target indoor end uses, three target outdoor end uses, and seven target both.

- **Public Outreach and Education Based Conservation Programs.** The District ranked seven public outreach and education-based water conservation programs as medium to high priority for potential future implementation, with Water Use Surveys/Audits - SFR as the highest priority. Only two of the seven selected programs are currently implemented by the district, most of which were given no preference for implementation scale. Two programs target indoor water end uses, three target outdoor end uses, and two target both. The SMWSP currently implements a variety of public education and outreach programs that are available to school age children, adults, and landscape professionals. The only additional program identified as high priority by the District is

expanding the Water Use Surveys/Audits to CII customers. The potential new programs identified are as follows, in general order of priority:

  - Water Use Surveys/Audits – CII
  - Public Outreach through Print & Electronic Media - Focused on Outdoor Irrigation
  - Educational Workshops
  - Public Outreach through Print & Electronic Media - Focused on Indoor Conservation
  - Provide Support with Smart Irrigation Controller Setup

- **Device and Financial Incentive Based Conservation Programs.** Twenty-two device and financial incentive based programs were ranked as medium to high priority for potential future implementation, including seven that would target indoor water end uses and fifteen that would target outdoor water end uses. Three of these programs are not currently implemented by the District, identified are as follows in general order of priority:

  - Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - Large Landscape
  - Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway – SFR
  - Plumber Initiated UHET and / or Urinal Retrofit Program

- **Policy and Regulation Based Conservation Programs.** Thirteen policy and regulation based programs were identified as highest priority for potential future implementation, eight of which are currently implemented by the District and five of which would be new programs. Seven programs target indoor water end uses and six target outdoor end uses. All programs were given a preference for local implantation. The potential new programs identified are as follows, in general order of priority:

  - Require Submetering for New Mobile Home Park Developments
  - Require Submetering for New MFR Developments
  - Require Irrigation Designers / Installers be Certified (QWEL)
  - Require Hot Water on Demand / Structured Plumbing in New Residential Development
  - Require <1.0 gal/flush Toilets in New Development

6.4. Evaluation of Future Water Conservation Programs

Based on the conservation screening process described in Sections 6.2 and 6.3 above, a suite of conservation programs to be considered for future implementation were evaluated. These programs were evaluated both individually and as components in three water conservation program scenarios, as shown in **Table 6-3a**. The three program scenarios represent three potential approaches or strategies for the District's future conservation programs, specifically:

- **Scenario A** represents a focus on programs that target outdoor water savings,
- **Scenario B** represents a more "business as usual" approach based on programs ranked most highly by the District, and
- **Scenario C** represents a focus on the programs that all nine Water Contractors collectively identified as highest priority.

Table 6-3a also identifies the customer sectors each program would target as well as whether the program focuses on indoor or outdoor water use, or both.

The benefits and costs associated with implementation of these programs were evaluated using the AWE model, using a series of assumptions documented in **Appendix B**.[18] Key assumptions and considerations related to the methodology used by the AWE model and in this analysis are provided below:

- Financial assumptions related to both costs to the utility and customer water rates were provided by the District.
- Financial assumptions related to energy costs to the customer were assumed based on typical PG&E rates (PG&E, 2020; PG&E and Marin Clean Energy, 2020).
- Water savings assumptions were based on a combination of District-specific water savings estimates per Section 5.3.2, AWE model default assumptions, assumptions developed for the District as a part of the 2015 conservation modeling per NMWD (2015), and water savings factors developed based on other published literature sources.
- Assumed rate of program implementation was based on historical participation levels by District customers in similar programs.
- For purposes of near-term conservation program analysis, it is assumed that all programs are active from 2021 through 2025; water savings projections beyond this period reflect cumulative savings achieved over time from implementation during this five-year period.
- Benefit-costs ratios are particularly sensitive to the assumed nominal rate of increase of the utility water cost.
- Lost revenue due to reduced water sales is not included as a cost.
- Additional program-specific considerations are provided as notes in the attached tables.

Table 6-3b presents a comparison of individual water conservation measures, and identifies the following information for each program:

- **Net present value of costs and benefits** – represents the present value over the 25-year period discounted to current 2020 dollars.
- **Benefit to cost ratio** – calculated as present value of costs divided by the present value of benefits.
- **Water Utility Costs** – costs that the District as a water utility will incur to operate the program including administrative costs.
- **Customer Costs** – costs customers will incur to implement a program in the Water Contractor's service area.
- **Utility Benefits** – the avoided cost to the District to produce the volume of water saved.
- **Customer Benefits** – the savings from reduced water/sewer utility bills and energy savings resulting from reduced use of hot water.

[18] Alliance for Water Efficiency, Water Conservation Tracking Tool Version 3, released in July 2016.

- **Total Water Utility Costs** – includes costs to the District for program implementation from 2021-2025.
- **Water Savings in 2025** – one-year estimated water savings in 2025.
- **Water Utility Cost of Water Saved for individual programs** – cost of water saved dividing by the lifetime water savings of that program.
- **Water Utility Cost of Water Saved for program scenarios** – weighted average of Water Utility Cost of Water Saved for the individual programs by the cumulative water savings through 2045.

This analysis estimates active program savings based on the AWE model, and does not include additional savings anticipated from passive savings (i.e., water savings associated with the natural replacement of less efficient water using fixtures and appliances due to both market shifts and increasing efficiency mandated by the building code and other regulatory requirements). Based on this analysis, and the assumptions presented in **Appendix B**, the benefit-cost ratios for the District range from 0.31 to 17.

Table 6-3c presents the results of the analysis of the three conservation program scenarios identified in **Table 6-3a**, and includes a summary of costs and benefits to the District and customers, estimated cumulative water savings through 2045 (based on assumed program implementation from 2021-2025), and the estimated cost of water saved to the District. Based on this, the approach of focusing water conservation measures on those ranked highest by the District (i.e., Scenario B) has a greater benefit to cost ratio than that of Scenarios A or C.

The projected water savings associated with implementation of Scenario B is 288 AF by 2025 and 798 by 2045, at a cost of approximately $1,222/AF.

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Sonoma-Marin Saving Water Partnership

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
RETAILER ACTIONS AND WATER RATES						
Install AMI for High Water Users and Large Landscape Accounts	2.5	4.7	11%	67%	No	✗
Install AMI in New Development	2.4	4.7	0%	67%	No	✗
Customer Water Loss Reduction (AMI Leak Detection)	2.4	4.4	0%	89%	No	✗
Install AMI for Existing Accounts	2.4	4.0	0%	86%	No	✗
Tiered Water Rates (Conservation Pricing)	2.0	3.6	0%	88%	No	✗
Water Budgeting/Monitoring for Large Landscape Accounts	2.5	3.4	0%	83%	No	✗
Water Budget Based Billing for Only Irrigation Customers	2.1	3.4	0%	86%	No	✗
Modification to or Implementation of Tiered Rate Conservation Pricing	2.0	3.4	0%	88%	No	✗
Establish Separate Pricing Structure for Irrigation Accounts	2.0	3.2	0%	83%	No	✗
Rate Structure Evaluation	2.4	3.1	0%	78%	No	✗
Increase Enforcement of State Water Waste Regulations	2.6	3.0	0%	86%	No	✗
Water Budget Based Billing for All Customers	2.3	2.4	0%	50%	No	✗
Increase Enforcement of Indoor Fixture Retrofit at Time of Sale	1.9	2.2	17%	67%	No	✗
Increase Enforcement of Customer Pressure Reducing Valve (PRV) Requirement	1.6	1.9	0%	40%	No	✗
Regional UHET and/or Urinal Bulk Purchase Program	1.9	1.7	75%	0%	No	✗
Average by Program Type	2.2	3.3				
PUBLIC OUTREACH AND EDUCATION						
QWEL Training (Qualified Water Efficient Landscaper)	4.3	2.0	89%	0%	Yes	✓
Public Outreach through Print & Electronic Media - Focused on Outdoor Irrigation	4.0	3.9	67%	0%	Yes	✓
Educational Workshops	4.0	3.2	63%	0%	Yes	✓
School Education Programs	4.0	3.1	78%	0%	Yes	✓

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Sonoma-Marin Saving Water Partnership

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
Water Use Surveys/Audits - SFR	3.5	3.9	22%	44%	No	✗
Public Outreach through Print & Electronic Media - Focused on Indoor Conservation	3.6	3.3	57%	0%	Yes	✓
Garden tour	3.6	1.9	86%	0%	Yes	✓
Water Use Surveys/Audits - CII	3.0	3.4	38%	38%	No	✗
Water Use Surveys/Audits - MFR	2.8	3.3	29%	43%	No	✗
Promote Green Building and Certification	3.1	2.2	33%	17%	No	✗
Provide Support with Smart Irrigation Controller Setup	2.9	2.3	60%	0%	No	✗
Average by Program Type	3.5	3.0				
DEVICE-BASED AND FINANCIAL INCENTIVE PROGRAMS						
Landscape Conversion or Turf Removal - MFR and CII	3.9	4.6	11%	78%	No	✗
Landscape Conversion or Turf Removal -SFR	3.9	4.6	22%	67%	No	✗
High Efficiency Faucet Aerator / Showerhead Giveaway - Residential Customers	3.0	3.9	11%	44%	No	✗
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - Large Landscape	3.1	3.6	38%	38%	No	✗
Drip Irrigation Incentive for SFR	2.4	3.6	25%	50%	No	✗
High Efficiency Faucet Aerator / Showerhead Giveaway - CII Customers	2.9	3.4	14%	57%	No	✗
Drip Irrigation Incentive for MFR and CII	2.4	3.4	25%	50%	No	✗
High Efficiency Clothes Washer Rebate - Residential	3.3	3.3	44%	11%	Yes	✓
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - SFR	2.9	3.2	14%	57%	No	✗
Restaurant Spray Nozzle Rebates	3.1	2.8	50%	0%	No	✗
Incentivize Irrigation Equipment Upgrades - SFR	2.1	3.0	17%	50%	No	✗
Indoor Fixture Program For Schools	2.9	2.9	14%	71%	No	✗
Rotating Sprinkler Nozzle Rebate	2.9	2.9	40%	20%	No	✗

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Sonoma-Marin Saving Water Partnership

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
High Efficiency Clothes Washer Rebate Program - CII	2.8	2.8	29%	29%	No	✗
Direct Install of Efficient Indoor Fixtures - Low Income Residential	2.8	2.6	60%	0%	No	✗
Indoor Fixture Program For Hotels & Motels	2.8	2.2	29%	43%	No	✗
Mulch rebate	2.6	2.7	33%	50%	No	✗
Rain Sensor Rebate	2.5	2.6	33%	50%	No	✗
Incentivize Submetering for Existing Customers - CII	2.4	2.6	25%	25%	No	✗
Incentivize Submetering for Existing Customers - MFR	2.4	2.6	25%	25%	No	✗
Incentivize Gray Water Retrofit for Existing SFR Customers	2.3	2.6	20%	60%	No	✗
Toilet Flapper Giveaway - SFR customers	2.1	2.6	40%	40%	No	✗
Rotating Sprinkler Nozzle Giveaway	2.5	2.1	60%	0%	No	✗
Incentivize Replacement of Inefficient Commercial and Industrial Equipment	2.4	2.4	33%	33%	No	✗
Soil Moisture Sensor Rebate	2.4	2.4	60%	20%	No	✗
High Efficiency Urinal (<0.25 gal/flush) Rebates - CII	2.4	2.4	25%	0%	No	✗
Incentivize Gray Water Systems for New CII Development	2.3	2.4	50%	25%	No	✗
Incentivize Irrigation Equipment Upgrades - Large Landscapes	1.9	2.4	20%	40%	No	✗
Direct Install of Efficient Indoor Fixtures - Residential	2.4	2.2	50%	0%	No	✗
High Efficiency Clothes Washer Install - Low Income Residential Customers	2.4	2.2	50%	0%	No	✗
Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - Large Landscape	2.4	2.0	80%	0%	No	✗
Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - SFR	2.4	2.0	60%	20%	No	✗
Incentivize Artificial Turf for Sports Fields	2.3	2.3	75%	0%	No	✗
UHET <1.0 gal/flush Rebate - Residential	2.1	2.3	50%	17%	No	✗
Water Savings Incentive Program for CII	2.1	2.2	40%	40%	No	✗

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Sonoma-Marin Saving Water Partnership

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
Hot Water on Demand Pump System Rebate	2.0	2.2	60%	20%	No	✗
UHET Direct Installation - CII	2.1	1.8	40%	0%	No	✗
Plumber Initiated UHET and / or Urinal Retrofit Program	2.1	1.8	67%	0%	No	✗
Direct Install of Efficient Indoor Fixtures - Government Buildings	2.1	1.6	50%	0%	No	✗
Rain Barrel Rebate	1.9	2.1	40%	40%	No	✗
Incentivize Replacement of Pressure Reducing Valves (PRVs) with 60-70 psi PRVs	2.0	2.0	33%	33%	No	✗
Thermostatic Shut-Off Valve Showerheads/Tub Spouts Rebates	2.0	1.9	50%	0%	No	✗
Dipper Well Rebates	2.0	1.8	50%	0%	No	✗
Rain Sensor Giveaway	2.0	1.7	75%	0%	No	✗
Rebates for Conductivity Controllers on Cooling Towers	2.0	1.6	75%	0%	No	✗
Rainwater Catchment System Rebate for Large Landscapes	1.9	2.0	50%	25%	No	✗
Nonresidential Incentive for Self-closing or Metering Faucets	1.9	1.9	33%	33%	No	✗
Efficient (EnergyStar) Dishwasher Rebates	1.9	1.8	50%	0%	No	✗
Rain Barrel Giveaway	1.9	1.7	75%	0%	No	✗
UHET Direct Installation - Residential	1.9	1.7	50%	0%	No	✗
Autoclave (Steam-Sterilizer) Retrofit Rebates	1.9	1.7	67%	0%	No	✗
Connectionless Food Steamer Rebates	1.9	1.7	67%	0%	No	✗
Dry Vacuum Pumps	1.9	1.6	33%	0%	No	✗
Incentivize Cooling Tower Upgrades	1.9	1.6	50%	0%	No	✗
UHET <1.0 gal/flush Rebate - CII	1.8	1.8	60%	20%	No	✗
Soil Moisture Sensor Giveaway	1.8	1.7	67%	0%	No	✗
Direct Install of Efficient Indoor Fixtures - Commercial and Industrial	1.8	1.7	67%	0%	No	✗

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Sonoma-Marin Saving Water Partnership

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
Swimming Pool and Hot Tub Cover Rebates	1.3	1.7	50%	25%	No	✗
Urinal Direct Installation - CII	1.5	1.4	50%	0%	No	✗
Tier 4 Exemption	1.3	1.4	25%	25%	No	✗
Incentivize Submetering of Cooling Towers for Existing Customers	1.3	1.4	50%	0%	No	✗
Average by Program Type	2.3	2.3				
POLICIES AND REGULATIONS						
Water Waste Ordinance	2.9	4.3	0%	63%	No	✗
Require Submetering of Landscaping for New MFR and Commercial Developments	2.8	4.0	0%	63%	No	✗
Require Water Efficiency Plan Reviews for New CII Development	2.5	3.7	14%	57%	No	✗
Require High Efficiency Clothes Washers in New Development	2.8	3.3	17%	67%	No	✗
Require Weather Adjusting Smart Irrigation Controllers, Rain Sensors, and/or Soil Moisture Sensors in New Development	2.4	3.1	0%	80%	No	✗
Require Irrigation Designers / Installers be Certified (QWEL)	3.0	2.9	40%	40%	No	✗
Demand Offset/Water Neutral Policy for Large New Developments	2.4	3.0	0%	83%	No	✗
Require Efficient (EnergyStar) Dishwashers in New Development	2.8	2.9	20%	60%	No	✗
Require <0.25 gal/flush Urinals in New Development	2.3	2.8	0%	67%	No	✗
Water Conserving Landscape and Irrigation Codes, More Stringent than MWELO	1.6	2.8	0%	67%	No	✗
Require Swimming Pool and Hot Tub Covers	2.0	2.7	40%	20%	No	✗
Require Submetering by Unit for New Commercial Developments	2.3	2.6	0%	50%	No	✗
Require Submetering of Landscaping for Existing MFR and Commercial Customers	2.4	2.4	0%	67%	No	✗
Require Hot Water on Demand / Structured Plumbing in New Residential Development	2.3	2.4	25%	50%	No	✗
Require Submetering by Unit for Existing Commercial Customers	2.1	2.4	0%	25%	No	✗

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Sonoma-Marin Saving Water Partnership

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
Require Submetering for New MFR Developments	1.9	2.4	0%	50%	No	✗
Require Plumbing for Recycled Water in New MFR Development	2.0	2.3	0%	60%	No	✗
Require <1.0 gal/flush Toilets in New Development	2.0	2.3	0%	80%	No	✗
Require Submetering for New Mobile Home Park Developments	2.0	2.3	0%	40%	No	✗
Prohibit Once through Cooling Systems	2.0	2.2	0%	50%	No	✗
Require Plumbing for Recycled Water in New CII Development	1.9	2.2	0%	60%	No	✗
Require On-Site Water Reuse Systems (Grey Water or Black Water) for Large CII Developments	1.8	2.1	25%	50%	No	✗
Require Plumbing for Gray Water in New SFR Development	1.6	2.1	0%	75%	No	✗
Require Submetering of Cooling Towers for New Development	2.0	1.9	0%	33%	No	✗
Require Submetering of Existing MFR (and Mobile Home Park) Customers	1.9	1.9	0%	50%	No	✗
Restrict Landscape Irrigation to Designated Days/Times	1.6	1.8	33%	0%	No	✗
Require Rain Barrels in New Development	1.5	1.8	0%	67%	No	✗
Require Submetering of Cooling Towers for Existing Customers	1.8	1.6	0%	50%	No	✗
Require Cooling Tower Retrofits	1.5	1.4	0%	33%	No	✗
Average by Program Type	2.1	2.5				

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Sonoma-Marin Saving Water Partnership

Abbreviations:

AMI = advanced metering infrastructure
CII = commercial, industrial, institutional
MFR = multi-family residential
MWELO = Model Water Efficient Landscape Ordinance
PRV = pressure reducing valve
SFR = single-family residential
SMSWP = Sonoma-Marin Saving Water Partnership
UHET = ultra high efficiency toilet

Notes:

(a) Each Water Contractor was asked to rank each conservation program or measure in terms of priority as a regionally-administered program, and as a locally-administered program, where 5 indicated highest priority and 1 indicated the lowest priority. Results are presented as an average of the responses of all nine Water Contractors.

(b) For each program a Water Contractor ranked as "3" or above, the Water Contractor was asked to indicate whether they would prefer the program to be administered regionally or locally. The results are presented as a percentage of the number of Water Contractors. Results of contractors who expressed "no preference" are not shown, and thus the total may not sum to 100% for a given measure.

Table 6-2
Prioritization of Conservation Measures and Programs
North Marin Water District, Sonoma-Marin Saving Water Partnership

Conservation Measure/Program	Prioritization (a)	Sector	Indoor	Outdoor	Primary End Use	Preference (b)	Local Program
RETAILER ACTIONS AND WATER RATES							
Increase Enforcement of Indoor Fixture Retrofit at Time of Sale	5	All	X		Toilet, Urinal, Faucet, Showerhead	Locally	Yes, currently
Install AMI for Existing Accounts	5	All	X	X	Water Loss	Locally	Yes, currently
Install AMI in New Development	5	All	X	X	Water Loss	Locally	Yes, currently
Customer Water Loss Reduction (AMI Leak Detection)	4	All	X	X	Water Loss	Locally	Yes, currently
Install AMI for High Water Users and Large Landscape Accounts	4	All		X	Water Loss	Locally	Yes, currently
Water Budget Based Billing for Only Irrigation Customers	4	CII, IRR		X	Irrigation	Locally	No
Increase Enforcement of State Water Waste Regulations	3	All		X	Irrigation	Locally	Yes, currently
Modification to or Implementation of Tiered Rate Conservation Pricing	3	All	X	X	All	Locally	Yes, currently
Rate Structure Evaluation	3	All	X	X	All	Locally	Yes, currently
Regional UHET and/or Urinal Bulk Purchase Program	3	All	X		Toilet / Urinal	Regionally	No
Tiered Water Rates (Conservation Pricing)	3	All	X	X	All	Locally	Yes, currently
Water Budget Based Billing for All Customers	3	All	X	X	All	Locally	No
PUBLIC OUTREACH AND EDUCATION							
Water Use Surveys/Audits - SFR	5	SFR	X	X	All	No preference	Yes, currently
Water Use Surveys/Audits - CII	4	CII	X	X	All	No preference	No
Water Use Surveys/Audits - MFR	4	MFR	X		All Indoor	No preference	Yes, currently
Public Outreach through Print & Electronic Media - Focused on Outdoor Irrigation	3	All	X		Irrigation	No preference	No
Educational Workshops	3	SFR		X	All Outdoor	Regionally	No
Public Outreach through Print & Electronic Media - Focused on Indoor Conservation	3	All		X	All Indoor	No preference	No
Provide Support with Smart Irrigation Controller Setup	3	All		X	Irrigation	No preference	No
DEVICE-BASED AND FINANCIAL INCENTIVE PROGRAMS							
Landscape Conversion or Turf Removal - MFR and CII	5	MFR, CII		X	Irrigation	Locally	Yes, currently
Landscape Conversion or Turf Removal -SFR	5	SFR		X	Irrigation	Locally	Yes, currently
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - Large Landscape	5	MFR, CII		X	Irrigation	Locally	Yes, currently

Table 6-2
Prioritization of Conservation Measures and Programs
North Marin Water District, Sonoma-Marin Saving Water Partnership

Conservation Measure/Program	Prioritization (a)	Sector	Indoor	Outdoor	Primary End Use	Preference (b)	Local Program
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - SFR	5	SFR		X	Irrigation	Locally	Yes, currently
Drip Irrigation Incentive for MFR and CII	5	MFR, CII		X	Irrigation	Locally	Yes, currently
Drip Irrigation Incentive for SFR	5	SFR		X	Irrigation	Locally	Yes, currently
Incentivize Irrigation Equipment Upgrades - SFR	5	SFR		X	Irrigation	Locally	Yes, currently
Mulch rebate	5	SFR		X	Irrigation	Locally	Yes, currently
High Efficiency Faucet Aerator / Showerhead Giveaway - CII Customers	4	CII	X		Faucet, Showerhead	Locally	Yes, currently
High Efficiency Faucet Aerator / Showerhead Giveaway - Residential Customers	4	SFR, MFR	X		Faucet, Showerhead	Locally	Yes, currently
High Efficiency Clothes Washer Rebate - Residential	4	SFR, MFR	X		Clothes Washer	Locally	Yes, currently
Incentivize Irrigation Equipment Upgrades - Large Landscapes	4	MFR, CII, IRR		X	Irrigation	Locally	Yes, currently
UHET <1.0 gal/flush Rebate - CII	4	CII	X		Toilet	Locally	Yes, currently
UHET <1.0 gal/flush Rebate - Residential	4	SFR, MFR	X		Toilet	Locally	Yes, currently
Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - Large Landscape	4	MFR, CII		X	Irrigation	Regionally	No
Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - SFR	4	SFR		X	Irrigation	Regionally	No
Rain Sensor Rebate	3	All		X	Irrigation	Locally	Yes, currently
Toilet Flapper Giveaway - SFR customers	3	SFR, MFR	X		Toilet	Locally	Yes, currently
Incentivize Gray Water Retrofit for Existing SFR Customers	3	SFR		X	Irrigation / Gray Water	Locally	Yes, currently
Rain Barrel Rebate	3	SFR		X	Irrigation	Locally	Yes, currently
Plumber Initiated UHET and / or Urinal Retrofit Program	3	All	X		Toilet	Regionally	No
Swimming Pool and Hot Tub Cover Rebates	3	SFR, MFR		X	Pool/Hot Tub	Locally	Yes, currently
POLICIES AND REGULATIONS							
Require Weather Adjusting Smart Irrigation Controllers, Rain Sensors, and/or Soil Moisture Sensors in New Development	5	All		X	Irrigation	Locally	Yes, currently
Water Waste Ordinance	4	All		X	All Outdoor	Locally	Yes, currently
Water Conserving Landscape and Irrigation Codes, More Stringent than MWELO	4	All		X	Irrigation	Locally	Yes, currently
Require High Efficiency Clothes Washers in New Development	4	SFR, MFR	X		Clothes Washer	Locally	Yes, currently

Table 6-2
Prioritization of Conservation Measures and Programs
North Marin Water District, Sonoma-Marin Saving Water Partnership

Conservation Measure/Program	Prioritization (a)	Sector	Indoor	Outdoor	Primary End Use	Preference (b)	Local Program
Require Plumbing for Recycled Water in New MFR Development	4	MFR		X	Irrigation / Recycled Water	Locally	Yes, currently
Require Plumbing for Recycled Water in New CII Development	4	CII		X	Irrigation / Recycled Water	Locally	Yes, currently
Require Submetering for New Mobile Home Park Developments	3	MFR	X		All Indoor	Locally	No
Require Submetering for New MFR Developments	3	MFR	X		All Indoor	Locally	No
Require Efficient (EnergyStar) Dishwashers in New Development	3	SFR, MFR	X		Dishwashers	Locally	Yes, currently
Require <0.25 gal/flush Urinals in New Development	3	CII	X		Urinal	Locally	Yes, currently
Require Irrigation Designers / Installers be Certified (QWEL)	3	All		X	Irrigation	Locally	No
Require Hot Water on Demand / Structured Plumbing in New Residential Development	3	SFR, MFR	X		Shower/Sink	Locally	No
Require <1.0 gal/flush Toilets in New Development	3	All	X		Toilet	Locally	No

Abbreviations:
AMI = advanced metering infrastructure
CII = commercial, industrial, institutional
COM = commercial
IRR = irrigation account
MFR = multi-family residential
MWELO = Model Water Efficient Landscape Ordinance
PRV = pressure reducing valve
SFR = single-family residential
SMSWP = Sonoma-Marin Saving Water Partnership
UHET = ultra high efficiency toilet

Notes:
(a) Each Water Contractor was asked to rank each conservation program or measure in terms of priority as a locally-administered program, where 5 indicated highest priority and 1 indicated the lowest priority. N/A Indicates no rank given.

(b) For each program a Water Contractor ranked as "3" or above, the Water Contractor was asked to indicate whether they would prefer the program to be administered regionally or locally. N/A indicates no preference given for programs given a ranking lower than three for both local and regional priority.

Table 6-3a
Conservation Program Scenarios
North Marin Water District, Sonoma-Marin Saving Water Partnership

Program	Sector	Indoor/ Outdoor	Program Scenario (a)		
			A) Outdoor Programs	B) Highly-Ranked Local Programs	C) Highly-Ranked Regional Programs
Drip Irrigation Incentive for MFR and CII	MFR, CII	Outdoor	X	X	
Drip Irrigation Incentive for SFR	SFR	Outdoor	X	X	
High Efficiency Clothes Washer Rebate - Residential	SFR, MFR	Indoor			X
High Efficiency Faucet Aerator / Showerhead Giveaway - Residential Customers	SFR, MFR	Indoor			X
Incentivize Irrigation Equipment Upgrades - SFR	SFR	Outdoor	X	X	
Landscape Conversion or Turf Removal - MFR and CII	MFR, CII	Outdoor	X	X	X
Landscape Conversion or Turf Removal -SFR	SFR	Outdoor	X	X	X
Mulch rebate	SFR	Outdoor	X	X	
Restaurant Spray Nozzle Rebates	CII	Indoor			X
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - Large Landscape	MFR, CII	Outdoor	X	X	X
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - SFR	SFR	Outdoor	X	X	
UHET <1.0 gal/flush Rebate - Residential	SFR, MFR	Indoor		X	
Water Use Surveys/Audits - CII	CII	Both	X		X
Water Use Surveys/Audits - SFR	SFR	Both	X	X	X

Abbreviations

CII = Commercial, Industrial, and Institutional
MFR = multi-family residential
SFR = Single-family residential

Notes

(a) Program scenarios represent three potential approaches to program selection. Scenario A represents a focus on outdoor water savings, Scenario B represents a more "business as usual" approach based on programs ranked most highly by North Marin Water District, and Scenario C represents a focus on the programs all nine Water Contractors collectively identified as highest priority.

Table 6-3b
Costs and Savings of Potential Conservation Programs
North Marin Water District, Sonoma-Marin Saving Water Partnership

Program (a)	Sector	Indoor/ Outdoor	Note	Net Present Value of Benefits		Net Present Value of Cost		Benefit to Cost Ratio		Water Utility Costs 2021-2025 (b)	Water Savings in 2025 (AFY)	Water Utility Cost of Water Saved ($/AF)
				Water Utility	Customers	Water Utility	Customers	Water Utility	Customers			
Drip Irrigation Incentive for MFR and CII	MFR, CII	Outdoor	(c)	$16,703	$28,405	$22,225	$17,096	0.75	1.7	$20,313	0.68	$2,404
Drip Irrigation Incentive for SFR	SFR	Outdoor	(c)	$10,898	$18,532	$35,559	$27,353	0.31	0.68	$32,500	0.44	$5,897
High Efficiency Clothes Washer Rebate - Residential	SFR, MFR	Indoor	(d)	$491,606	$1,535,631	$92,810	$1,070,881	5.3	1.4	$84,825	19	$348
High Efficiency Faucet Aerator / Showerhead Giveaway - Residential Customers	SFR, MFR	Indoor		$61,640	$102,693	$34,137	$54,707	1.8	1.9	$31,200	6.7	$916
Incentivize Irrigation Equipment Upgrades - SFR	SFR	Outdoor		$27,849	$47,075	$17,780	$13,677	1.6	3.4	$16,250	1.4	$1,124
Landscape Conversion or Turf Removal - MFR and CII	MFR, CII	Outdoor	(d)	$16,338	$31,375	$15,869	$36,621	1.0	0.86	$14,504	0.82	$1,711
Landscape Conversion or Turf Removal -SFR	SFR	Outdoor	(d)	$201,579	$340,741	$195,796	$451,838	1.0	0.75	$178,952	10	$1,711
Mulch rebate	SFR	Outdoor	(d)	$92,987	$154,919	$97,898	$30,123	0.95	5.1	$89,476	10	$1,741
Restaurant Spray Nozzle Rebates	CII	Indoor		$123,364	$396,386	$7,112	$5,471	17	72	$6,500	13	$95
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - Large Landscape	MFR, CII	Outdoor	(d)(e)	$33,807	$64,922	$17,256	$85,198	2.0	0.76	$15,772	1.7	$899
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - SFR	SFR	Outdoor	(d)(e)	$61,980	$104,768	$19,558	$15,044	3.2	6.96	$17,875	3.1	$556
UHET <1.0 gal/flush Rebate - Residential	SFR, MFR	Indoor		$1,569,711	$1,495,055	$213,356	$109,413	7.4	14	$195,000	22	$338
Water Use Surveys/Audits - CII	CII	Both		$142,216	$268,543	$142,237	$177,796	1.0	1.5	$130,000	16	$1,636
Water Use Surveys/Audits - SFR	SFR	Both	(d)	$353,154	$721,840	$339,876	$80,692	1.0	8.9	$310,635	39	$1,574

Abbreviations

AFY = acre-feet per year
CII = Commercial, Industrial, and Institutional
MFR = multi-family residential
NMWD = North Marin Water District
SFR = Single-family residential
sq ft = square feet
WBIC = weather-based irrigation controller
$/AF = dollars per acre-foot

Table 6-3b
Costs and Savings of Potential Conservation Programs
North Marin Water District, Sonoma-Marin Saving Water Partnership

Notes

(a) Estimated water savings, benefits, and costs are calculated using the AWE model. Assumptions used are presented in Appendix B.
(b) For purposes of near-term conservation program analysis, it is assumed that all programs are active from 2021 through 2025.
(c) The benefit-cost results of the drip irrigation programs are strongly influenced by the lawn size. As lawn size goes up, the unit cost goes down, and the benefit-cost ratio goes up. NMWD customers average lawn size is estimated based on the past participants of the turf replacement program.
(d) Program savings are based on NMWD-specific estimates, which are derived from participant water savings based on their water bills.
(e) Program savings are based on the past savings of the WBIC rebate program. The program participation sample size was limited, and thus conservation savings estimates may not be as robust as they would be with a larger sample size.

Table 6-3c

Comparison of Program Scenarios – Costs and Savings

North Marin Water District, Sonoma-Marin Saving Water Partnership

Scenario (a)	Present Value of Benefits		Present Value of Cost		Benefit to Cost Ratio		Cumulative Water Savings (AF)					Water Utility Cost of Water Saved ($/AF) (b)
	Water Utility	Customers	Water Utility	Customers	Water Utility	Customers	2025	2030	2035	2040	2045	
A) Outdoor Programs	$957,512	$1,781,120	$904,054	$935,438	1.1	1.9	273	471	509	510	510	$1,774
B) Highly-Ranked Local Programs	$2,385,007	$3,007,632	$975,172	$867,055	2.4	3.5	288	560	679	744	798	$1,222
C) Highly-Ranked Regional Programs	$1,423,705	$3,462,132	$845,093	$1,963,204	1.7	1.8	345	617	710	734	734	$1,151

Abbreviations

AF = acre-feet

$/AF = dollars per acre-foot

Notes

(a) For purposes of near-term conservation program analysis, it is assumed that all programs are active from 2021 through 2025. Cumulative water savings achieved beyond 2025 reflect the ongoing benefit of program implementation.

(b) The water utility cost is based on the cumulative savings achieved through 2045 cumulative water savings.

7. CONCLUSION

This report presents the results of demand analysis and projections, developed consistent with CWC § 10631(d)(4)(A), which requires that "Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area." The assumptions used as the bases for demand projections were developed in close coordination with the District and reflect a land-use based approach consistent with the District's community planning, using the best available information. It should be noted that all demand and conservation projections have limitations and should be considered estimates that require revisiting as factors that affect demands arise, such as significant economic or population shifts, extreme hydrological conditions, etc.

The methodology used to develop demand projections herein is also consistent with the CWC §10635(b)(4), requirement to consider climate change on projected demands.[19] California experienced a historic drought between 2011-2017. In 2014, Governor Brown issued Executive Order B-26-14 declaring a Drought State of Emergency and requested all Californians to voluntarily reduce water use by 20%. In 2015, the State Water Resources Control Board implemented emergency conservation regulations that, among other things, required water agencies to reduce their water use and prohibited certain types of water uses. As a result, the District experienced an overall decrease in demands during the historic drought, most significantly during 2014. The demand factors evaluated herein consider the 2011-2013 period in which customers increased their water use, in part due to the drought conditions prior to the imposed restrictions. Thus, the periods used to develop the demand projections reflect conditions representative of the hotter, drier weather expected as a result of climate change.

[19] CWC §10635(b)(4) requires that suppliers consider plausible changes on projected supplies and demands under climate change conditions specific to their five-year drought risk assessments. Section 4.5 of the draft 2020 UWMP Guidebook more generally recommends that consideration of climate change be incorporated into all demand projections.

8. REFERENCES

ABAG, 2013. Association of Bay Area Governments, Plan Bay Area Projections 2013, adopted on 18 July 2013.

ABAG, 2018. Association of Bay Area Governments, Plan Bay Area Projections 2040, released on November 2018.

ABAG, 2020. Association of Bay Area Governments, Regional Housing Needs Allocation Proposed Methodology: San Francisco Bay Area, 2023-2031, released on October 2020.

AWE, 2015. An Assessment of Increasing Water-Use Efficiency on Demand Hardening, Alliance for Water Efficiency, dated July 2015, https://www.allianceforwaterefficiency.org/impact/our-work/research-report-water-use-efficiency-and-demand-hardening.

AWE, 2016. Water Conservation Tracking Tool Version 3, Alliance for Water Efficiency, released in July 2016.

Census, 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau, downloaded on 14 January 2020.

City of Novato, 2020. City of Novato General Plan 2035, https://www.novato.org/home/showpublisheddocument?id=30461, dated February 2020.

Columbia Public Health, 2013. Difference in Difference Estimation. Columbia Public Health, https://www.publichealth.columbia.edu/research/population-health-methods/difference-difference-estimation#Overview, accessed 28 September 2020.

DOF, 2020. California Department of Finance – Demographic Research Unit, Total Estimated and Projected Population for California and Counties: July 1, 2010 to July 1, 2060 in 1-year Increments, Report P-1, released on 10 January 2020.

DWR, 2020. WUEdata – Water Audit Report Data website, accessed 13 June 2020, (https://wuedata.water.ca.gov/awwa_plans).

HCD, 2017. Memorandum: State Income Limits for 2017, California Department of Housing and Community Development, dated 9 June 2017.

NMWD, 2015. 2015 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update, prepared by Maddaus water Management Inc., dated 1 July 2015.

NMWD, 2016. 2015 Urban Water Management Plan, prepared by North Marin Water District, dated June 2016.

NMWD, 2019. 2018 Novato Water System Master Plan Update, prepared by North Marin Water District, dated September 2019.

NMWD, 2020. Billing history data: 2010-2019 MonthlyWaterByService2004_2019.xlsx, provided by North Marin Water District on 13 April 2020.

PG&E, 2020. Gas Rate Finder, Volume 48-G, No.3, dated in March 2020 (https://www.pge.com/tariffs/GRF0320.pdf).

PG&E and Marin Clean Energy, 2020. Joint Rate Comparisons, dated May 2020 (https://www.pge.com/pge_global/common/pdfs/customer-service/other-services/alternative-energy-providers/community-choice-aggregation/mce_rateclasscomparison.pdf).

Appendix A

California Water Code Revisions per AB-1668, SB-606, and SB-664, Redlines prepared by DWR

SB-664 Water: urban water management planning. (2015-2016)

As Amends the Law Today **As Amends the Law on Nov 20, 2015**

SECTION 1. *Section 10632.5 is added to the Water Code, to read:*

10632.5. *(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.*

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

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

AB-1668 Water management planning. (2017-2018)

As Amends the Law Today | **As Amends the Law on Nov 08, 2018**

SECTION 1. Section 531.10 of the Water Code is amended to read:

531.10. (a) (1) An agricultural water supplier shall submit an annual report to the department that summarizes aggregated farm-gate delivery data, on a monthly or bimonthly basis, using best professional practices. The annual report for the prior year shall be submitted to the department by April 1 of each year. The annual report shall be organized by basin, as defined in Section 10721, within the service area of the agricultural water supplier, if applicable.

(2) The report, and any amendments to the report, submitted to the department pursuant to this subdivision shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(3) The department shall post all reports on its Internet Web site in a manner that allows for comparisons across water suppliers. The department shall make the reports available for public viewing in a timely manner after it receives them.

(b) Nothing in this article shall be construed to require the implementation of water measurement programs or practices that are not locally cost effective.

(c) It is the intent of the Legislature that the requirements of this section shall complement and not affect the scope of authority granted to the department or the board by provisions of law other than this article.

SEC. 2. Section 1120 of the Water Code is amended to read:

1120. This chapter applies to any decision or order issued under this part or Section 275, Part 2 (commencing with Section 1200), Part 2 (commencing with Section 10500) of Division 6, Part 2.55 (commencing with Section 10608) of Division 6, or Chapter 11 (commencing with Section 10735) of Part 2.74 of Division 6, Article 7 (commencing with Section 13550) of Chapter 7 of Division 7, or the public trust doctrine.

SEC. 3. *Section 1846.5 is added to the Water Code, to read:*

1846.5. *(a) An urban retail water supplier who commits any of the violations identified in subdivision (b) may be liable in an amount not to exceed the following, as applicable:*

(1) If the violation occurs in a critically dry year immediately preceded by two or more consecutive below normal, dry, or critically dry years or during a period for which the Governor has issued a proclamation of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, ten thousand dollars ($10,000) for each day in which the violation occurs.

(2) For all violations other than those described in paragraph (1), one thousand dollars ($1,000) for each day in which the violation occurs.

(b) Liability pursuant to this section may be imposed for any of the following violations:

(1) Violation of an order issued under Chapter 9 (commencing with Section 10609) of Part 2.55 of Division 6.

(2) Violation of a regulation issued under Chapter 9 (commencing with Section 10609) of Part 2.55 of Division 6, if the violation occurs after November 1, 2027.

(c) Civil liability may be imposed by the superior court. The Attorney General, upon the request of the board, shall petition the superior court to impose, assess, and recover those sums.

(d) Civil liability may be imposed administratively by the board pursuant to Section 1055.

SEC. 4. Section 10608.12 of the Water Code is amended to read:

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "CII water use" means water used by commercial water users, industrial water users, institutional water users, and large landscape water users.

(e) "Commercial water user" means a water user that provides or distributes a product or service.

(f) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(g) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(h) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(i) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(j) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(k) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(l) "Large landscape" means a nonresidential landscape as described in the performance measures for CII water use adopted pursuant to Section 10609.10.

(m) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(n) "Performance measures" means actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users. Performance measures may include, but are not limited to, educating CII water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not include process water.

(o) "Potable reuse" means direct potable reuse, indirect potable reuse for groundwater recharge, and reservoir water augmentation as those terms are defined in Section 13561.

(p) "Process water" means water used by industrial water users for producing a product or product content or water used for research and development. Process water includes, but is not limited to, continuous manufacturing processes, and water used for testing, cleaning, and maintaining equipment. Water used to cool machinery or buildings used in the manufacturing process or necessary to maintain product quality or chemical characteristics for product manufacturing or control rooms, data centers, laboratories, clean rooms, and other industrial facility units that are integral to the manufacturing or research and development process is process water. Water used in the manufacturing process that is necessary for complying with local, state, and federal health and safety laws, and is not incidental water, is process water. Process water does not mean incidental water uses.

(q) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050.

(r) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(s) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(t) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(u) "Urban water use objective" means an estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, as described in Section 10609.20.

(v) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(w) "Urban wholesale water ~~supplier"~~ *supplier,"* means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

SEC. 5. Section 10608.20 of the Water Code is amended to read:

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's ~~2017~~ *2016* report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its ~~internet website,~~ *Internet Web site,* and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

(2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

SEC. 6. Section 10608.48 of the Water Code is amended to read:

10608.48. (a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement both of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier’s pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The department shall require information about the implementation of efficient water management practices to be reported using a standardized form developed pursuant to Section 10608.52.

(f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

SEC. 7. *Chapter 9 (commencing with Section 10609) is added to Part 2.55 of Division 6 of the Water Code, to read:*

CHAPTER 9. Urban Water Use Objectives and Water Use Reporting

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

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

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

(A) Indoor residential use.

(B) Outdoor residential use.

(C) CII water use.

(D) Water losses.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(1) Outdoor residential water use.

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

(3) A volume for water loss.

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

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

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

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

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

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

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

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

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

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

(B) The standards shall apply to irrigable lands.

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

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

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

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

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

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

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

(a) Evapotranspiration adjustment factors, as applicable.

(b) Landscape area.

(c) Maximum applied water allowance.

(d) Reference evapotranspiration.

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

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

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

(1) Recommendations for a CII water use classification system for California that address significant uses of water.

(2) Recommendations for setting minimum size thresholds for converting mixed CII meters to dedicated irrigation meters, and evaluation of, and recommendations for, technologies that could be used in lieu of requiring dedicated irrigation meters.

(3) Recommendations for CII water use best management practices, which may include, but are not limited to, water audits and water management plans for those CII customers that exceed a recommended size, volume of water use, or other threshold.

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

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

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

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

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

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

(1) Significant use of evaporative coolers.

(2) Significant populations of horses and other livestock.

(3) Significant fluctuations in seasonal populations.

(4) Significant landscaped areas irrigated with recycled water having high levels of total dissolved solids.

(5) Significant use of water for soil compaction and dust control.

(6) Significant use of water to supplement ponds and lakes to sustain wildlife.

(7) Significant use of water to irrigate vegetation for fire protection.

(8) Significant use of water for commercial or noncommercial agricultural use.

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

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

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

(1) A list of all urban retail water suppliers with approved variances.

(2) The specific variance or variances approved for each urban retail water supplier.

(3) The data supporting approval of each variance.

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

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

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

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

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

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

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

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

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

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

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

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

SEC. 8. *Chapter 10 (commencing with Section 10609.40) is added to Part 2.55 of Division 6 of the Water Code, to read:*

CHAPTER 10. Countywide Drought and Water Shortage Contingency Plans

10609.40. *The Legislature finds and declares both of the following:*

(a) Small water suppliers and rural communities are often not covered by established water shortage planning requirements. Currently, most counties do not address water shortages or do so minimally in their general plan or the local hazard mitigation plan.

(b) The state should provide guidance to improve drought planning for small water suppliers and rural communities.

10609.42. *(a) No later than January 1, 2020, the department, in consultation with the board and other relevant state and local agencies and stakeholders, shall use available data to identify small water suppliers and rural communities that may be at risk of drought and water shortage vulnerability. The department shall notify counties and groundwater sustainability agencies of those suppliers or communities that may be at risk within its jurisdiction, and may make the information publicly accessible on its Internet Web site.*

(b) The department shall, in consultation with the board, by January 1, 2020, propose to the Governor and the Legislature recommendations and guidance relating to the development and implementation of countywide drought and water shortage contingency plans to address the planning needs of small water suppliers and rural communities. The department shall recommend how these plans can be included in county local hazard

mitigation plans or otherwise integrated with complementary existing planning processes. The guidance from the department shall outline goals of the countywide drought and water shortage contingency plans and recommend components including, but not limited to, all of the following:

(1) Assessment of drought vulnerability.

(2) Actions to reduce drought vulnerability.

(3) Response, financing, and local communication and outreach planning efforts that may be implemented in times of drought.

(4) Data needs and reporting.

(5) Roles and responsibilities of interested parties and coordination with other relevant water management planning efforts.

(c) In formulating the proposal, the department shall utilize a public process involving state agencies, cities, counties, small communities, small water suppliers, and other stakeholders.

SEC. 9. Section 10801 of the Water Code is amended to read:

10801. The Legislature finds and declares all of the following:

(a) The waters of the state are a limited and renewable resource.

(b) The California Constitution requires that water in the state be used in a reasonable and beneficial manner.

(c) The efficient use of agricultural water supplies is of great statewide concern.

(d) There is a great amount of reuse of delivered water, both inside and outside the water service areas of agricultural water suppliers.

(e) Significant noncrop beneficial uses are associated with agricultural water use, including the preservation and enhancement of fish and wildlife resources.

(f) Significant opportunities exist in some areas, through improved irrigation water management, to conserve water or to reduce the quantity of highly saline or toxic drainage water.

(g) Changes in water management practices should be carefully planned and implemented to minimize adverse effects on other beneficial uses currently being served.

(h) Agricultural water suppliers that receive water from the federal Central Valley Project are required by federal law to prepare and implement water conservation plans.

(i) Agricultural water users applying for a permit to appropriate water from the board are required to prepare and implement water conservation plans.

SEC. 10. Section 10802 of the Water Code is amended to read:

10802. The Legislature finds and declares that all of the following are the policies of the state:

(a) The efficient use of water shall be pursued actively to protect both the people of the state and the state's water resources.

(b) The efficient use of agricultural water supplies shall be an important criterion in public decisions with regard to water.

(c) Agricultural water suppliers shall be required to prepare water management plans to achieve greater efficiency in the use of water.

SEC. 11. Section 10814 of the Water Code is amended to read:

10814. "Person" has the same meaning as defined in Section 10614.

SEC. 12. Section 10817 of the Water Code is amended to read:

10817. "Water use efficiency" means the efficient management of water resources for beneficial uses, preventing waste, or accomplishing additional benefits with the same amount of water.

SEC. 13. Section 10820 of the Water Code is amended to read:

10820. (a) (1) Except as provided in paragraph (2), an agricultural water supplier shall prepare and adopt an agricultural water management plan in the manner set forth in this chapter on or before December 31, 2012, and shall update that plan on December 31, 2015.

(2) (A) The agricultural water management plan shall be updated on or before April 1, 2021, and thereafter on or before April 1 in the years ending in six and one. The plan shall satisfy the requirements of Section 10826.

(B) An agricultural water supplier shall submit its plan to the department no later than 30 days after the adoption of the plan. The plan shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) (1) The department shall review each plan that is due pursuant to paragraph (2) of subdivision (a). The department may coordinate its review with the Department of Food and Agriculture and the board.

(2) The department shall notify an agricultural water supplier that it is not in compliance with this part if the department determines that actions are required to comply with the requirements of this part or if a supplier fails to update a plan as provided in paragraph (2) of subdivision (a). The department shall identify the specific deficiencies and the supplier shall have 120 days to remedy an identified deficiency. The department may provide additional time to remedy a deficiency if it finds that a supplier is making substantial progress toward remedying the deficiency. An agricultural water supplier that fails to submit corrective actions or a completed plan shall not be in compliance with this part.

(3) If the department has not received a plan or the department has determined that the plan submitted does not comply with the requirements of this part, and a revised plan has not been submitted, the department may undertake the following actions:

(A) Contract with a state academic institution or qualified entity to prepare or complete an agricultural water management plan on behalf of the supplier. The costs and expenses related to preparation or completion of a plan, including the costs of the contract and contract administration, shall be recoverable by the department from the supplier.

(B) If a supplier does not provide data necessary for the preparation or completion of a plan to the department or the contracting entity as determined by the department in accordance with subparagraph (A), the department may assess a fine of one thousand dollars ($1,000) per day, not to exceed twenty-five thousand dollars ($25,000), until data is made available.

(4) (A) A plan prepared or completed pursuant to paragraph (3) shall be deemed the adopted plan for the supplier.

(B) Any action to challenge or invalidate the adequacy of the plan prepared or completed pursuant to paragraph (3) shall be brought against the supplier for whom the plan was prepared.

(c) Every supplier that becomes an agricultural water supplier after December 31, 2012, shall prepare and adopt an agricultural water management plan within one year after the date it has become an agricultural water supplier.

(d) A water supplier that indirectly provides water to customers for agricultural purposes shall not prepare a plan pursuant to this part without the consent of each agricultural water supplier that directly provides that water to its customers.

SEC. 14. Section 10825 of the Water Code is amended to read:

10825. (a) It is the intent of the Legislature in enacting this part to allow levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

(b) This part does not require the implementation of water use efficiency programs or practices that are not locally cost effective.

SEC. 15. Section 10826 of the Water Code is amended to read:

10826. An agricultural water management plan shall be adopted in accordance with this chapter. The plan shall do all of the following:

(a) Describe the agricultural water supplier and the service area, including all of the following:

(1) Size of the service area.

(2) Location of the service area and its water management facilities.

(3) Terrain and soils.

(4) Climate.

(5) Operating rules and regulations.

(6) Water delivery measurements or calculations.

(7) Water rate schedules and billing.

(8) Water shortage allocation policies.

(b) Describe the quantity and quality of water resources of the agricultural water supplier, including all of the following:

(1) Surface water supply.

(2) Groundwater supply.

(3) Other water supplies, including recycled water.

(4) Source water quality monitoring practices.

(5) Water uses within the agricultural water supplier's service area, including all of the following:

(A) Agricultural.

(B) Environmental.

(C) Recreational.

(D) Municipal and industrial.

(E) Groundwater recharge, including estimated flows from deep percolation from irrigation and seepage.

(c) Include an annual water budget based on the quantification of all inflow and outflow components for the service area of the agricultural water supplier. Components of inflow shall include surface inflow, groundwater pumping in the service area, and effective precipitation. Components of outflow shall include surface outflow, deep percolation, and evapotranspiration. An agricultural water supplier shall report the annual water budget on a water-year basis. The department shall provide tools and resources to assist agricultural water suppliers in developing and quantifying components necessary to develop a water budget.

(d) Include an analysis, based on available information, of the effect of climate change on future water supplies.

(e) Describe previous water management activities.

(f) Identify water management objectives based on the water budget to improve water system efficiency or to meet other water management objectives. The agricultural water supplier shall identify, prioritize, and implement actions to reduce water loss, improve water system management, and meet other water management objectives identified in the plan.

(g) Include in the plan information regarding efficient water management practices required pursuant to Section 10608.48.

(h) Quantify the efficiency of agricultural water use within the service area of the agricultural water supplier using the appropriate method or methods from among the four water use efficiency quantification methods developed by the department in the May 8, 2012, report to the Legislature entitled "A Proposed Methodology for

Quantifying the Efficiency of Agricultural Water Use." The agricultural water supplier shall account for all water uses, including crop water use, agronomic water use, environmental water use, and recoverable surface flows.

SEC. 16. *Section 10826.2 is added to the Water Code, to read:*

10826.2. *As part of its agricultural water management plan, each agricultural water supplier shall develop a drought plan for periods of limited water supply describing the actions of the agricultural water supplier for drought preparedness and management of water supplies and allocations during drought conditions. The drought plan shall contain both of the following:*

(a) Resilience planning, including all of the following:

(1) Data, indicators, and information needed to determine the water supply availability and levels of drought severity.

(2) Analyses and identification of potential vulnerability to drought.

(3) A description of the opportunities and constraints for improving drought resilience planning, including all of the following:

(A) The availability of new technology or information.

(B) The ability of the agricultural water supplier to obtain or use additional water supplies during drought conditions.

(C) A description of other actions planned for implementation to improve drought resilience.

(b) Drought response planning, including all of the following:

(1) Policies and a process for declaring a water shortage and for implementing water shortage allocations and related response actions.

(2) Methods and procedures for the enforcement or appeal of, or exemption from, triggered shortage response actions.

(3) Methods and procedures for monitoring and evaluation of the effectiveness of the drought plan.

(4) Communication protocols and procedures to inform and coordinate customers, the public, interested parties, and local, regional, and state government.

(5) A description of the potential impacts on the revenues, financial condition, and planned expenditures of the agricultural water supplier during drought conditions that reduce water allocations, and proposed measures to overcome those impacts, including reserve-level policies.

SEC. 17. Section 10843 of the Water Code is amended to read:

10843. (a) An agricultural water supplier shall submit to the entities identified in subdivision (b) a copy of its plan no later than 30 days after review of the plan pursuant to subdivision (b) of Section 10820.

(b) An agricultural water supplier shall submit a copy of its plan to each of the following entities:

(1) The department.

(2) Any city, county, or city and county within which the agricultural water supplier provides water supplies.

(3) Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.

(4) The California State Library.

SEC. 18. Section 10845 of the Water Code is amended to read:

10845. (a) The department shall prepare and submit to the Legislature, on or before April 30, 2022, and thereafter in the years ending in seven and years ending in two, a report summarizing the status of the plans adopted pursuant to this part.

(b) The report prepared by the department shall identify the outstanding elements of any plan adopted pursuant to this part. The report shall include an evaluation of the effectiveness of this part in promoting efficient agricultural water management practices and recommendations relating to proposed changes to this part, as appropriate.

(c) The department shall provide a copy of the report to each agricultural water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearing designed to consider the effectiveness of plans submitted pursuant to this part.

(d) This section does not authorize the department, in preparing the report, to approve, disapprove, or critique individual plans submitted pursuant to this part.

SEC. 19. Section 10910 of the Water Code is amended to read:

10910. (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system whose service area includes the project site and any water system adjacent to the project site that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined in Section 10912, that may supply water for the project. If the city or county is not able to identify any public water system that may supply water for the project, the city or county shall prepare the water assessment required by this part after consulting with any entity serving domestic water supplies whose service area includes the project site, the local agency formation commission, and any public water system adjacent to the project site.

(c) (1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system’s total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system’s existing and planned future uses, including agricultural and manufacturing uses.

(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

(d) (1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts.

(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:

(A) Written contracts or other proof of entitlement to an identified water supply.

(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.

(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.

(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.

(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contractholders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.

(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment:

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2) (A) A description of any groundwater basin or basins from which the proposed project will be supplied.

(B) For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree.

(C) For a basin that has not been adjudicated that is a basin designated as high- or medium-priority pursuant to Section 10722.4, information regarding the following:

(i) Whether the department has identified the basin as being subject to critical conditions of overdraft pursuant to Section 12924.

(ii) If a groundwater sustainability agency has adopted a groundwater sustainability plan or has an approved alternative, a copy of that alternative or plan.

(D) For a basin that has not been adjudicated that is a basin designated as low- or very low priority pursuant to Section 10722.4, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water supply assessment shall not be required to include the information required by this paragraph if the public water system

determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by subparagraph (D) of paragraph (4) of subdivision (b) of Section 10631.

(g) (1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.

(2) Prior to the expiration of the 90-day period, if the public water system intends to request an extension of time to prepare and adopt the assessment, the public water system shall meet with the city or county to request an extension of time, which shall not exceed 30 days, to prepare and adopt the assessment.

(3) If the public water system fails to request an extension of time, or fails to submit the assessment notwithstanding the extension of time granted pursuant to paragraph (2), the city or county may seek a writ of mandamus to compel the governing body of the public water system to comply with the requirements of this part relating to the submission of the water supply assessment.

(h) Notwithstanding any other provision of this part, if a project has been the subject of a water supply assessment that complies with the requirements of this part, no additional water supply assessment shall be required for subsequent projects that were part of a larger project for which a water supply assessment was completed and that has complied with the requirements of this part and for which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has concluded that its water supplies are sufficient to meet the projected water demand associated with the proposed project, in addition to the existing and planned future uses, including, but not limited to, agricultural and industrial uses, unless one or more of the following changes occurs:

(1) Changes in the project that result in a substantial increase in water demand for the project.

(2) Changes in the circumstances or conditions substantially affecting the ability of the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), to provide a sufficient supply of water for the project.

(3) Significant new information becomes available that was not known and could not have been known at the time when the assessment was prepared.

(i) For the purposes of this section, hauled water is not considered as a source of water.

SEC. 20. *This act shall become operative only if Senate Bill 606 of the 2017–18 Regular Session is enacted and becomes effective.*

SB-606 Water management planning. (2017-2018)

As Amends the Law Today **As Amends the Law on Nov 08, 2018**

SECTION 1. Section 350 of the Water Code is amended to read:

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

SEC. 2. Section 377 of the Water Code is amended to read:

377. (a) From and after the publication or posting of any ordinance or resolution pursuant to Section 376, a violation of a requirement of a water conservation program adopted pursuant to Section 376 is a misdemeanor. A person convicted under this subdivision shall be punished by imprisonment in the county jail for not more than 30 days, or by a fine not exceeding one thousand dollars ($1,000), or by both.

(b) A court or public entity may hold a person civilly liable in an amount not to exceed ten thousand dollars ($10,000) for a violation of any of the following:

(1) An ordinance or resolution adopted pursuant to Section 376.

(2) A regulation adopted by the board under Section 1058.5 or Chapter 9 (commencing with Section 10609) of Part 2.55 of Division 6, unless the board regulation provides that it cannot be enforced under this section or provides for a lesser applicable maximum penalty.

(c) Commencing on the 31st day after the public entity notified a person of a violation described in subdivision (b), the person additionally may be civilly liable in an amount not to exceed ten thousand dollars ($10,000) plus five hundred dollars ($500) for each additional day on which the violation continues.

(d) Remedies prescribed in this section are cumulative and not alternative, except that no liability shall be recoverable under this section for any violation of paragraph (2) of subdivision (b) if the board has filed a complaint pursuant to Section 1846 alleging the same violation.

(e) A public entity may administratively impose the civil liability described in subdivisions (b) and (c) after providing notice and an opportunity for a hearing. The public entity shall initiate a proceeding under this subdivision by a complaint issued pursuant to Section 377.5. The public entity shall issue the complaint at least 30 days before the hearing on the complaint and the complaint shall state the basis for the proposed civil liability order.

(f) (1) In determining the amount of civil liability to assess, a court or public entity shall take into consideration all relevant circumstances, including, but not limited to, the nature and persistence of the violation, the extent of the harm caused by the violation, the length of time over which the violation occurs, and any corrective action taken by the violator.

(2) The civil liability calculated pursuant to paragraph (1) for the first violation of subdivision (b) by a residential water user shall not exceed one thousand dollars ($1,000) except in extraordinary situations where the court or public entity finds all of the following:

(A) The residential user had actual notice of the requirement found to be violated.

(B) The conduct was intentional.

(C) The amount of water involved was substantial.

(g) Civil liability imposed pursuant to this section shall be paid to the public entity and expended solely for the purposes of this chapter.

(h) An order setting administrative civil liability shall become effective and final upon issuance of the order and payment shall be made. Judicial review of any final order shall be pursuant to Section 1094.5 of the Code of Civil Procedure.

(i) In addition to the remedies prescribed in this section, a public entity may enforce water use limitations established by an ordinance or resolution adopted pursuant to this chapter, or as otherwise authorized by law, by a volumetric penalty in an amount established by the public entity.

SEC. 3. Section 1058.5 of the Water Code is amended to read:

1058.5. (a) This section applies to any emergency regulation adopted by the board for which the board makes both of the following findings:

(1) The emergency regulation is adopted to prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation, to require curtailment of diversions when water is not available under the diverter's priority of right, or in furtherance of any of the foregoing, to require reporting of diversion or use or the preparation of monitoring reports.

(2) The emergency regulation is adopted in response to conditions which exist, or are threatened, in a critically dry year immediately preceded by two or more consecutive below normal, dry, or critically dry years or during a period for which the Governor has issued a proclamation of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions.

(b) Notwithstanding Sections 11346.1 and 11349.6 of the Government Code, any findings of emergency adopted by the board, in connection with the adoption of an emergency regulation under this section, are not subject to review by the Office of Administrative Law.

(c) An emergency regulation adopted by the board under this section may remain in effect for up to one year, as determined by the board, and is deemed repealed immediately upon a finding by the board that due to changed conditions it is no longer necessary for the regulation to remain in effect. An emergency regulation adopted by the board under this section may be renewed if the board determines that the conditions specified in paragraph (2) of subdivision (a) are still in effect.

(d) In addition to any other applicable civil or criminal penalties, any person or entity ~~that~~ *who* violates a regulation adopted by the board pursuant to this section is guilty of an infraction punishable by a fine of up to five hundred dollars ($500) for each day in which the violation occurs.

(e) (1) Notwithstanding subdivision (b) of Section 1551 or subdivision (e) of Section 1848, a civil liability imposed under Chapter 12 (commencing with Section 1825) of Part 2 of Division 2 by the board or a court for a violation of an emergency conservation regulation adopted pursuant to this section shall be deposited, and separately accounted for, in the Water Rights Fund. Funds deposited in accordance with this subdivision shall be available, upon appropriation, for water conservation activities and programs.

(2) For purposes of this subdivision, an "emergency conservation regulation" means an emergency regulation that requires an end user of water, a water retailer, or a water wholesaler to conserve water or report to the board on water conservation. Water conservation includes restrictions or limitations on particular uses of water or a reduction in the amount of water used or served, but does not include curtailment of diversions when water is not available under the diverter's priority of right or reporting requirements related to curtailments.

SEC. 4. Section 1120 of the Water Code is amended to read:

1120. This chapter applies to any decision or order issued under this part or Section 275, Part 2 (commencing with Section 1200), Part 2 (commencing with Section 10500) of Division 6, Part 2.55 (commencing with Section 10608) of Division 6, or Chapter 11 (commencing with Section 10735) of Part 2.74 of Division 6, Article 7 (commencing with Section 13550) of Chapter 7 of Division 7, or the public trust doctrine.

SEC. 5. Section 10608.12 of the Water Code is amended to read:

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "CII water use" means water used by commercial water users, industrial water users, institutional water users, and large landscape water users.

(e) "Commercial water user" means a water user that provides or distributes a product or service.

(f) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(g) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(h) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(i) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(j) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(k) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(l) "Large landscape" means a nonresidential landscape as described in the performance measures for CII water use adopted pursuant to Section 10609.10.

(m) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(n) "Performance measures" means actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users. Performance measures may include, but are not limited to, educating CII water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not include process water.

(o) "Potable reuse" means direct potable reuse, indirect potable reuse for groundwater recharge, and reservoir water augmentation as those terms are defined in Section 13561.

(p) "Process water" means water used by industrial water users for producing a product or product content or water used for research and development. Process water includes, but is not limited to, continuous manufacturing processes, and water used for testing, cleaning, and maintaining equipment. Water used to cool machinery or buildings used in the manufacturing process or necessary to maintain product quality or chemical characteristics for product manufacturing or control rooms, data centers, laboratories, clean rooms, and other industrial facility units that are integral to the manufacturing or research and development process is process water. Water used in the manufacturing process that is necessary for complying with local, state, and federal health and safety laws, and is not incidental water, is process water. Process water does not mean incidental water uses.

(q) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050.

(r) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(s) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(t) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(u) "Urban water use objective" means an estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, as described in Section 10609.20.

(v) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(w) "Urban wholesale water ~~supplier"~~ *supplier,"* means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

SEC. 6. Section 10608.20 of the Water Code is amended to read:

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's ~~2017~~ *2016* report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its ~~internet website,~~ *Internet Web site,* and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

(2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

SEC. 7. *Section 10608.35 is added to the Water Code, to read:*

10608.35. *(a) The department, in coordination with the board, shall conduct necessary studies and investigations and make a recommendation to the Legislature, by January 1, 2020, on the feasibility of developing and enacting water loss reporting requirements for urban wholesale water suppliers.*

(b) The studies and investigations shall include an evaluation of the suitability of applying the processes and requirements of Section 10608.34 to urban wholesale water suppliers.

(c) In conducting necessary studies and investigations and developing its recommendation, the department shall solicit broad public participation from stakeholders and other interested persons.

SEC. 8. *Section 10609.20 is added to the Water Code, immediately following Section 10609.18, to read:*

10609.20. *(a) Each urban retail water supplier shall calculate its urban water use objective no later than November 1, 2023, and by November 1 every year thereafter.*

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

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

(1) Aggregate estimated efficient indoor residential water use.

(2) Aggregate estimated efficient outdoor residential water use.

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

(4) Aggregate estimated efficient water losses.

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

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

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

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

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

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

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

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

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

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

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

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

SEC. 9. *Section 10609.22 is added to the Water Code, to read:*

10609.22. *(a) An urban retail water supplier shall calculate its actual urban water use no later than November 1, 2023, and by November 1 every year thereafter.*

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

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

(1) Aggregate residential water use.

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

(3) Aggregate water losses.

SEC. 10. *Section 10609.24 is added to the Water Code, to read:*

10609.24. *(a) An urban retail water supplier shall submit a report to the department no later than November 1, 2023, and by November 1 every year thereafter. The report shall include all of the following:*

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

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

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

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

(b) The department shall post the reports and information on its Internet Web site.

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

SEC. 11. *Section 10609.26 is added to the Water Code, to read:*

10609.26. *(a) (1) On and after November 1, 2023, the board may issue informational orders pertaining to water production, water use, and water conservation to an urban retail water supplier that does not meet its urban water use objective required by this chapter. Informational orders are intended to obtain information on supplier activities, water production, and conservation efforts in order to identify technical assistance needs and assist urban water suppliers in meeting their urban water use objectives.*

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

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

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

(b) On and after November 1, 2024, the board may issue a written notice to an urban retail water supplier that does not meet its urban water use objective required by this chapter. The written notice may warn the urban retail water supplier that it is not meeting its urban water use objective described in Section 10609.20 and is not making adequate progress in meeting the urban water use objective, and may request that the urban retail water supplier address areas of concern in its next annual report required by Section 10609.24. In deciding whether to issue a written notice, the board may consider whether the urban retail water supplier has received an informational order, the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet its urban water use objective.

(c) (1) On and after November 1, 2025, the board may issue a conservation order to an urban retail water supplier that does not meet its urban water use objective. A conservation order may consist of, but is not limited to, referral to the department for technical assistance, requirements for education and outreach, requirements for local enforcement, and other efforts to assist urban retail water suppliers in meeting their urban water use objective.

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

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

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

SEC. 12. *Section 10609.28 is added to the Water Code, to read:*

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

SEC. 13. *Section 10609.30 is added to the Water Code, to read:*

10609.30. *On or before January 10, 2024, the Legislative Analyst shall provide to the appropriate policy committees of both houses of the Legislature and the public a report evaluating the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. The board and the department shall provide the Legislative Analyst with the available data to complete this report.*

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

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

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

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

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

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

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

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

SEC. 14. *Section 10609.32 is added to the Water Code, to read:*

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

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

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

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

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

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

(f) An assessment of how implementing this chapter is affecting the efficiency of statewide urban water use.

SEC. 15. *Section 10609.34 is added to the Water Code, to read:*

10609.34. *Notwithstanding Section 15300.2 of Title 14 of the California Code of Regulations, an action of the board taken under this chapter shall be deemed to be a Class 8 action, within the meaning of Section 15308 of Title 14 of the California Code of Regulations, provided that the action does not involve relaxation of existing water conservation or water use standards.*

SEC. 16. *Section 10609.36 is added to the Water Code, to read:*

10609.36. *(a) Nothing in this chapter shall be construed to determine or alter water rights. Sections 1010 and 1011 apply to water conserved through implementation of this chapter.*

(b) Nothing in this chapter shall be construed to authorize the board to update or revise water use efficiency standards authorized by this chapter except as explicitly provided in this chapter. Authorization to update the standards beyond that explicitly provided in this chapter shall require separate legislation.

(c) Nothing in this chapter shall be construed to limit or otherwise affect the use of recycled water as seawater barriers for groundwater salinity management.

SEC. 17. *Section 10609.38 is added to the Water Code, to read:*

10609.38. The board may waive the requirements of this chapter for a period of up to five years for any urban retail water supplier whose water deliveries are significantly affected by changes in water use as a result of damage from a disaster such as an earthquake or fire. In establishing the period of a waiver, the board shall take into consideration the breadth of the damage and the time necessary for the damaged areas to recover from the disaster.

SEC. 18. Section 10610.2 of the Water Code is amended to read:

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

SEC. 19. Section 10610.4 of the Water Code is amended to read:

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to achieve the efficient use of available supplies and strengthen local drought planning.

SEC. 20. Section 10612 of the Water Code is amended and renumbered to read:

~~**10612.**~~ ***10611.3.*** ~~"Drought risk assessment"~~ *"Customer"* means a ~~method that examines water shortage risks based on the driest five-year historic sequence for the agency's water supply, as described in subdivision (b) of Section 10635.~~ *purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.*

SEC. 21. *Section 10612 is added to the Water Code, to read:*

10612. *"Drought risk assessment" means a method that examines water shortage risks based on the driest five-year historic sequence for the agency's water supply, as described in subdivision (b) of Section 10635.*

SEC. 22. *Section 10617.5 is added to the Water Code, to read:*

10617.5. *"Water shortage contingency plan" means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.*

SEC. 23. *Section 10618 is added to the Water Code, to read:*

10618. *"Water supply and demand assessment" means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.*

SEC. 24. Section 10620 of the Water Code is amended to read:

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

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

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation, efficient water use, and improved local drought resilience.

(2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.

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

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

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

SEC. 25. Section 10621 of the Water Code is amended to read:

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

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

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

(e) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

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

(2) By January 1, 2024, each urban retail water supplier shall adopt and submit to the department a supplement to the adopted 2020 plan that includes information required pursuant to subparagraph (B) of paragraph (1) of subdivision (e) of Section 10631. This supplement is not an update or an amendment to the plan and, therefore, an urban water supplier is not required to comply with the public notice, hearing, and adoption requirements of Section 10642 before submitting the information to the department.

SEC. 26. Section 10630 of the Water Code is amended to read:

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.

SEC. 27. *Section 10630.5 is added to the Water Code, to read:*

10630.5. *Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.*

SEC. 28. Section 10631 of the Water Code is amended to read:

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

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

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

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

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

(3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

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

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

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

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

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

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

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

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

(I) Agricultural.

(J) Distribution system water loss.

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

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

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

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

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

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

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

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

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

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

(B) For the supplement required of urban retail water suppliers by paragraph (2) of subdivision (f) of Section 10621, a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027, pursuant to Chapter 9 (commencing with Section 10609) of Part 2.55.

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

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

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

(vi) Water conservation program coordination and staffing support.

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

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph ~~(B)~~ *(C)* of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

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

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

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

SEC. 29. Section 10631.2 of the Water Code is amended to read:

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

SEC. 30. Section 10631.7 of the Water Code is repealed.

SEC. 31. Section 10632 of the Water Code is repealed.

~~**10632.** (a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:~~

~~(1) The analysis of water supply reliability conducted pursuant to Section 10635.~~

~~(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:~~

~~(A) The written decisionmaking process that an urban water supplier will use each year to determine its water supply reliability.~~

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

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

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

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

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

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

~~(3) (A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.~~

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

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

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

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

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

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

(C) Any other relevant communications.

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

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

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

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

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

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

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

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

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

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

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes,

~~waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.~~

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

SEC. 32. *Section 10632 is added to the Water Code, to read:*

10632. *(a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:*

(1) The analysis of water supply reliability conducted pursuant to Section 10635.

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

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

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

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

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

(iii) Existing infrastructure capabilities and plausible constraints.

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

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

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

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

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

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

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

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

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

(C) Any other relevant communications.

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

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

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

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

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

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

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

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

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

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

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

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

SEC. 33. *Section 10632.1 is added to the Water Code, to read:*

10632.1. *An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before June 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by June 1 of each year, whichever is later.*

SEC. 34. *Section 10632.2 is added to the Water Code, to read:*

10632.2. *An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative*

actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

SEC. 35. *Section 10632.3 is added to the Water Code, to read:*

10632.3. *It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.*

SEC. 36. Section 10635 of the Water Code is amended to read:

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

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

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

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

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

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

(d) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(e) Nothing in this article is intended to change existing law concerning an urban water supplier’s obligation to provide water service to its existing customers or to any potential future customers.

SEC. 37. Section 10640 of the Water Code is amended to read:

10640. (a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water

shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

SEC. 38. Section 10641 of the Water Code is amended to read:

10641. An urban water supplier required to prepare a plan or a water shortage contingency plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

SEC. 39. Section 10642 of the Water Code is amended to read:

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

SEC. 40. Section 10644 of the Water Code is amended to read:

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

(c) (1) (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before July 1, in the years ending in seven and two, a report summarizing the status of the plans and water shortage contingency plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans and water shortage contingency plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan and water shortage contingency plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans and water shortage contingency plans submitted pursuant to this part.

(B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.

(C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.

(2) A report to be submitted pursuant to subparagraph (A) of paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(d) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

SEC. 41. Section 10645 of the Water Code is amended to read:

10645. (a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

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

SEC. 42. Section 10650 of the Water Code is amended to read:

10650. Any actions or proceedings, other than actions by the board, to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan or a water shortage contingency plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan or water shortage contingency plan, or action taken pursuant to either, does not comply with this part shall be commenced within 90 days after filing of the plan or water shortage contingency plan or an amendment to either pursuant to Section 10644 or the taking of that action.

SEC. 43. Section 10651 of the Water Code is amended to read:

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan or a water shortage contingency plan, or an action taken pursuant to either by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

SEC. 44. Section 10653 of the Water Code is amended to read:

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the board and the Public Utilities Commission, for the preparation of water management plans, water shortage contingency plans, or conservation plans; provided, that if the board or the Public Utilities Commission requires additional information concerning water conservation, drought response measures, or financial conditions to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan that complies with analogous federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

SEC. 45. Section 10654 of the Water Code is amended to read:

10654. An urban water supplier may recover in its rates the costs incurred in preparing its urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency plan and implementing the reasonable water conservation measures included in either of the plans.

SEC. 46. Section 10656 of the Water Code is amended to read:

10656. An urban water supplier is not eligible for a water grant or loan awarded or administered by the state unless the urban water supplier complies with this part.

SEC. 47. *Section 10657 is added to the Water Code, to read:*

10657. *The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement this part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.*

SEC. 48. *This act shall become operative only if Assembly Bill 1668 of the 2017–18 Regular Session is enacted and becomes effective.*

Appendix B

AWE Model Assumptions

AWE CONSERVATION TRACKING TOOL: COMMON ASSUMPTIONS WORKSHEET

Getting Started: On this worksheet you enter information the tracking tool needs to operate. This includes specifying whether to use English or Metric units, setting up customer classes, specifying the first year for forecasts, entering forecasted population, housing, and customer accounts, setting financial assumptions, providing information needed to calculate water and energy savings due to appliance and plumbing standards for toilets, clothes washers, and dishwashers, and providing information needed to calculate water savings for landscape conservation measures included in the conservation measure library. It sounds like a lot, but you probably have developed much of this data for other planning purposes.

Scenario '''Empty'' loaded into model on 7/27/2016 5:44:04 PM

State	CA
Volume Units	Acre-Feet (AF)

Model will use CA plumbing standards	
Flow Units Will Be:	MGD

Population, Housing, and Account Forecasts

Population Estimate with ABAG Growth Rate per NMWD adjusted for RHNA requirements

Enter Starting Year for Forecasts: 2010

Sector growth per pop and empl, and 2020 Sector per Pop only

Population & Housing	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Population	59,861	61,381	61,658	63,389	65,440	67,838	68,631	69,432
Single Family Dwelling Units	15,888	16,103	16,176	16,630	17,168	17,797	18,005	18,215
Multi Family Dwelling Units	8,240	8,360	8,398	8,633	8,913	9,239	9,347	9,457
Number of Accounts								
Single Family	14,754	14,821	14,888	15,280	15,775	16,353	16,544	16,737
Multi Family	3,701	3,702	3,719	3,811	3,934	4,078	4,126	4,174
Commercial	829	811	815	821	840	850	852	853
Institutional	94	100	100	100	103	104	104	104
Irrigation	434	450	452	361	369	373	374	375
Mobile Home	102	103	103	105	108	112	114	115
Pool	91	93	93	95	98	101	102	104
Other	428	428	430	476	487	492	493	494
Not in use								

Financial Assumptions

These inputs are used by the tracking tool to standardize costs and benefits, calculate present values, and estimate utility and customer benefits of conservation.

Dollar Base Year	2020
Annual Inflation Rate	3.0%
Nominal Interest Rate	2.3%

Utility Rates in 2010	**Average Class Rate (2020 Dollars)**				**Annual Rate of Increase**			
	Water	Sewer	Electricity	Gas	Water	Sewer	Electricity	Gas

Customer Class	($/Thou Gal)	($/Thou Gal)	($/KWh)	($/Therm)	(%/Yr)	(%/Yr)	(%/Yr)	(%/Yr)
Single Family	$5.42		$0.28	$2.00	6.0%		3.0%	3.0%
Multi Family	$5.42		$0.28	$2.00	6.0%		3.0%	3.0%
Commercial	$6.16		$0.27	$0.80	6.0%		3.0%	3.0%
Institutional	$6.16		$0.20	$0.76	6.0%		3.0%	3.0%
Irrigation	$6.16		$0.31		6.0%		3.0%	3.0%
Mobile Home	$5.42		$0.28	$2.00	6.0%		3.0%	3.0%
Pool	$6.16		$0.28	$2.00	6.0%		3.0%	3.0%
Other	$6.16				6.0%		3.0%	3.0%
Not in use								

Information Needed to Calculate Water/Energy Savings from Plumbing/Appliance Standards

These inputs are used by the tracking tool to estimate water and energy savings for national toilet and showerhead standards, which first took effect in 1994, and clothes washer and dishwasher appliance standards, which first included maximum allowable water factors in 2011 and 2010, respectively. Toilet standards took effect in 1992 in California and Texas.

	Single Family	Multi Family
Persons per household	2.57	2.57
Full Baths/Dwelling Unit	2.01	1.68
Half Baths/Dwelling Unit	0.24	0.59
Dwellling Units in 1992	15,986	4,951

Population in 1990 54,603

Information Needed to Calculate Water Savings for Landscape Measures in Library

Average landscape water use for residential and non-residential sites is used by the model to calculate water savings for various landscape conservation measures included in the program library. Average landscape water use is calculated using the following equation. Alternatively, you can use your own landscape water use estimate by selecting the "Use My Own Estimate" option.

$$use\ per\ site = \left(\frac{1}{irr.eff.}\right) \times (ET_0 \times K_L - R_e)\ \times Area \times C_v, where$$

$irr.eff. = typical\ irrigation\ efficiency$
$ET_0 = reference\ evapotranspiration$
$K_L = landscape\ coefficient\ (\%\ of ET_0\ needed\ by\ crop)$
$R_e = effective\ rainfall\ (\%\ of\ annual\ rainfall\ contributing\ to\ plant\ water\ requirement)$
$C_v = coefficient\ that\ converts\ water\ use\ to\ appropriate\ volume\ units\ (gal\ for\ english\ units, M^3 for\ metric\ units)$

○ Use my own landscape water use estimates ◉ Use model's landscape water use calculator

Reference ET in/yr 43.00

Avg Annual Rainfall	in/yr	29.63
Effective Rainfall	%	25%

Landscape Water Requirement Coefficient (K_L)

Turf	% of ET_0	80%
Other than turf	% of ET_0	40%

		Residential	Non Residential	
Avg Landscape Area Per Site	ft^2			
Avg Turf Area (% of Total)	%			
Avg Irrigation Efficiency (%)	%	75%	81%	Drip Irrigation Saving Estimates

Irrigation Requirement		Residential	Non Residential
Turf Area	in/ft^2/yr	36	33
Other	in/ft^2/yr	13	12

Drip Irrigation Saving Estimates
2.665925926 in/ft^2/yr

Avg Landscape Water Use Per Site		Residential	Non Residential
Turf Area	Gal/Yr	0	0
Other	Gal/Yr	0	0
Total	Gal/Yr	**0**	**0**

AWE CONSERVATION TRACKING TOOL: ENTER UTILITY AVOIDED COSTS WORKSHEET

Enter utility avoided costs: The primary benefit of conservation to the utility and its ratepayers is avoiding future water supply and wastewater costs. A utility avoids cost by not having to purchase (or otherwise acquire), transport, treat and distribute water supply, and by not having to collect, treat, and dispose of wastewater. The variable costs of these activities are major components of avoided cost. Conservation, if done at sufficient scale, may also allow the utility to defer or even entirely avoid future expansion of system capacity. This can be a major source of benefit in some cases.

The tracking tool comes with a calculator you can use to estimate your avoided costs. Alternatively, you can enter you own avoided cost estimates by selecting

Scenario '"Empty" loaded into model on 7/27/2016 5:44:04 PM

Download CUWCC Avoided Cost & Environmental Benefits Models

○ Use my own avoided cost estimates ◉ Use model's avoided cost calculator

Tracking Tool Utility Avoided Cost Calculator

Water and Wastewater System Variable Costs (2020 Dollars)

	Water		Wastewater	
	$/AF	Nominal Increase	$/AF	Nominal Increase
Water purchase	$937	6.0%	NA	NA
Energy	$58	3.0%		
Chemicals				
Other variable cost	$153	3.0%		
Total	**$1,148**	**5.5%**	**$0**	**0.0%**

Variable Cost Forecast

Variable Cost	Units	2010	2015	2020	2025	2030	2035	2040	2045	2040-2045 Ann Grwth %
Water Supply	$/AF	$1,148	$1,295	$1,461	$1,648	$1,860	$2,098	$2,367	$2,670	2.4%
Wastewater	$/AF	$0	$0	$0	$0	$0	$0	$0	$0	0.0%

Define conservation activities: Click the Define/Edit/Delete button to setup and edit conservation activities. You can use the form to define your own activities or import activities from the tracking tool's library. Once imported, library activities can be customized. Conservation activity specifications are stored in a table on this worksheet. This table is hidden by default. You can unhide the table by clicking the "Show Activities Table" button. You can edit activities directly in the table if you find this easier than using the form. HOWEVER, DO NOT DELETE TABLE ROWS. ONLY USE THE FORM TO DELETE CONSERVATION ACTIVITIES.

Scenario '"Empty" loaded into model on 7/27/2016 5:44:04 PM

NOTE: You can define activities in the table rather than using the form. BUT ONLY USE THE FORM TO DELETE ACTIVITIES.

Activity ID	Activity Name	Class	Savings, Per Unit (gpy)	Savings, Annual Rate of Decay (%)	Savings, Peak Period (% of Annual Savings)	Savings, Useful Life (yrs)	Savings, Participant Free Riders (% of Participants)	Utility Costs, Year Denominated	Utility Costs, Initial Fixed ($)	Utility Costs, Initial Variable ($/unit)	Utility Costs, Years of Follow-up (yrs)	Utility Costs, Follow-up Fixed ($/yr)	Utility Costs, Follow-up Variable ($/unit/yr)	Participant Costs, Year Denominated	Participant Costs, Initial ($)	Participant Costs, Years of On-going (yrs)	Participant Costs, On-going ($/Yr)	Participant Savings, Sewer (gpy)	Participant Savings, Gas (Therms/Gal)	Participant Savings, Electricity (KWh/Gal)	Plumbing Code, Year Effective	Plumbing Code, Unit Savings (gpy)	Plumbing Code, Natural Replacement Rate NRR (%)
1	Water Use Surveys/Audits - SFR	Single Family	12,826	20%	68%	5	0%	2020		$210.60				2020	$50.00			4,949.20	0.0010	0.0000	0	0	0.00%
2	Water Use Surveys/Audits - CII	Commercial	117,207	20%		5	0%	2020		$2,000.00				2020	$2,500.00								
3	Mulch rebate	Single Family	12	0%	80%	5	0%	2020		$0.33				2020	$0.10			0.00	0.0000	0.0000	0	0	0.00%
4	High Efficiency Clothes Washer Rebate - Residentia	Single Family	5,189	0%	0%	15	0%	2020		$65.00				2020	$750.00			5,000.00	0.0035	0.0036	2011	3500	7.14%
5	Landscape Conversion or Turf Removal -SFR	Single Family	12	0%	80%	10	0%	2020		$0.65				2020	$1.50			0.00	0.0000	0.0000	0	0	0.00%
6	Smart Irrigation Controller (Weather-Based Irrigation	Single Family	18,469	0%	70%	10	0%	2020		$325.00				2020	$250.00			0.00	0.0000	0.0000	0	0	0.00%
7	Smart Irrigation Controller (Weather-Based Irrigation	Commercial	18,469	0%	70%	10	0%	2020		$525.72				2020	$2,595.60			0.00	0.0000	0.0000	0	0	0.00%
8	Landscape Conversion or Turf Removal - MFR and (	Irrigation	12	0%	80%	10	0%	2020		$0.65				2020	$1.50			0.00	0.0000	0.0000	0	0	0.00%
9	UHET <1.0 gal/flush Rebate - Residential	Single Family	7,860	0%	0%		0%	2020		$195.00				2020	$100.00			7,859.55	0.0000	0.0000	1994	7859.551534	4.00%
10	Drip Irrigation Incentive for MFR and CII	Multi Family	4,415	0%		12	0%	2020		$406.25				2020	$312.50								
11	Drip Irrigation Incentive for SFR	Single Family	1,440	0%		12	0%	2020		$325.00				2020	$250.00								
12	Incentivize Irrigation Equipment Upgrades - SFR	Single Family	9,128	0%		10	0%	2020		$325.00				2020	$250.00								
13	High Efficiency Faucet Aerator / Showerhead Giveav	Single Family	2,190	0%		5	0%	2020		$31.20				2020	$50.00								
14	Restaurant Spray Nozzle Rebates	Commercial	43,830	0%		5	0%	2020		$65.00				2020	$50.00			43,830.00	0.0083				
15																							
16																							
17																							

AWE CONSERVATION TRACKING

Enter annual conservation activity: Use this worksheet to enter the annual activity levels for the conservation activities you defined on the 4. Define Activities worksheet. You can enter activity through the end of your forecast period, but this is not required. It is okay to enter activity for shorter periods. You also can start an activity in

Enter Annual Conservation Activity

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	295	295	295	295	295																				
2	Commercial	Water Use Surveys/Audits - CII	13	13	13	13	13																				
3	Single Family	Mulch rebate	55062	55062	55062	55062	55062																				
4	Single Family	High Efficiency Clothes Washer Rebate - Res	261	261	261	261	261																				
5	Single Family	Landscape Conversion or Turf Removal -SFR	55062	55062	55062	55062	55062																				
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	11	11	11	11	11																				
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	6	6	6	6	6																				
8	Irrigation	Landscape Conversion or Turf Removal - MF	4462.75	4462.75	4462.75	4462.75	4462.75																				
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	200	200	200	200	200																				
10	Multi Family	Drip Irrigation Incentive for MFR and CII	10	10	10	10	10																				
11	Single Family	Drip Irrigation Incentive for SFR	20	20	20	20	20																				
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	10	10	10	10	10																				
13	Single Family	High Efficiency Faucet Aerator / Showerhead	200	200	200	200	200																				
14	Commercial	Restaurant Spray Nozzle Rebates	20	20	20	20	20																				

Annual Program Overhead Cost (2020 dollars)	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Enter additional program cost not included in activity definitions																									

Model calculation tables below this line. Do not delete or modify.

Effective Conservation Activity

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	295	531	720	871	992	697	461	272	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Commercial	Water Use Surveys/Audits - CII	13	23	32	38	44	31	20	12	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Single Family	Mulch rebate	55,062	110,124	165,186	220,248	275,310	220,248	165,186	110,124	55,062	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	261	522	783	1,044	1,305	1,305	1,305	1,305	1,305	1,305	1,305	1,305	1,305	1,305	1,305	1,044	783	522	261	0	0	0	0	0	0
5	Single Family	Landscape Conversion or Turf Removal -SFR	55,062	110,124	165,186	220,248	275,310	275,310	275,310	275,310	275,310	275,310	220,248	165,186	110,124	55,062	0	0	0	0	0	0	0	0	0	0	0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	11	22	33	44	55	55	55	55	55	55	44	33	22	11	0	0	0	0	0	0	0	0	0	0	0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	6	12	18	24	30	30	30	30	30	30	24	18	12	6	0	0	0	0	0	0	0	0	0	0	0
8	Irrigation	Landscape Conversion or Turf Removal - MF	4,463	8,926	13,388	17,851	22,314	22,314	22,314	22,314	22,314	22,314	17,851	13,388	8,926	4,463	0	0	0	0	0	0	0	0	0	0	0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	200	400	600	800	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
10	Multi Family	Drip Irrigation Incentive for MFR and CII	10	20	30	40	50	50	50	50	50	50	50	50	40	30	20	10	0	0	0	0	0	0	0	0	0
11	Single Family	Drip Irrigation Incentive for SFR	20	40	60	80	100	100	100	100	100	100	100	100	80	60	40	20	0	0	0	0	0	0	0	0	0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	10	20	30	40	50	50	50	50	50	50	40	30	20	10	0	0	0	0	0	0	0	0	0	0	0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	200	400	600	800	1000	800	600	400	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Commercial	Restaurant Spray Nozzle Rebates	20	40	60	80	100	80	60	40	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Gross Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	11.6	20.9	28.3	34.3	39.0	27.4	18.1	10.7	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	4.7	8.4	11.4	13.8	15.7	11.0	7.3	4.3	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	2.0	4.1	6.1	8.1	10.1	8.1	6.1	4.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	4.2	8.3	12.5	16.6	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	16.6	12.5	8.3	4.2	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	2.0	4.1	6.1	8.1	10.1	10.1	10.1	10.1	10.1	10.1	8.1	6.1	4.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.6	1.2	1.9	2.5	3.1	3.1	3.1	3.1	3.1	3.1	2.5	1.9	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.3	0.7	1.0	1.4	1.7	1.7	1.7	1.7	1.7	1.7	1.4	1.0	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.2	0.3	0.5	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	4.8	9.6	14.5	19.3	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.1	0.3	0.4	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.3	0.6	0.8	1.1	1.4	1.4	1.4	1.4	1.4	1.4	1.1	0.8	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	1.3	2.7	4.0	5.4	6.7	5.4	4.0	2.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	2.7	5.4	8.1	10.8	13.5	10.8	8.1	5.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Gross Water Savings		**35.0**	**66.7**	**95.8**	**122.9**	**148.3**	**125.9**	**106.8**	**90.3**	**75.9**	**63.2**	**59.8**	**56.3**	**52.7**	**49.0**	**45.3**	**41.0**	**36.6**	**32.4**	**28.3**	**24.1**	**24.1**	**24.1**	**24.1**	**24.1**	**24.1**

Peak Gross Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	7.9	14.2	19.3	23.3	26.5	18.6	12.3	7.3	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	1.6	3.2	4.9	6.5	8.1	6.5	4.9	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

4	Single Family	High Efficiency Clothes Washer Rebate - Res	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	1.6	3.2	4.9	6.5	8.1	8.1	8.1	8.1	8.1	8.1	6.5	4.9	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.4	0.9	1.3	1.7	2.2	2.2	2.2	2.2	2.2	2.2	1.7	1.3	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.2	0.5	0.7	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.0	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.1	0.3	0.4	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Gross Water Savings		**11.9**	**22.3**	**31.4**	**39.5**	**46.8**	**37.3**	**29.3**	**22.7**	**17.0**	**12.1**	**9.7**	**7.3**	**4.9**	**2.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Off Peak Gross Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	3.7	6.7	9.1	11.0	12.5	8.8	5.8	3.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	4.7	8.4	11.4	13.8	15.7	11.0	7.3	4.3	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	0.4	0.8	1.2	1.6	2.0	1.6	1.2	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	4.2	8.3	12.5	16.6	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	16.6	12.5	8.3	4.2	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	0.4	0.8	1.2	1.6	2.0	2.0	2.0	2.0	2.0	2.0	1.6	1.2	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.2	0.4	0.6	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	4.8	9.6	14.5	19.3	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.1	0.3	0.4	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.3	0.6	0.8	1.1	1.4	1.4	1.4	1.4	1.4	1.4	1.1	0.8	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	1.3	2.7	4.0	5.4	6.7	5.4	4.0	2.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	2.7	5.4	8.1	10.8	13.5	10.8	8.1	5.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Gross Water Savings		**23.0**	**44.4**	**64.4**	**83.4**	**101.5**	**88.6**	**77.5**	**67.7**	**58.9**	**51.1**	**50.1**	**49.0**	**47.8**	**46.6**	**45.3**	**41.0**	**36.6**	**32.4**	**28.3**	**24.1**	**24.1**	**24.1**	**24.1**	**24.1**	**24.1**

Active Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	11.6	20.9	28.3	34.3	39.0	27.4	18.1	10.7	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	4.7	8.4	11.4	13.8	15.7	11.0	7.3	4.3	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	2.0	4.1	6.1	8.1	10.1	8.1	6.1	4.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	4.2	8.1	11.9	15.5	18.9	18.0	17.2	16.5	15.8	15.2	14.6	14.0	13.5	13.0	12.6	9.9	7.3	4.8	2.3	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	2.0	4.1	6.1	8.1	10.1	10.1	10.1	10.1	10.1	10.1	8.1	6.1	4.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.6	1.2	1.9	2.5	3.1	3.1	3.1	3.1	3.1	3.1	2.5	1.9	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.3	0.7	1.0	1.4	1.7	1.7	1.7	1.7	1.7	1.7	1.4	1.0	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.2	0.3	0.5	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	4.8	9.5	13.9	18.2	22.3	21.4	20.5	19.7	18.9	18.2	17.4	16.7	16.1	15.4	14.8	14.2	13.6	13.1	12.6	12.1	11.6	11.1	10.7	10.3	9.8
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.1	0.3	0.4	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.3	0.6	0.8	1.1	1.4	1.4	1.4	1.4	1.4	1.4	1.1	0.8	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	1.3	2.7	4.0	5.4	6.7	5.4	4.0	2.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	2.7	5.4	8.1	10.8	13.5	10.8	8.1	5.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Active Water Savings		**35.0**	**66.3**	**94.7**	**120.6**	**144.5**	**120.4**	**99.7**	**81.6**	**65.7**	**51.6**	**46.8**	**42.2**	**37.3**	**32.5**	**27.8**	**24.3**	**20.9**	**17.9**	**14.9**	**12.1**	**11.6**	**11.1**	**10.7**	**10.3**	**9.8**

Peak Active Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	7.9	14.2	19.3	23.3	26.5	18.6	12.3	7.3	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	1.6	3.2	4.9	6.5	8.1	6.5	4.9	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	1.6	3.2	4.9	6.5	8.1	8.1	8.1	8.1	8.1	8.1	6.5	4.9	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.4	0.9	1.3	1.7	2.2	2.2	2.2	2.2	2.2	2.2	1.7	1.3	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.2	0.5	0.7	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.0	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.1	0.3	0.4	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Active Water Savings		**11.9**	**22.3**	**31.4**	**39.5**	**46.8**	**37.3**	**29.3**	**22.7**	**17.0**	**12.1**	**9.7**	**7.3**	**4.9**	**2.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Off Peak Active Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	3.7	6.7	9.1	11.0	12.5	8.8	5.8	3.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	4.7	8.4	11.4	13.8	15.7	11.0	7.3	4.3	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	0.4	0.8	1.2	1.6	2.0	1.6	1.2	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	4.2	8.1	11.9	15.5	18.9	18.0	17.2	16.5	15.8	15.2	14.6	14.0	13.5	13.0	12.6	9.9	7.3	4.8	2.3	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	0.4	0.8	1.2	1.6	2.0	2.0	2.0	2.0	2.0	2.0	1.6	1.2	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.2	0.4	0.6	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	4.8	9.5	13.9	18.2	22.3	21.4	20.5	19.7	18.9	18.2	17.4	16.7	16.1	15.4	14.8	14.2	13.6	13.1	12.6	12.1	11.6	11.1	10.7	10.3	9.8
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.1	0.3	0.4	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.3	0.6	0.8	1.1	1.4	1.4	1.4	1.4	1.4	1.4	1.1	0.8	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	1.3	2.7	4.0	5.4	6.7	5.4	4.0	2.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	2.7	5.4	8.1	10.8	13.5	10.8	8.1	5.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Active Water Savings		**23.0**	**44.0**	**63.3**	**81.1**	**97.8**	**83.2**	**70.3**	**59.0**	**48.7**	**39.5**	**37.1**	**34.9**	**32.5**	**30.1**	**27.8**	**24.3**	**20.9**	**17.9**	**14.9**	**12.1**	**11.6**	**11.1**	**10.7**	**10.3**	**9.8**

Passive Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	0.0	0.2	0.6	1.1	1.9	2.7	3.5	4.3	5.0	5.6	6.2	6.8	7.3	7.8	8.2	6.8	5.2	3.5	1.8	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	0.0	0.2	0.6	1.1	1.9	2.7	3.6	4.4	5.2	6.0	6.7	7.4	8.1	8.7	9.3	9.9	10.5	11.0	11.5	12.0	12.5	13.0	13.4	13.9	14.3
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Passive Water Savings		**0.0**	**0.4**	**1.2**	**2.3**	**3.7**	**5.5**	**7.1**	**8.7**	**10.2**	**11.6**	**12.9**	**14.2**	**15.4**	**16.5**	**17.5**	**16.7**	**15.7**	**14.6**	**13.4**	**12.0**	**12.5**	**13.0**	**13.4**	**13.9**	**14.3**

Peak Passive Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Passive Water Savings		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Off Peak Passive Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	0.0	0.2	0.6	1.1	1.9	2.7	3.5	4.3	5.0	5.6	6.2	6.8	7.3	7.8	8.2	6.8	5.2	3.5	1.8	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	0.0	0.2	0.6	1.1	1.9	2.7	3.6	4.4	5.2	6.0	6.7	7.4	8.1	8.7	9.3	9.9	10.5	11.0	11.5	12.0	12.5	13.0	13.4	13.9	14.3
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Passive Water Savings		**0.0**	**0.4**	**1.2**	**2.3**	**3.7**	**5.5**	**7.1**	**8.7**	**10.2**	**11.6**	**12.9**	**14.2**	**15.4**	**16.5**	**17.5**	**16.7**	**15.7**	**14.6**	**13.4**	**12.0**	**12.5**	**13.0**	**13.4**	**13.9**	**14.3**

Customer Water Bill Savings (2020 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	$28,357	$52,569	$73,390	$91,445	$107,247	$77,596	$52,844	$32,119	$14,702	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Commercial	Water Use Surveys/Audits - CII	$12,973	$24,050	$33,576	$41,836	$49,065	$35,500	$24,176	$14,695	$6,726	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Mulch rebate	$4,952	$10,200	$15,758	$21,638	$27,857	$22,952	$17,728	$12,172	$6,268	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	$10,150	$20,403	$30,779	$41,297	$51,975	$51,073	$50,251	$49,507	$48,839	$48,244	$47,722	$47,270	$46,886	$46,570	$46,318	$37,488	$28,461	$19,217	$9,737	$0	$0	$0	$0	$0	$0
5	Single Family	Landscape Conversion or Turf Removal -SFR	$4,952	$10,200	$15,758	$21,638	$27,857	$28,690	$29,547	$30,431	$31,341	$32,278	$26,594	$20,542	$14,104	$7,263	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	$1,523	$3,136	$4,845	$6,653	$8,565	$8,821	$9,085	$9,357	$9,636	$9,924	$8,177	$6,316	$4,337	$2,233	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

7	Commercial	Smart Irrigation Controller (Weather-Based Ir	$944	$1,943	$3,002	$4,123	$5,308	$5,466	$5,630	$5,798	$5,971	$6,150	$5,067	$3,914	$2,687	$1,384	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Irrigation	Landscape Conversion or Turf Removal - MF	$456	$939	$1,451	$1,992	$2,565	$2,642	$2,721	$2,802	$2,886	$2,972	$2,449	$1,891	$1,299	$669	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	$11,781	$23,781	$36,008	$48,470	$61,177	$60,486	$59,803	$59,127	$58,459	$57,799	$57,146	$56,501	$55,862	$55,231	$54,607	$53,991	$53,381	$52,778	$52,182	$51,592	$51,009	$50,433	$49,863	$49,300	$48,743
10	Multi Family	Drip Irrigation Incentive for MFR and CII	$331	$682	$1,053	$1,446	$1,862	$1,917	$1,975	$2,034	$2,094	$2,157	$2,221	$2,288	$1,885	$1,456	$1,000	$515	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	Single Family	Drip Irrigation Incentive for SFR	$216	$445	$687	$943	$1,215	$1,251	$1,288	$1,327	$1,366	$1,407	$1,449	$1,493	$1,230	$950	$652	$336	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	$684	$1,409	$2,177	$2,989	$3,849	$3,964	$4,082	$4,204	$4,330	$4,459	$3,674	$2,838	$1,949	$1,003	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	$3,283	$6,761	$10,445	$14,344	$18,466	$15,214	$11,752	$8,069	$4,155	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Commercial	Restaurant Spray Nozzle Rebates	$7,464	$15,374	$23,750	$32,613	$41,986	$34,593	$26,720	$18,346	$9,447	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Wastewater Savings		**$88,064**	**$171,892**	**$252,679**	**$331,429**	**$408,991**	**$350,164**	**$297,602**	**$249,987**	**$206,222**	**$165,391**	**$154,500**	**$143,053**	**$130,239**	**$116,759**	**$102,578**	**$92,329**	**$81,841**	**$71,995**	**$61,919**	**$51,592**	**$51,009**	**$50,433**	**$49,863**	**$49,300**	**$48,743**

Wastewater Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	4.5	8.1	10.9	13.2	15.1	10.6	7.0	4.1	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	4.0	7.8	11.4	14.9	18.2	17.4	16.6	15.9	15.2	14.6	14.0	13.5	13.0	12.5	12.1	9.5	7.0	4.6	2.3	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	4.8	9.5	13.9	18.2	22.3	21.4	20.5	19.7	18.9	18.2	17.4	16.7	16.1	15.4	14.8	14.2	13.6	13.1	12.6	12.1	11.6	11.1	10.7	10.3	9.8
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	2.7	5.4	8.1	10.8	13.5	10.8	8.1	5.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Wastewater Savings		**16.0**	**30.7**	**44.4**	**57.1**	**69.0**	**60.1**	**52.2**	**45.1**	**38.7**	**32.8**	**31.5**	**30.2**	**29.1**	**27.9**	**26.9**	**23.7**	**20.7**	**17.7**	**14.8**	**12.1**	**11.6**	**11.1**	**10.7**	**10.3**	**9.8**

Customer Sewer Bill Savings (2020 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Commercial	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Mulch rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Irrigation	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	Single Family	Drip Irrigation Incentive for SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Commercial	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Wastewater Savings		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Customer Electricity Savings (KWh)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Commercial	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Mulch rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	4,875.6	9,516.3	13,938.8	18,158.9	22,190.8	21,172.5	20,227.0	19,349.0	18,533.7	17,776.6	17,073.7	16,420.9	15,814.7	15,251.9	14,729.3	11,574.9	8,532.6	5,594.1	2,752.3	0.0	0.0	0.0	0.0	0.0	0.0
5	Single Family	Landscape Conversion or Turf Removal -SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Single Family	Drip Irrigation Incentive for SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Commercial	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Electricity Savings		**4,875.6**	**9,516.3**	**13,938.8**	**18,158.9**	**22,190.8**	**21,172.5**	**20,227.0**	**19,349.0**	**18,533.7**	**17,776.6**	**17,073.7**	**16,420.9**	**15,814.7**	**15,251.9**	**14,729.3**	**11,574.9**	**8,532.6**	**5,594.1**	**2,752.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Customer Electricity Bill Savings (2020 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Commercial	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Mulch rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	$1,356	$2,647	$3,878	$5,051	$6,173	$5,890	$5,627	$5,382	$5,156	$4,945	$4,750	$4,568	$4,399	$4,243	$4,097	$3,220	$2,374	$1,556	$766	$0	$0	$0	$0	$0	$0
5	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Irrigation	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

9	Single Family	UHET <1.0 gal/flush Rebate - Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	Single Family	Drip Irrigation Incentive for SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Commercial	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Electricity Savings		**$1,356**	**$2,647**	**$3,878**	**$5,051**	**$6,173**	**$5,890**	**$5,627**	**$5,382**	**$5,156**	**$4,945**	**$4,750**	**$4,568**	**$4,399**	**$4,243**	**$4,097**	**$3,220**	**$2,374**	**$1,556**	**$766**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Customer Gas Savings (Therms)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	3,623	6,522	8,841	10,696	12,180	8,557	5,658	3,339	1,484	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Commercial	Water Use Surveys/Audits - CII	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Single Family	Mulch rebate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	4,740	9,252	13,552	17,654	21,574	20,584	19,665	18,812	18,019	17,283	16,599	15,965	15,375	14,828	14,320	11,253	8,296	5,439	2,676	0	0	0	0	0	0
5	Single Family	Landscape Conversion or Turf Removal -SFR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Irrigation	Landscape Conversion or Turf Removal - MF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Single Family	Drip Irrigation Incentive for SFR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Commercial	Restaurant Spray Nozzle Rebates	7,305	14,610	21,915	29,220	36,525	29,220	21,915	14,610	7,305	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Gas Savings		**15,668**	**30,384**	**44,307**	**57,570**	**70,279**	**58,361**	**47,238**	**36,761**	**26,808**	**17,283**	**16,599**	**15,965**	**15,375**	**14,828**	**14,320**	**11,253**	**8,296**	**5,439**	**2,676**	**0**	**0**	**0**	**0**	**0**	**0**

Customer Gas Savings (2020 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	$7,254	$13,057	$17,700	$21,414	$24,385	$17,131	$11,328	$6,685	$2,971	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Commercial	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Mulch rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	$9,490	$18,523	$27,131	$35,345	$43,193	$41,211	$39,371	$37,662	$36,075	$34,601	$33,233	$31,963	$30,783	$29,687	$28,670	$22,530	$16,608	$10,889	$5,357	$0	$0	$0	$0	$0	$0
5	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Irrigation	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	Single Family	Drip Irrigation Incentive for SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Commercial	Restaurant Spray Nozzle Rebates	$5,873	$11,746	$17,619	$23,492	$29,365	$23,492	$17,619	$11,746	$5,873	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Gas Savings		**$22,617**	**$43,326**	**$62,450**	**$80,251**	**$96,943**	**$81,834**	**$68,318**	**$56,093**	**$44,919**	**$34,601**	**$33,233**	**$31,963**	**$30,783**	**$29,687**	**$28,670**	**$22,530**	**$16,608**	**$10,889**	**$5,357**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

User Entered Utility Avoided Water System Cost (2020 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Commercial	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Mulch rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Irrigation	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	Single Family	Drip Irrigation Incentive for SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Commercial	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

User Entered Utility Avoided Wastewater System Cost (2020 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Commercial	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Mulch rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Irrigation	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

11	Single Family	Drip Irrigation Incentive for SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Commercial	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

User Entered Other Utility Avoided Cost (2020 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Commercial	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Mulch rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Irrigation	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	Single Family	Drip Irrigation Incentive for SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Commercial	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Model Calculator Utility Water System Avoided Cost (2020 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	$17,402	$32,106	$44,582	$55,221	$64,344	$46,362	$31,423	$18,996	$8,644	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Commercial	Water Use Surveys/Audits - CII	$7,008	$12,929	$17,953	$22,237	$25,912	$18,670	$12,654	$7,650	$3,481	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Mulch rebate	$3,039	$6,230	$9,572	$13,067	$16,713	$13,713	$10,542	$7,199	$3,685	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	$6,229	$12,461	$18,697	$24,938	$31,183	$30,515	$29,880	$29,280	$28,714	$28,181	$27,760	$27,366	$26,998	$26,657	$26,342	$21,231	$16,042	$10,774	$5,427	$0	$0	$0	$0	$0	$0	$0
5	Single Family	Landscape Conversion or Turf Removal -SFR	$3,039	$6,230	$9,572	$13,067	$16,713	$17,141	$17,570	$17,998	$18,426	$18,854	$15,470	$11,892	$8,122	$4,157	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	$934	$1,915	$2,943	$4,018	$5,139	$5,270	$5,402	$5,534	$5,665	$5,797	$4,757	$3,657	$2,497	$1,278	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	$510	$1,045	$1,605	$2,191	$2,803	$2,875	$2,947	$3,018	$3,090	$3,162	$2,595	$1,994	$1,362	$697	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Irrigation	Landscape Conversion or Turf Removal - MF	$246	$505	$776	$1,059	$1,355	$1,389	$1,424	$1,459	$1,493	$1,528	$1,254	$964	$658	$337	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	$7,230	$14,524	$21,874	$29,270	$36,704	$36,139	$35,560	$34,970	$34,370	$33,762	$33,242	$32,710	$32,167	$31,615	$31,056	$30,578	$30,088	$29,589	$29,081	$28,567	$28,127	$27,676	$27,217	$26,750	$26,277
10	Multi Family	Drip Irrigation Incentive for MFR and CII	$203	$416	$640	$873	$1,117	$1,145	$1,174	$1,203	$1,231	$1,260	$1,292	$1,325	$1,085	$833	$569	$292	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	Single Family	Drip Irrigation Incentive for SFR	$132	$272	$417	$570	$729	$747	$766	$785	$803	$822	$843	$864	$708	$544	$371	$190	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	$420	$861	$1,322	$1,805	$2,309	$2,368	$2,427	$2,486	$2,546	$2,605	$2,137	$1,643	$1,122	$574	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	$2,014	$4,130	$6,345	$8,662	$11,079	$9,090	$6,988	$4,772	$2,443	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Commercial	Restaurant Spray Nozzle Rebates	$4,032	$8,265	$12,699	$17,335	$22,173	$18,193	$13,986	$9,551	$4,889	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$52,437**	**$101,887**	**$148,999**	**$194,312**	**$238,272**	**$203,618**	**$172,742**	**$144,902**	**$119,481**	**$95,972**	**$89,350**	**$82,415**	**$74,720**	**$66,694**	**$58,337**	**$52,291**	**$46,130**	**$40,362**	**$34,508**	**$28,567**	**$28,127**	**$27,676**	**$27,217**	**$26,750**	**$26,277**

Model Calculator Utility Wastewater System Avoided Cost (2020 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Commercial	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Mulch rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Irrigation	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Multi Family	Drip Irrigation Incentive for MFR and CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	Single Family	Drip Irrigation Incentive for SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Commercial	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Total Avoided Water and Wastewater Production Cost (2020 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	Water Use Surveys/Audits - SFR	$17,402	$32,106	$44,582	$55,221	$64,344	$46,362	$31,423	$18,996	$8,644	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Commercial	Water Use Surveys/Audits - CII	$7,008	$12,929	$17,953	$22,237	$25,912	$18,670	$12,654	$7,650	$3,481	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Mulch rebate	$3,039	$6,230	$9,572	$13,067	$16,713	$13,713	$10,542	$7,199	$3,685	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	High Efficiency Clothes Washer Rebate - Res	$6,229	$12,461	$18,697	$24,938	$31,183	$30,515	$29,880	$29,280	$28,714	$28,181	$27,760	$27,366	$26,998	$26,657	$26,342	$21,231	$16,042	$10,774	$5,427	$0	$0	$0	$0	$0	$0	$0
5	Single Family	Landscape Conversion or Turf Removal -SFR	$3,039	$6,230	$9,572	$13,067	$16,713	$17,141	$17,570	$17,998	$18,426	$18,854	$15,470	$11,892	$8,122	$4,157	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Single Family	Smart Irrigation Controller (Weather-Based Ir	$934	$1,915	$2,943	$4,018	$5,139	$5,270	$5,402	$5,534	$5,665	$5,797	$4,757	$3,657	$2,497	$1,278	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Commercial	Smart Irrigation Controller (Weather-Based Ir	$510	$1,045	$1,605	$2,191	$2,803	$2,875	$2,947	$3,018	$3,090	$3,162	$2,595	$1,994	$1,362	$697	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Irrigation	Landscape Conversion or Turf Removal - MF	$246	$505	$776	$1,059	$1,355	$1,389	$1,424	$1,459	$1,493	$1,528	$1,254	$964	$658	$337	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	UHET <1.0 gal/flush Rebate - Residential	$7,230	$14,524	$21,874	$29,270	$36,704	$36,139	$35,560	$34,970	$34,370	$33,762	$33,242	$32,710	$32,167	$31,615	$31,056	$30,578	$30,088	$29,589	$29,081	$28,567	$28,127	$27,676	$27,217	$26,750	$26,277
10	Multi Family	Drip Irrigation Incentive for MFR and CII	$203	$416	$640	$873	$1,117	$1,145	$1,174	$1,203	$1,231	$1,260	$1,292	$1,325	$1,085	$833	$569	$292	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	Single Family	Drip Irrigation Incentive for SFR	$132	$272	$417	$570	$729	$747	$766	$785	$803	$822	$843	$864	$708	$544	$371	$190	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Incentivize Irrigation Equipment Upgrades - S	$420	$861	$1,322	$1,805	$2,309	$2,368	$2,427	$2,486	$2,546	$2,605	$2,137	$1,643	$1,122	$574	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

13	Single Family	High Efficiency Faucet Aerator / Showerhead	$2,014	$4,130	$6,345	$8,662	$11,079	$9,090	$6,988	$4,772	$2,443	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Commercial	Restaurant Spray Nozzle Rebates	$4,032	$8,265	$12,699	$17,335	$22,173	$18,193	$13,986	$9,551	$4,889	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$52,437**	**$101,887**	**$148,999**	**$194,312**	**$238,272**	**$203,618**	**$172,742**	**$144,902**	**$119,481**	**$95,972**	**$89,350**	**$82,415**	**$74,720**	**$66,694**	**$58,337**	**$52,291**	**$46,130**	**$40,362**	**$34,508**	**$28,567**	**$28,127**	**$27,676**	**$27,217**	**$26,750**	**$26,277**

Appendix C

Methodology for Water Conservation Program Savings Analyses

Appendix C
Methodology for Water Conservation Program Savings Analyses

This Appendix describes the methodology used to estimate water conservation program savings based on customer billing data, for the analyses presented in report Section 5.3.2, *Estimated Water Savings for Five Selected Programs Based on Customer Billing Data*.

Water use savings associated with conservation programs are typically estimated based on literature values, which may or may not accurately capture the specific ways customers in a specific area (i.e., North Marin Water District [District]) use water. Therefore, District customer billing data were analyzed in order to assess the amount of water typically saved through implementation of each of the five selected conservation programs. Water use by program participants was compared to water use by a representative cohort over the same time period, that was stratified based on key criteria. Water use savings were estimated for the five conservation programs identified below:

1. Cash for Grass Rebate Program
2. High efficiency clothes washer (HECW) Rebate Program
3. High efficiency toilet (HET) Rebate Program
4. Water Smart Survey Program
5. Weather Based Irrigation Controller (WBIC) Rebate Program

Specifically, water use before and after implementation of a given action (e.g., device replacement or turf removal) by program participants is compared to the water use by a cohort of accounts who have not participated in the same or other programs in the given time frame. The incremental volume of water saved by program participants compared to that of the cohort group can then be attributed to program participation, as other factors have been normalized. This analytical technique is a version of the "Difference-in-Differences Estimation" method. The Difference-in-Differences Estimation method is a standard method used in economics and social science for quantitatively evaluating observational study data by studying the differential effect of a treatment, or in this case participation in a given program as compared to a "control group," when a true controlled experiment cannot be performed (Columbia Public Health, 2013).

By comparing water use over time by program participants to a cohort group and identifying the incremental change in water use due to program participation, this methodology controls for variations in water use due to climatic, economic, and other temporally related factors. By stratifying (or weighting) the cohort group based on key factors (i.e., Census Block Group or neighborhood), this method also effectively controls for geographic-linked water use influencing factors, such as house and yard size, housing age, general socio-economic factors, general landscape management factors, etc.

Participant Sample Groups: In order to estimate the water saving attributable to a single conservation program, participant sample groups for this analysis were limited to accounts that participated in only one program, and who participated in that program in only one year (e.g., did not receive several HET rebates over several years), except as indicated in savings results tables, as appropriate. The participant sample groups were further limited to just those accounts that had active water use over the study period. Active accounts were identified as those who received six water bills and had non-zero water use in a given year.

Comparison Cohort Sample Groups: Accounts included in the cohort groups are limited to those accounts that had not participated in any program based on available data and that meet the same active account thresholds as described above for the participant sample groups (i.e., received six bills per year and non-zero annual water use). It is possible that members of the cohort group participated in a program that was not included in this study; however, given the large number of accounts included in these cohort groups the effect of participation in other programs would be expected to be minimal. Although not participants in a specific program, a portion of the cohort group members would be expected to have changed out water using devices with more efficient ones through natural replacement. Given this, the program savings identified by this method may actually be somewhat higher than estimated herein, resulting in a more conservative program savings estimate.

Study Periods: Since account-level water use billing data are available from 2004 to 2019, the participation data from 2010 to 2017 are analyzed so that two to three years of water use data can be used to capture the average water use before and after the participation year.

Stratification: The water savings calculations for all accounts were stratified (or weighted) based on the Census Block Group (except as indicated in savings results table notes, as appropriate), as a way to control for geographically linked variables such as house and yard size, housing age, general socio-economic factors, etc.

Water Savings Calculation: For each active account, the average annual water use for a period of three years prior to program participation is compared to the average annual water use in the two to three years following program participation, dependent on available data. The change in water use by program participants is then compared to that of the cohort group over the same time period. The difference between the change in water use of the participants and the change in water use of the cohorts is the water savings due to the given conservation program. A positive average water savings suggests the program resulted in water savings, while a negative average water savings suggests the program was not successful in saving water.

References

Columbia Public Health, 2013. Difference in Difference Estimation. Columbia Public Health, https://www.publichealth.columbia.edu/research/population-health-methods/difference-difference-estimation#Overview, accessed 28 September 2020.

Appendix D

Prioritization and Screening of Future Water Conservation Measures

Prioritization and Screening of Future Water Conservation Measures
Marin-Sonoma Saving Water Partnership

INSTRUCTIONS: Please review and complete the orange highlighted cells using the provided dropdown lists. Comments and clarifications may be added to the comments column on the right. You may use the filter features to help navigate this list. "Preference for Implementation" need only be completed when a program is given a priorty of 3 or greater. See READ ME tab for additional information.

Conservation Measure/Program	Type	Indoor / Outdoor	Primary End Use	Sector	Priority as a Regional Program	Priority as a Local Program	Preference for Implementation	Current Implementation Status	Notes / Comments	Source	Added By
Agency Actions and Water Rates											
Customer Water Loss Reduction (AMI Leak Detection)	Agency action	Both	Water Loss	All						2015 Screening	EKI
Increase Enforcement of Customer Pressure Reducing Valve (PRV) Requirement	Agency action	Both	Water loss; Irrigation	All						Added 2020	EKI
Increase Enforcement of Indoor Fixture Retrofit at Time of Sale	Agency action	Indoor	Toilet, Urinal, Faucet, Showerhead	All					Enforcement of SB 407 at time of sale.	2015 Screening	EKI
Increase Enforcement of State Water Waste Regulations	Agency action	Outdoor	Irrigation	All					Assumes water waste regulations per Executive Order B-40-17 rulemaking is completed largely as currently proposed.	Added 2020	EKI
Install AMI for Existing Accounts	Agency action	Both	Water Loss	All						2015 Screening	EKI
Install AMI for High Water Users and Large Landscape Accounts	Agency action	Outdoor	Water Loss	All						2015 Screening	EKI
Install AMI in New Development	Agency action	Both	Water Loss	All						2015 Screening	EKI
Rate Structure Evaluation	Agency action	Both	All	All						2015 Screening	EKI
Regional UHET and/or Urinal Bulk Purchase Program	Agency action	Indoor	Toilet / Urinal	All					Fixtures are purchased in bulk at a discounted rate and then sold to customers at the discounted rate	2015 Screening	EKI
Water Budgeting/Monitoring for Large Landscape Accounts	Agency action	Both	Irrigation	IRR						2015 Screening	EKI
Establish Separate Pricing Structure for Irrigation Accounts	Water Rates	Outdoor	Irrigation	IRR						2015 Screening	EKI
Modification to or Implementation of Tiered Rate Conservation Pricing	Water Rates	Both	All	All						2015 Screening	EKI
Tiered Water Rates (Conservation Pricing)	Water Rates	Both	All	All						2015 Screening	EKI
Water Budget Based Billing for All Customers	Water Rates	Both	All	All						2015 Screening	EKI
Water Budget Based Billing for Only Irrigation Customers	Water Rates	Outdoor	Irrigation	CII, IRR						2015 Screening	EKI
Public Outreach and Education											
Water Use Surveys/Audits - CII	Audit/ Survey	Both	All	CII						2015 Screening	EKI
Water Use Surveys/Audits - MFR	Audit/ Survey	Indoor	All Indoor	MFR						2015 Screening	EKI
Water Use Surveys/Audits - SFR	Audit/ Survey	Both	All	SFR						2015 Screening	EKI
Educational Workshops	Public Outreach/ Workshop	Outdoor	All Outdoor	SFR						Added 2020	MMWD
Garden tour	Public Outreach/ Workshop	Outdoor	Outdoor	SFR						Added 2020	MMWD
Promote Green Building and Certification	Public Outreach/ Workshop	Both	All	All						2015 Screening	EKI
Provide Support with Smart Irrigation Controller Setup	Public Outreach/ Workshop	Outdoor	Irrigation	All						Added 2020	EKI
Public Outreach through Print & Electronic Media - Focused on Indoor Conservation	Public Outreach/ Workshop	Outdoor	All Indoor	All						2015 Screening	EKI
Public Outreach through Print & Electronic Media - Focused on Outdoor Irrigation	Public Outreach/ Workshop	Indoor	Irrigation	All						2015 Screening	EKI
QWEL Training (Qualified Water Efficient Landscaper)	Public Outreach/ Workshop	Outdoor	Irrigation	All						Added 2020	EKI
School Education Programs	Public Outreach/ Workshop	Both	All	SFR, MFR						2015 Screening	EKI
Device-Based and Financial Incentive Programs											
Direct Install of Efficient Indoor Fixtures - Commercial and Industrial	Direct Install/ No-Cost Device	Indoor	Toilet, Urinal, Faucet, Showerhead	CII						2015 Screening	EKI
Direct Install of Efficient Indoor Fixtures - Government Buildings	Direct Install/ No-Cost Device	Indoor	Toilet, Urinal, Faucet, Showerhead	CII						2015 Screening	EKI
Direct Install of Efficient Indoor Fixtures - Low Income Residential	Direct Install/ No-Cost Device	Indoor	Toilet, Faucet, Showerhead	SFR, MFR						2015 Screening	EKI
Direct Install of Efficient Indoor Fixtures - Residential	Direct Install/ No-Cost Device	Indoor	Toilet, Faucet, Showerhead	SFR, MFR						2015 Screening	EKI
High Efficiency Clothes Washer Install - Low Income Residential Customers	Direct Install/ No-Cost Device	Indoor	Clothes Washer	SFR, MFR						Added 2020	EKI
High Efficiency Faucet Aerator / Showerhead Giveaway - CII Customers	Direct Install/ No-Cost Device	Indoor	Faucet, Showerhead	CII						2015 Screening	EKI
High Efficiency Faucet Aerator / Showerhead Giveaway - Residential Customers	Direct Install/ No-Cost Device	Indoor	Faucet, Showerhead	SFR, MFR						2015 Screening	EKI
Rain Barrel Giveaway	Direct Install/ No-Cost Device	Outdoor	Irrigation	SFR						Added 2020	EKI
Rain Sensor Giveaway	Direct Install/ No-Cost Device	Outdoor	Irrigation	All						2015 Screening	EKI
Rotating Sprinkler Nozzle Giveaway	Direct Install/ No-Cost Device	Outdoor	Irrigation	All						Added 2020	EKI
Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - Large Landscape	Direct Install/ No-Cost Device	Outdoor	Irrigation	MFR, CII						2015 Screening	EKI
Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - SFR	Direct Install/ No-Cost Device	Outdoor	Irrigation	SFR						Added 2020	EKI
Soil Moisture Sensor Giveaway	Direct Install/ No-Cost Device	Outdoor	Irrigation	All						Added 2020	EKI
Toilet Flapper Giveaway - SFR customers	Direct Install/ No-Cost Device	Indoor	Toilet	SFR, MFR					Could be used for CII customers, but hasn't been yet.	Added 2020	Santa Rosa
UHET Direct Installation - CII	Direct Install/ No-Cost Device	Indoor	Toilet	CII						2015 Screening	EKI
UHET Direct Installation - Residential	Direct Install/ No-Cost Device	Indoor	Toilet	SFR, MFR						2015 Screening	EKI
Urinal Direct Installation - CII	Direct Install/ No-Cost Device	Indoor	Urinal	CII						Added 2020	EKI
Autoclave (Steam-Sterilizer) Retrofit Rebates	Rebate/ Financial Incentive	Indoor	CII Equipment	CII					More info: https://www.energy.gov/eere/femp/water-efficient-technology-opportunity-steam-sterilizer-condensate-retrofit-kit	Added 2020	EKI
Connectionless Food Steamer Rebates	Rebate/ Financial Incentive	Indoor	CII Equipment	CII					More info: https://www.energy.gov/eere/femp/water-efficient-technology-opportunity-connectionless-food-steamer	Added 2020	EKI
Dipper Well Rebates	Rebate/ Financial Incentive	Indoor	CII Equipment	CII					Incentivize replacement of perpetual-flow holders for ice cream dippers & utensils; https://server-products.com/equipment/conservewell/utensil-holder/87740.htm	Added 2020	EKI
Drip Irrigation Incentive for MFR and CII	Rebate/ Financial Incentive	Outdoor	Irrigation	MFR, CII						2015 Screening	EKI
Drip Irrigation Incentive for SFR	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						2015 Screening	EKI
Dry Vacuum Pumps	Rebate/ Financial Incentive	Indoor	CII Equipment	CII						2015 Screening	EKI
Efficient (EnergyStar) Dishwasher Rebates	Rebate/ Financial Incentive	Indoor	Dishwashers	SFR						2015 Screening	EKI
High Efficiency Clothes Washer Rebate - Residential	Rebate/ Financial Incentive	Indoor	Clothes Washer	SFR, MFR						2015 Screening	EKI
High Efficiency Clothes Washer Rebate Program - CII	Rebate/ Financial Incentive	Indoor	Clothes Washer	CII						2015 Screening	EKI
High Efficiency Urinal (<0.25 gal/flush) Rebates - CII	Rebate/ Financial Incentive	Indoor	Urinal	CII						2015 Screening	EKI

Prioritization and Screening of Future Water Conservation Measures
Marin-Sonoma Saving Water Partnership

INSTRUCTIONS: Please review and complete the orange highlighted cells using the provided dropdown lists. Comments and clarifications may be added to the comments column on the right. You may use the filter features to help navigate this list. "Preference for Implementation" need only be completed when a program is given a priorty of 3 or greater. See READ ME tab for additional information.

Conservation Measure/Program	Type	Indoor / Outdoor	Primary End Use	Sector	Priority as a Regional Program	Priority as a Local Program	Preference for Implementation	Current Implementation Status	Notes / Comments	Source	Added By
Hot Water on Demand Pump System Rebate	Rebate/ Financial Incentive	Indoor	Hot Water	SFR, MFR						2015 Screening	EKI
Incentivize Artificial Turf for Sports Fields	Rebate/ Financial Incentive	Outdoor	Irrigation	CII						2015 Screening	EKI
Incentivize Cooling Tower Upgrades	Rebate/ Financial Incentive	Indoor	Cooling Towers	CII						Added 2020	EKI
Incentivize Gray Water Retrofit for Existing SFR Customers	Rebate/ Financial Incentive	Outdoor	Irrigation / Gray Water	SFR						2015 Screening	EKI
Incentivize Gray Water Systems for New CII Development	Rebate/ Financial Incentive	Both	Irrigation / Gray Water	CII						2015 Screening	EKI
Incentivize Irrigation Equipment Upgrades - Large Landscapes	Rebate/ Financial Incentive	Outdoor	Irrigation	MFR, CII, IRR						2015 Screening	EKI
Incentivize Irrigation Equipment Upgrades - SFR	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						2015 Screening	EKI
Incentivize Replacement of Inefficient Commercial and Industrial Equipment	Rebate/ Financial Incentive	Indoor	CII Equipment	CII					Example: SoCal Water Smart Water Savings Incentive Program: https://socalwatersmart.com/en/commercial/water-savings-incentive-program/	2015 Screening	EKI
Incentivize Replacement of Pressure Reducing Valves (PRVs) with 60-70 psi PRVs	Rebate/ Financial Incentive	Both	Water loss; Irrigation	All					PRVs must be installed by customers with pressure exceeding 80 psi, per the plumbing code	2015 Screening	EKI
Incentivize Submetering for Existing Customers - CII	Rebate/ Financial Incentive	Both	All Indoor	MFR, COM, IRR						2015 Screening	EKI
Incentivize Submetering for Existing Customers - MFR	Rebate/ Financial Incentive	Both	All Indoor	MFR						2015 Screening	EKI
Incentivize Submetering of Cooling Towers for Existing Customers	Rebate/ Financial Incentive	Indoor	Cooling Towers	CII						2015 Screening	EKI
Indoor Fixture Program For Hotels & Motels	Rebate/ Financial Incentive	Indoor	All Indoor	CII						2015 Screening	EKI
Indoor Fixture Program For Schools	Rebate/ Financial Incentive	Indoor	All Indoor	CII						2015 Screening	EKI
Landscape Conversion or Turf Removal - MFR and CII	Rebate/ Financial Incentive	Outdoor	Irrigation	MFR, CII						2015 Screening	EKI
Landscape Conversion or Turf Removal -SFR	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						2015 Screening	EKI
Mulch rebate	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						Added 2020	MMWD
Nonresidential Incentive for Self-closing or Metering Faucets	Rebate/ Financial Incentive	Indoor	Faucet	CII						Added 2020	Sonoma
Plumber Initiated UHET and / or Urinal Retrofit Program	Rebate/ Financial Incentive	Indoor	Toilet	All						2015 Screening	EKI
Rain Barrel Rebate	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						2015 Screening	EKI
Rain Sensor Rebate	Rebate/ Financial Incentive	Outdoor	Irrigation	All						2015 Screening	EKI
Rainwater Catchment System Rebate for Large Landscapes	Rebate/ Financial Incentive	Outdoor	Irrigation	MFR, CII						2015 Screening	EKI
Rebates for Conductivity Controllers on Cooling Towers	Rebate/ Financial Incentive	Indoor	Cooling Towers	CII						2015 Screening	EKI
Restaurant Spray Nozzle Rebates	Rebate/ Financial Incentive	Indoor	CII Equipment	CII						2015 Screening	EKI
Rotating Sprinkler Nozzle Rebate	Rebate/ Financial Incentive	Outdoor	Irrigation	All						2015 Screening	EKI
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - Large Landscape	Rebate/ Financial Incentive	Outdoor	Irrigation	MFR, CII						2015 Screening	EKI
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - SFR	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						2015 Screening	EKI
Soil Moisture Sensor Rebate	Rebate/ Financial Incentive	Outdoor	Irrigation	All						2015 Screening	EKI
Swimming Pool and Hot Tub Cover Rebates	Rebate/ Financial Incentive	Outdoor	Pool/Hot Tub	SFR, MFR						Added 2020	EKI
Thermostatic Shut-Off Valve Showerheads/Tub Spouts Rebates	Rebate/ Financial Incentive	Indoor	Shower	SFR, MFR, CII					Reduce hot water use before showering https://www.thinkevolve.com/	Added 2020	EKI
Tier 4 Exemption	Rebate/ Financial Incentive	Both	toilet, Faucet, Showerhead, clothes washer, irrigation	SFR					Exemption from high tier water rates w/installation of devices	Added 2020	MMWD
UHET <1.0 gal/flush Rebate - CII	Rebate/ Financial Incentive	Indoor	Toilet	CII						2015 Screening	EKI
UHET <1.0 gal/flush Rebate - Residential	Rebate/ Financial Incentive	Indoor	Toilet	SFR, MFR						2015 Screening	EKI
Water Savings Incentive Program for CII	Rebate/ Financial Incentive	Indoor	All Indoor	CII					Financial incentive to reward demonstrated water savings and offset capital improvement costs; Example: SoCal Water Smart Water Savings Incentive Program: https://socalwatersmart.com/en/commercial/water-savings-incentive-program/	2015 Screening	EKI
Policies and Regulations											
Demand Offset/Water Neutral Policy for Large New Developments	Policy/ Regulation	Both	All	All						Added 2020	EKI
Prohibit Once through Cooling Systems	Policy/ Regulation	Both	CII Equipment	CII						2015 Screening	EKI
Require <0.25 gal/flush Urinals in New Development	Policy/ Regulation	Indoor	Urinal	CII						2015 Screening	EKI
Require <1.0 gal/flush Toilets in New Development	Policy/ Regulation	Indoor	Toilet	All					State minimum efficiency is 1.28 gal/flush	Added 2020	EKI
Require Cooling Tower Retrofits	Policy/ Regulation	Indoor	Cooling Towers	CII						2015 Screening	EKI
Require Efficient (EnergyStar) Dishwashers in New Development	Policy/ Regulation	Indoor	Dishwashers	SFR, MFR						2015 Screening	EKI
Require High Efficiency Clothes Washers in New Development	Policy/ Regulation	Indoor	Clothes Washer	SFR, MFR						2015 Screening	EKI
Require Hot Water on Demand / Structured Plumbing in New Residential Development	Policy/ Regulation	Indoor	Shower/Sink	SFR, MFR						2015 Screening	EKI
Require Irrigation Designers / Installers be Certified (QWEL)	Policy/ Regulation	Outdoor	Irrigation	All						2015 Screening	EKI
Require On-Site Water Reuse Systems (Grey Water or Black Water) for Large CII Developments	Policy/ Regulation	Outdoor	Irrigation / Recycled Water	CII					Example: https://sfwater.org/index.aspx?page=686	Added 2020	EKI
Require Plumbing for Gray Water in New SFR Development	Policy/ Regulation	Outdoor	Irrigation / Gray Water	SFR						2015 Screening	EKI
Require Plumbing for Recycled Water in New CII Development	Policy/ Regulation	Outdoor	Irrigation / Recycled Water	CII						Added 2020	EKI
Require Plumbing for Recycled Water in New MFR Development	Policy/ Regulation	Outdoor	Irrigation / Recycled Water	MFR						Added 2020	EKI
Require Rain Barrels in New Development	Policy/ Regulation	Outdoor	Irrigation	SFR						2015 Screening	EKI
Require Submetering by Unit for Existing Commercial Customers	Policy/ Regulation	Indoor	All Indoor	CII						Added 2020	EKI
Require Submetering by Unit for New Commercial Developments	Policy/ Regulation	Indoor	All Indoor	CII						Added 2020	EKI
Require Submetering for New MFR Developments	Policy/ Regulation	Indoor	All Indoor	MFR						2015 Screening	EKI
Require Submetering for New Mobile Home Park Developments	Policy/ Regulation	Indoor	All Indoor	MFR						2015 Screening	EKI
Require Submetering of Cooling Towers for Existing Customers	Policy/ Regulation	Indoor	Cooling Towers	CII						Added 2020	EKI
Require Submetering of Cooling Towers for New Development	Policy/ Regulation	Indoor	Cooling Towers	CII						Added 2020	EKI
Require Submetering of Existing MFR (and Mobile Home Park) Customers	Policy/ Regulation	Indoor	All Indoor	MFR						Added 2020	EKI
Require Submetering of Landscaping for Existing MFR and Commercial Customers	Policy/ Regulation	Outdoor	Irrigation	MFR, CII						Added 2020	EKI
Require Submetering of Landscaping for New MFR and Commercial Developments	Policy/ Regulation	Outdoor	Irrigation	CII						Added 2020	EKI
Require Swimming Pool and Hot Tub Covers	Policy/ Regulation	Outdoor	Pool/Hot Tub	SFR, MFR						2015 Screening	EKI

Prioritization and Screening of Future Water Conservation Measures
Marin-Sonoma Saving Water Partnership

INSTRUCTIONS: Please review and complete the orange highlighted cells using the provided dropdown lists. Comments and clarifications may be added to the comments column on the right. You may use the filter features to help navigate this list. "Preference for Implementation" need only be completed when a program is given a priorty of 3 or greater. See READ ME tab for additional information.

Conservation Measure/Program	Type	Indoor / Outdoor	Primary End Use	Sector	Priority as a Regional Program	Priority as a Local Program	Preference for Implementation	Current Implementation Status	Notes / Comments	Source	Added By
Require Water Efficiency Plan Reviews for New CII Development	Policy/ Regulation	Both	All Indoor	CII						2015 Screening	EKI
Require Weather Adjusting Smart Irrigation Controllers, Rain Sensors, and/or Soil Moisture Sensors in New Development	Policy/ Regulation	Outdoor	Irrigation	All						2015 Screening	EKI
Restrict Landscape Irrigation to Designated Days/Times	Policy/ Regulation	Outdoor	Irrigation	All					Under all conditions, not just drought	2015 Screening	EKI
Water Conserving Landscape and Irrigation Codes, More Stringent than MWELO	Policy/ Regulation	Outdoor	Irrigation	All						2015 Screening	EKI
Water Waste Ordinance	Policy/ Regulation	Outdoor	All Outdoor	All						Added 2020	MMWD

Abbreviations:
AMI = advanced metering infrastructure
CII = commercial, industrial, institutional
COM = commercial
HET = high efficiency toilet
HEU = high efficiency urinal
Info = information
IRR = irrigation account
MFR = multi-family residential
MWELO = Model Water Efficient Landscape Ordinance
PRV = pressure reducing valve
SFR = single-family residential
SMSWP = Sonoma-Marin Saving Water Partnership
UHET = ultra high efficiency toilet

NORTH MARIN WATER DISTRICT

Appendix C

UWMP Agency Notification Letters

NORTH MARIN
WATER DISTRICT

999 Rush Creek Place
P.O. Box 146
Novato, CA 94948-0146

PHONE
415-897-4133

EMAIL
info@nmwd.com

WEB
www.nmwd.com

November 19, 2020

To: Interested Parties:

Re: **Notice of Preparation of Urban Water Management Plan - 2020 Update**

The Urban Water Management Planning Act (California Water Code, §10610-10656 and §10608) requires North Marin Water District (NMWD) to update its Urban Water Management Plan (UWMP) every five years. NMWD is currently reviewing its existing 2015 UWMP, which was updated in 2016, and considering revisions to the document. The 2020 UWMP is due by July 1, 2021. We invite your agency's participation in this revision process.

A draft of the 2020 UWMP will be made available for public review and a public hearing will be scheduled for spring of next year. In the meantime, if you would like more information regarding the District's 2015 UWMP and the schedule for preparing the 2020 UWMP, or if you would like to participate in the 2020 UWMP preparation, please contact Ryan Grisso at:

North Marin Water District
P.O. Box 146
Novato, CA 94948-0146
Phone: (415) 761-8933
rgrisso@nmwd.org

Sincerely,

Drew McIntyre
General Manager

Distribution List:

Sonoma County Water Agency, Attention: Grant Davis
Novato Sanitary District, Attention: Sandeep Karkal
Las Gallinas Valley Sanitary District, Attention: Mike Prinz
Marin County LAFCO, Attention: Jason Fried
Marin Municipal Water District, Attention: Ben Horenstein
County of Marin, Attention: Tom Lai
City of Novato, Attention: Steve Marshall
City of Sonoma, Attention: Colleen Ferguson
City of Santa Rosa, Attention: Jennifer Burke
City of Rohnert Park, Attention: Mary Grace Pawson
City of Cotati, Attention: Craig Scott
City of Petaluma, Attention: Jason Beatty
Town of Windsor, Attention: Sandi Potter
Valley of the Moon Water District, Attention: Matt Fullner
County of Sonoma PRMD, Attention: J.T. Wick

NORTH MARIN
WATER DISTRICT

999 Rush Creek Place
P.O. Box 146
Novato, CA 94948-0146

PHONE
415-897-4133

EMAIL
info@nmwd.com

WEB
www.nmwd.com

December 18, 2020

To: Interested Parties

Re: **Notice of Preparation of Water Shortage Contingency Plan - 2020 Update**

The Urban Water Management Planning Act (California Water Code §10608–10656) requires the North Marin Water District ("NMWD") to update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan ("WSCP") every 5 years. We have previously sent you notification of the ongoing revision of the UWMP. NMWD is also currently reviewing its existing WSCP, which was updated in 2016, and is considering revisions to that document. The updated WSCP is due by July 1, 2021. We invite your agency's participation in this revision process.

A draft of the 2020 WSCP will be made available for public review and a public hearing will be scheduled for spring of next year. In the meantime, if you would like more information regarding the District's 2015 WSCP and the schedule for preparing the 2020 WSCP, or if you would like to participate in the preparation of the 2020 WSCP, please contact Ryan Grisso at:

North Marin Water District
P.O. Box 146
Novato, CA 94948-0146
Phone: (415) 761-8933
rgrisso@nmwd.org

Sincerely,

Drew McIntyre
General Manager

Distribution List:

Sonoma County Water Agency, Attention: Grant Davis
Novato Sanitary District, Attention: Sandeep Karkal
Las Gallinas Valley Sanitary District, Attention: Mike Prinz
Marin County LAFCO, Attention: Jason Fried
Marin Municipal Water District, Attention: Ben Horenstein
County of Marin, Attention: Tom Lai
City of Novato, Attention: Steve Marshall
City of Sonoma, Attention: Colleen Ferguson
City of Santa Rosa, Attention: Jennifer Burke
City of Rohnert Park, Attention: Mary Grace Pawson
City of Cotati, Attention: Craig Scott
City of Petaluma, Attention: Jason Beatty
Town of Windsor, Attention: Sandi Potter
Valley of the Moon Water District, Attention: Matt Fullner
County of Sonoma PRMD, Attention: J.T. Wick

R:\Folders by Job No\4000 jobs\4050.01 2020 UWMP\NMWD_WSCP_Letter_Agency_Notice.docx

NORTH MARIN
WATER DISTRICT

999 Rush Creek Place
P.O. Box 146
Novato, CA 94948-0146

PHONE
415-897-4133

EMAIL
info@nmwd.com

WEB
www.nmwd.com

May 25, 2021

To: Interested Parties

Re: **Notice of Public Hearing Urban Water Management Plan and Water Shortage Contingency Plan - 2020 Update**

The Urban Water Management Planning Act (California Water Code §10608–10656) requires the North Marin Water District (District) to update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years. The District must also make the draft documents available for public review and hold a public hearing before adopting its UWMP and associated WSCP.

This is to notify you that the District will hold a public hearing on June 15, 2021 at 6:00 p.m. by virtual meeting to consider proposed revisions and updates to the 2020 UWMP and associated WSCP. We invite your agency's participation in the process. In conjunction with the update to the UWMP, the public may also provide input on the urban water use target included in the UWMP, any impacts to the local economy, and the District's method of determining its urban water use target.

The UWMP and associated WSCP will be made available for public review by June 1, 2021 at https://nmwd.com/. Visit https://nmwd.com/about/documents/ for the District Board meeting agenda and for links to the virtual public hearing.

If you have any questions about the 2020 UWMP or WSCP or the process for updating these documents, please contact Ryan Grisso at:

North Marin Water District
P.O. Box 146
Novato, CA 94948-0146
Phone: (415) 761-8933
rgrisso@nmwd.com

Sincerely,

Drew McIntyre
General Manager

Distribution List:

Sonoma County Water Agency, Attention: Grant Davis
Las Gallinas Valley Sanitary District, Attention: Mike Prinz
Marin Municipal Water District, Attention: Ben Horenstein
City of Santa Rosa, Attention: Jennifer Burke
City of Rohnert Park, Attention: Mary Grace Pawson
City of Cotati, Attention: Craig Scott
Town of Windsor, Attention: Sandi Potter
County of Sonoma PRMD, Attention: J.T. Wick
Novato Sanitary District, Attention: Sandeep Karkal
Marin County LAFCO, Attention: Jason Fried
County of Marin, Attention: Tom Lai
City of Sonoma, Attention: Colleen Ferguson
Valley of the Moon Water District, Attention: Matt Fullner
City of Petaluma, Attention: Jason Beatty
City of Novato, Attention: Steve Marshall

NORTH MARIN WATER DISTRICT

Appendix D

UWMP Public Hearing Notices

all new Classifieds

Buy and view ads in print and 24/7 online!

415-382-7242 | marinij.com

"Just go online to marinij.com and place an ad. Your ad will be in print AND online!"

sell your stuff now

Jobs

monster

JOBS - print & online.

Career training services, employment services, job opportunities.

Homes

REAL ESTATE - For Sale – For Rent

Homes and property for sale and for rent.

Autos

AUTOMOTIVE - Ads in today's Classifieds in print and online.

Autos, aircraft, motorcycles, parts, auto financing, services, trailers.

Stuff

MERCHANDISE - Stuff you need or need to sell in today's Classifieds.

General merchandise, electronic, garage sales, sporting goods.

Pets

15 lines/30 days.....$35

Garage Sale

5 lines/2 days (Includes Directory).....$19.00

5 lines/3 days (Includes Directory).....$25.00

Autos Sell It Fast GUARANTEED!*

4 lines/30 days.....$29

One vehicle per ad. *If your vehicle doesn't sell after 30 days, lower the price by at least 5% and receive an additional 30 days free!

Publication Day Deadline

Monday	Friday 4:00 p.m.
Tuesday	Monday 4:00 p.m.
Wednesday	Tuesday 4:00 p.m.
Thursday	Wednesday 4:00 p.m.
Friday	Thursday 4:00 p.m.
Saturday	Friday 4:00 p.m.
Sunday	Friday 4:00 p.m.
Open Home listings	Friday 12 noon

Garage Sale Directory

Friday.....Thursday, 2:45 p.m.

Saturday & Sunday.....Friday, 2:45 p.m.

Hours: Monday thru Friday 8:30 a.m. - 4:00 p.m.

Classified Rates: Private party classified rates are based on the number of lines in your ad, the days of the week your ad runs, and the number of days your ad runs. There is a three line minimum with approx. 18 characters per line. Call for pricing. Limited abbreviations available. Maximum 5 ads per month. We reserve the right to edit or reject and properly classify all ads.

Easy ways to pay: Use your Discover, Mastercard, American Express or Visa. Mail in your check TTo our office, or come in person, pay by credit card, check, or cash 8:30 a.m. to 4:00 p.m., Monday-Friday.

All special offers private party only. Prepayment required. Merchandise ads: $5,000 maximum.

Go online to marinij.com to place an ad today!

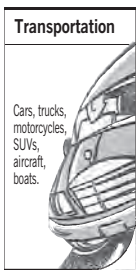
Rentals

Apartments, homes, shared housing.

Workspace Rentals

Office Available in attractive office suite in great downtown San Rafael location to share with another professional. Negotiable options available. Call Jay: (415) 789-3700 x 101.

Transportation



Cars, trucks, motorcycles, SUVs, aircraft, boats.

Automotive Wanted

Classic Cars Wanted: Porsche, Mercedes, Ford, Chevy, etc. Running or not. 1-800-432-7204

Fictitious Business Name Statements

Advertise Your DBA Statement with the IJ! Mail your filed copy to **Marin IJ Legal Department 4000 Civic Center Drive, Suite 301, San Rafael, CA 94903** or call (415) 382-7335 for more information.

*Prepayment is required.

Legal Notice

CERTIFICATE OF ABANDONMENT OF FICTITIOUS BUSINESS NAME
COUNTY OF MARIN
Abandonment File No. 304947
Date of Abandonment- May 31, 2021
The undersigned hereby certifies that the below listed person(s) or other entity heretofore conducting business under the following fictitious business name, certificate of which was filed on the date indicated in the stated county under the listed number, has abandoned the use of said fictitious business name: **BEST HAIR**
Most Recent FBN No.:2018145202
Date Filed: 8/20/18
County in Which Filed: Marin
FICTITIOUS BUSINESS NAME:
Best Hair
475 Entrada Drive
Novato, CA 94949
NAME OF REGISTRANT:
Yenngoc T. Nguyen
1627 Dewey Street
Vallejo, CA 94590
/s/ Yenngoc T. Nguyen
FILED: June 02, 2021
SHELLY SCOTT
Marin County Clerk
By: J. Gilardi, Deputy
6/7, 14,21 & 28TH ,2021

FICTITIOUS BUSINESS NAME STATEMENT COUNTY OF MARIN File No. 151316
Business or change started on n/a
The following person(s) is (are) doing business as:
Allied Universal Technology Services
2173 Francisco Blvd, E Suite H
San Rafael, CA 94901
Securadyne Systems Intermediate LLC
161 Washington St, Ste 600
Conshohocken, PA 19428
county of principal place of business:
Marin
This business is conducted by: Limited Liability Company
/s/David Buckman
FILED: May 27, 2021
SHELLY SCOTT
MARIN COUNTY CLERK
By J.Gilardi, Deputy
NOTICE: This statement expires on 5/27/2026. A new FBN statement must be filed no more than 40 days from expiration.
This filing does not of itself authorize the use of this name in violation of the rights of another under federal, state or common law. (B&P Code 14400 et seq.)
6/7, 6/14, 6/21, 6/28/2021

FICTITIOUS BUSINESS NAME STATEMENT COUNTY OF MARIN File No. 151106
Business or change started on n/a
The following person(s) is (are) doing business as:
VinFast
1618 Redwood Highway
Corte Madera, CA 94925
VinFast Dealer San Francisco #1, LLC
790 N. San Mateo Drive
San Mateo, CA 94401
county of principal place of business:
Marin
This business is conducted by: Limited Liability Company
/s/Jeremy Snyder
FILED: April 26, 2021
SHELLY SCOTT
MARIN COUNTY CLERK
By J. Mannion, Deputy
NOTICE: This statement expires on 4/26/2026. A new FBN statement must be filed no more than 40 days from expiration.
This filing does not of itself authorize the use of this name in violation of the rights of another under federal, state or common law. (B&P Code 14400 et seq.)
6/7, 6/14, 6/21, 6/28/2021

FICTITIOUS BUSINESS NAME STATEMENT COUNTY OF MARIN File No. 151338
Business or change started on 6/1/2021
The following person(s) is (are) doing business as:
Best Hair
475 Entrada Dr
Novato, CA 94949
David Ryan
145 Colgan Ave #1117
Santa Rosa, CA 95401
county of principal place of business:
Marin
This business is conducted by: An Individual
/s/David Ryan
FILED: June 2, 2021
SHELLY SCOTT
MARIN COUNTY CLERK
By J.Gilardi, Deputy
NOTICE: This statement expires on 6/2/2026. A new FBN statement must be filed no more than 40 days from expiration.
This filing does not of itself authorize the use of this name in violation of the rights of another under federal, state or common law. (B&P Code 14400 et seq.)
6/7, 6/14, 6/21, 6/28/2021

FICTITIOUS BUSINESS NAME STATEMENT COUNTY OF MARIN File No. 151318
Business or change started on 1/1/2013
The following person(s) is (are) doing business as:
Keith Tadder Construction
1368 Lincoln Ave #213
San Rafael, CA 94901
Keith L Tadder
1368 Lincoln Ave #213
San Rafael, CA 94901
county of principal place of business:
Marin
This business is conducted by: An Individual
/s/Keith L. Tadder
FILED: May 27, 2021
SHELLY SCOTT
MARIN COUNTY CLERK
By J.Mannion, Deputy
NOTICE: This statement expires on 5/27/2026. A new FBN statement must be filed no more than 40 days from expiration.
This filing does not of itself authorize the use of this name in violation of the rights of another under federal, state or common law. (B&P Code 14400 et seq.)
5/24, 5/31, 6/7 & 6/14/2021

FICTITIOUS BUSINESS NAME STATEMENT COUNTY OF MARIN File No. 151212
Business or change started on n/a
The following person(s) is (are) doing business as:
Mallard Pointe
1-22 Mallard Road
Belvedere, CA 94920
Mallard Pointe 1951, LLC Delaware
39 Forrest Street, Suite 202
Mill Valley, CA 94941
county of principal place of business:
Marin
This business is conducted by: Limited Liability Company
/s/Bruce Dorfman
FILED: May 10, 2021
SHELLY SCOTT
MARIN COUNTY CLERK
By J. Mannion, Deputy
NOTICE: This statement expires on 5/10/2026. A new FBN statement must be filed no more than 40 days from expiration.
This filing does not of itself authorize the use of this name in violation of the rights of another under federal, state or common law. (B&P Code 14400 et seq.)
6/7, 6/14, 6/21, 6/28/2021

The Marin/Sonoma Mosquito and Vector Control District Board of Trustees will be holding a Special Board Meeting at 6 pm and continue into the Regular Board Meeting at 7 pm June 9, via teleconference.

June 7,2021

Notice of Self Storage Sale

Please take notice Central Self Storage - Corte Madera located at 31 San Clemente Dr., Corte Madera, CA 94925 intends to hold an auction to sell the goods stored by the following tenant at the storage facility. The sale will occur as an online auction via www.storagetreasures.com on 6/16/2021 at 12:00pm. Unless stated otherwise the description of the contents are household goods and furnishings. William Charleson. All property is being stored at the above self-storage facility. This sale may be withdrawn at any time without notice. Certain terms and conditions apply. See manager for details.

May 31, June 7, 2021

Legal Notice

CITY OF NOVATO
SETTING ANNUAL APPROPRIATIONS LIMIT ("GANN LIMIT")

Notice is hereby given that the City Council of the City of Novato is scheduled to set the City's Annual Appropriations limit on

Tuesday, June 22, 2021, 6:00 p.m.
via Zoom Teleconference

Participation options and instructions for the teleconference can be obtained at www.novato.org/agendas and will also be published on the agenda posted 72 hours prior to the meeting.

This appropriations limit is adjusted each year by the application of annual adjustment factors, including changes due to population growth and per capita income.

Novato residents are invited to review appropriations limit information and provide comment to the City Council via email at novatocouncil@novato.org or during the meeting. Written correspondence regarding the appropriations limit may be mailed or delivered to the Finance Director's attention at 922 Machin Avenue, Novato, CA 94945. Mailed comments must be received prior to the date of the hearing to be considered. For more information, please contact Amy Cunningham at (415) 899-8900.

In compliance with the American with Disabilities Act, if you need assistance to participate in this meeting, please contact the City Clerk at lmcdowall@novato.org at least 72 hours prior to the meeting, so that the City can make reasonable accommodations to help ensure accessibility to this meeting.

June 7,2021

REQUEST FOR PROPOSAL
DESIGN AND BUILD SERVICES FOR

THE DESIGN AND CONSTRUCTION OF SOLAR GENERATION AND BATTERY STORAGE FOR TWO LOCATIONS:
1.TOWN'S CORP YARD (81 LUCKY DRIVE) &
2.TOWN'S COMMUNITY CENTER (498 TAMALPAIS DRIVE)

MAY 2021

Submit proposal to:
Jared Barrilleaux, Senior Civil Engineer
Town of Corte Madera
300 Tamalpais Drive
Corte Madera, CA 94925

PROPOSALS DUE BY: 2:00 P.M., THURSDAY JUNE 17TH, 2021

Estimated Fee Range: $150,000 - $300,000

To comply with the CalOES grant, project must be completed (designed, constructed and implemented) by October 31, 2021.

INTRODUCTION
The primary purpose of this Request for Proposals (RFP) is to obtain a team of qualified professionals (consultants and contractors) to provide "turn-key" services to design, procure and construct a state of the art renewable energy system that integrates battery energy storage systems (battery system) with photovoltaic arrays to fully power our Town's Corporation Yard and Community Center facilities on a daily basis, including during times of multi-day power outages, based on current and future needs. See additional facility information below:

1. 81 Lucky Drive (Corporation Yard)
System shall meet current annual demand (27,878 kwh) plus additional energy to charge EV's (the Town plans to convert maintenance truck fleet to electric vehicles, which includes 8 medium duty trucks that travel around Town approximately 100 miles per week each).

2. 498 Tamalpais Drive (Community Center)
System shall meet current annual demand (33,244 kwh) plus additional 25% to account for future building structure addition.

The funding for this project comes from a Fiscal Year (FY) 2020 Community Power Resiliency Allocation to Cities Program grant from the California Governor's Office of Emergency Services (Cal OES), see Attachment 1 for Notification of Subrecipient Allocation.

FACILITY FINANCING CONTRACT

This will be a facility financing contract (FFC) for the design and construction of solar generation and battery storage for each location.

Government Code, Chapter 3.2, Sections 4217.10 to 4217.18, makes allowances for the governing body of an agency to make the determination that a facility financing contract is in the best interest of the public agency, in lieu of formal bidding procedures, which allows for design, material procurement, construction and other components of a project to be included under one contract:

Per Government Code, Chapter 3.2, Section 4217.11 "Facility financing contract" means a contract entered into by a public agency with any person whereby the person provides financing for an energy conservation facility in exchange for repayment of the financing and all costs and expenses related thereto by the public agency. A facility financing contract may provide for the person with whom the public agency contracts to provide any combination of feasibility studies for, and design and construction of, all or part of the energy conservation facility in addition to the financing and other related services, and may provide for an installment, sale, purchase, another form of purchase, or amortized lease of the energy conservation facility by the public agency.

SELECTION TIMELINE:

Distribution of RFP	May 25th, at 4:00 p.m.
RFP Submittal Deadline	June 17th, at 2:00 p.m.
Consultant Interviews	June 23rd & 24th (if needed)
Consultant Selection	June 25th
Town Council Authorization to Proceed	Anticipated July 6th

May 31,June3, 7, 10,2021

Legal Notice

NORTH MARIN WATER DISTRICT
NOTICE OF PUBLIC HEARING
Consider approval of 2020 Urban Water Management Plan and 2020 Water Shortage Contingency Plan for the Novato Service Area

Tuesday, June 15, 2021 - 6:00 p.m.
Location: North Marin Water District, 999 Rush Creek Place, Novato, CA

* Due to anticipated changes in the COVID-19 guidance and restrictions in Marin County, prior to the scheduled public hearing, additional information regarding accommodating public participation will be provided on the District's website at www.nmwd.com.

ATTENTION: This may be a virtual meeting of the Board of Directors pursuant to Executive Order N-29-20 issued by the Governor of the State of California in which case there may not be a public location for participating in this meeting, but any interested member of the public can participate telephonically by utilizing the dial-in information printed on the agenda.

North Marin Water District (NMWD) will hold a public hearing on June 15, 2021 at 6:00 pm to receive comments on and consider approval of the Novato Service Area 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), which are adopted every five years. The purpose of the UWMP and WSCP is to consolidate information regarding water supply and demand, provide public information, improve state-wide water planning, and plan for water shortages. The draft UWMP and WSCP were developed in accordance with detailed guidance and requirements of the State Department of Water Resources (DWR). The community will be given the opportunity to give input on NMWD's UWMP and WSCP, and method of determining its urban water use target and compliance level in 2020. The UWMP and WSCP may be reviewed at https://nmwd.com/. Visit https://nmwd.com/meetings/meetings-2021/ for the NMWD Board meeting agenda and for links to the virtual public hearing should the meeting be held virtually.

Oral and written testimony will be taken at the hearing. Written comments may also be submitted to the following for receipt prior to the hearing:

Address: North Marin Water District P.O. Box 146 Novato, CA 94948-0146
Phone: (415) 897-4133
info@nmwd.com

June 1, 7,2021

June 7, 2021

NOTICE OF PUBLIC HEARING BY THE BOARD OF DIRECTORS OF MARIN MUNICIPAL WATER DISTRICT TO CONSIDER THE ADOPTION OF ITS 2020 URBAN WATER MANAGEMENT PLAN AND 2020 WATER SHORTAGE CONTINGENCY PLAN

NOTICE IS HEREBY GIVEN the Board of Directors of Marin Municipal Water District (District) will hold a public hearing on June 15, 2021 at its regularly scheduled meeting commencing at or after 7:30 pm to consider the adoption of the Draft 2020 Urban Water Management Plan and Draft 2020 Water Shortage Contingency Plan, including the SB X7-7 conservation requirement.

The Urban Water Management Planning Act, Water Code Section 10610 et seq., mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, prepare an Urban Water Management Plan, the primary objective of which is the management of urban water demands and efficient use of water.

The Draft 2020 Urban Water Management Plan and Draft 2020 Water Shortage Contingency Plan can be viewed or printed from the District's website at www.marinwater.org. A copy of the document is also available for review at the District's office (220 Nellen Avenue, Corte Madera) and at local libraries in the District's service area.

You are invited to submit comments regarding any aspect of this matter in writing or verbally at the public hearing. Prior to the public hearing, you may submit written comments via email to BoardComment@MarinWater.org. Pursuant to the Governor's Executive Order N-29-20, members of the public may also attend and submit comments verbally at the public hearing online by accessing the follow web link https://zoom.us/j/94638292022 or by phone by calling 1-669-900-6833 and entering the webinar ID#: 946 3829 2022.

The agenda packet containing the staff report will be available on the District's website at www.marinwater.org after 4:30 p.m. on June 11, 2021. For further details on this matter or to request a copy of the staff report, please contact Terrie Gillen, Board Secretary, at tgillen@marinwater.org or at (415) 945-1448.

For information on the Urban Water Management Plan, please contact Crystal Yezman at (415) 945-1100 or email her at cyezman@marinwater.org.

ad# 6580678 June 7,2021

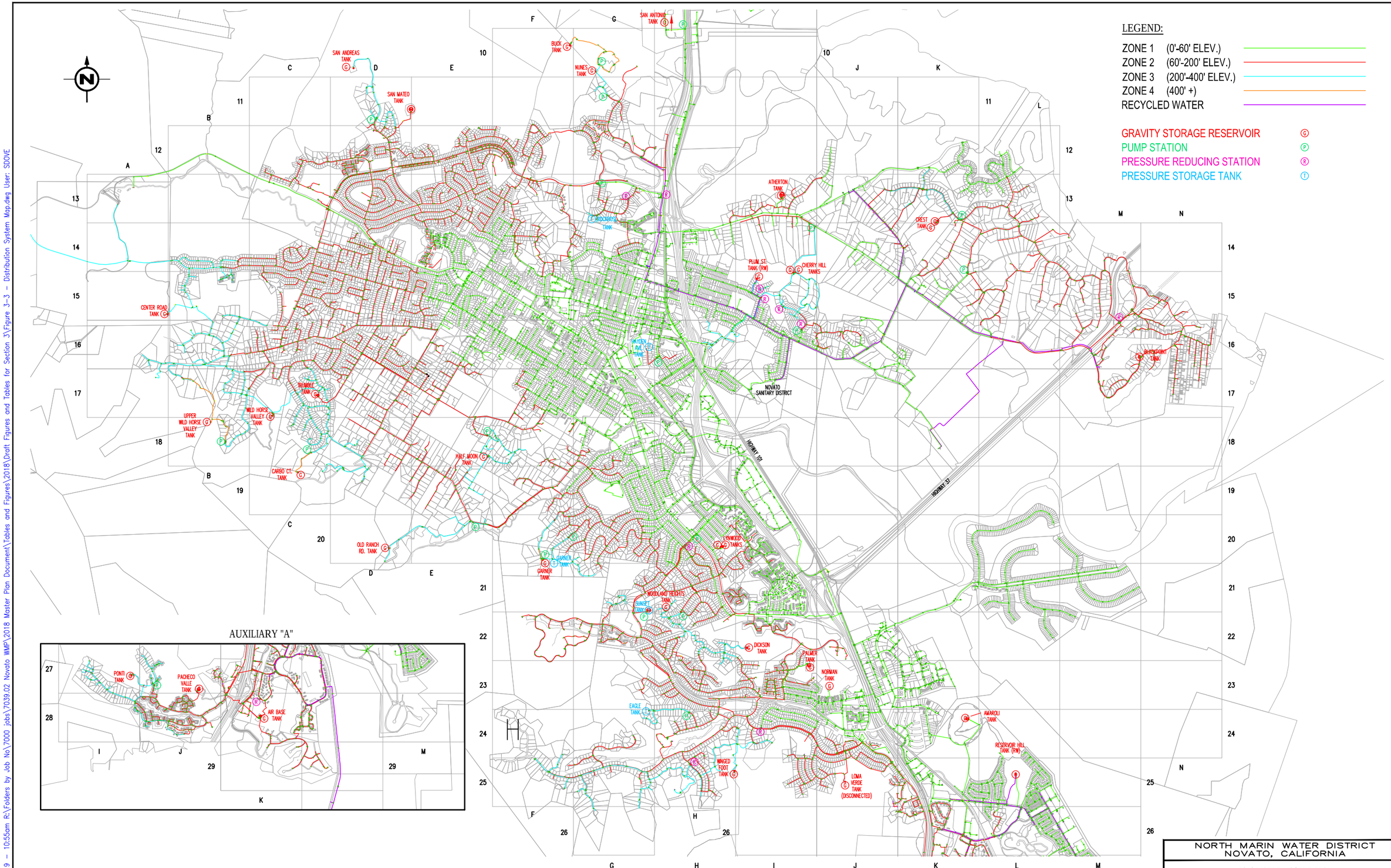
A Message To Our Readers

The Marin IJ requires all "Work From Home" job listings state the general nature of work to be performed. We make every attempt to avoid advertisements that do not comply with our requirements. Although we cannot be held responsible for either such error, we appreciate reports of any such findings to us so we can act appropriately. Be advised that some ads appearing in this column may require an applicant to purchase equipment, materials or kits.

NORTH MARIN WATER DISTRICT

Appendix E

Distribution System Map (Figure 3-3) from 2018 Novato Water System Master Plan Update



NORTH MARIN WATER DISTRICT
NOVATO, CALIFORNIA

2018 WATER MASTER PLAN
FIGURE 3-3
DISTRIBUTION SYSTEM MAP

Mar 18, 2019 - 10:55am R:\Folders by Job No\7000 jobs\7039.02 Novato WMP\2018 Master Plan Document\Tables and Figures\2018\Draft Figures and Tables for Section 3\Figure 3-3 - Distribution System Map.dwg User: SDOVE

NORTH MARIN WATER DISTRICT

Appendix F

SB X7-7 Compliance Tables

SB X7-7 Regional Alliance - 2020 GPCD (Actual)				
Participating Member Agency Name *Add rows as needed*	**2020 Actual GPCD[1]**	**2020 Population**	**(2020 GPCD) X (2020 Population)**	**Regional Alliance 2020 GPCD (Actual)**
City of Cotati	113	7,533	851,229	
Marin Municipal Water District	128	191,269	24,482,432	
North Marin Water District	119	61,658	7,337,302	
City of Petaluma	107	64,251	6,900,557	
City of Rohnert Park	96	43,069	4,126,872	
City of Santa Rosa	99	173,628	17,189,172	
City of Sonoma	166	11,725	1,946,350	
Valley of the Moon Water Distict	102	23,077	2,353,854	
Town of Windsor	119	28,397	3,379,243	
Regional Alliance Totals	1,049	604,607	68,567,011	**113**

[*] *All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable.These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

NOTES

SB X7-7 Regional Alliance - 2020 Compliance

2020 Actual GPCD	Optional Adjustment for Economic Growth[1]	Adjusted **2020 Actual GPCD**	**2020 Target GPCD** [2]	**Did Alliance Achieve Targeted Reduction for 2020?**
113	-	113	129	YES

[1] Adjustments for economic growth can be applied to either the individual supplier's data or to the aggregate regional alliance data (but not both), depending upon availability of suitable data and methods. *[2] 2020 Target GPCD will be taken from the Regional Alliance's SB X7-7 Verification Form, Weighted Target Table.*

NOTES

SB X7-7 RA1 - Weighted Baseline				
Participating Member Agency Name	**10-15 year Baseline GPCD***	**Average Population During 10-15 Year Baseline Period**	**(Baseline GPCD) X (Population)**	**Regional Alliance Weighted Average 10-15 Year Baseline GPCD**
City of Cotati	159	6,559	1,043,146	
Marin Municipal Water District	149	178,670	26,690,318	
North Marin Water District	173	54,061	9,370,435	
City of Petaluma	180	52,622	9,491,997	
City of Rohnert Park	161	40,811	6,582,847	
City of Santa Rosa	145	143,109	20,806,963	
City of Sonoma	225	9,679	2,173,212	
Valley of the Moon Water Distict	146	20,969	3,058,648	
Town of Windsor	156	24,572	3,834,809	
Regional Alliance Total	1,495	531,051	83,052,375	**156**

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable.These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

NOTES

SB X7-7 RA1 - Weighted 2020 Target				
Participating Member Agency Name	**2020 Target GPCD***	**2015 Population**	**(Target) X (Population)**	**Regional Alliance Weighted Average 2020 Target**
City of Cotati	130	7,288	947,440	
Marin Municipal Water District	124	189,000	23,436,000	
North Marin Water District	139	61,381	8,531,959	
City of Petaluma	141	61,798	8,713,518	
City of Rohnert Park	119	41,675	4,959,325	
City of Santa Rosa	126	173,071	21,806,946	
City of Sonoma	180	11,147	2,006,460	
Valley of the Moon Water Distict	124	23,478	2,911,272	
Town of Windsor	130	27,486	3,573,180	
Regional Alliance Total	1,213	596,324	76,886,100	**129**

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable.These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

NOTES

SB X7-7 2020 Compliance Form

The SB X7-7 2020 Compliance Form is for the calculation of 2020 compliance only. All retail suppliers must complete the SB X7-7 Compliance Form. Baseline and target calculations are done in the SB X 7-7 Verification Form.

The SB X7-7 Verification Form is for the calculation of baselines and targets and is a separate workbook from the SB X7-7 2020 Compliance Form. Most Suppliers will have completed the SB X7-7 Verification Form with their 2015 UWMP and do not need to complete this form again in 2020. See Chapter 5 Section 5.3 of the UWMP Guidebook for more information regarding which Suppliers must, or may, complete the SB X7-7 Verification Form for their 2020 UWMP. 2020 compliance calculations are done in the SB X7-7 2020 Compliance Form.

WUE Data Portal Entry Exceptions

The data from the tables below will not be entered into WUE Data Portal tables. These tables will be submitted as separate uploads, in Excel, to WUE Data Portal.

Process Water Deduction

SB X7-7 tables 4-C, 4-C.1, 4-C.2, 4-C.3, 4-C.4 and 4-D

A supplier that will use the process water deduction will complete the appropriate tables in Excel, submit them as a separate upload to the WUE Data Portal, and include them in its UWMP.

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☐	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	61,658
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**2020 Deductions**					**2020 Gross Water Use**
		Exported Water *	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	8,194	-	-	-	-	-	**8,194**

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Stafford/SCWA
This water source is *(check one)* **:**	
☑	The supplier's own water source
☑	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	8,194	-	8,194

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

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

NOTES

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
8,194	61,658	**119**
NOTES:		

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD (Enter "0" if Adjustment Not Used)			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
119	-	-	-	-	119	139	**YES**

[1] *All values are reported in GPCD*

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

NOTES:

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

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target** **GPCD**
173	**139**
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
162	154	139	**139**

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

NOTES:

NORTH MARIN WATER DISTRICT

Appendix G

Water Shortage Contingency Plan

NORTH MARIN
WATER DISTRICT

Water Shortage Contingency Plan
2020 Update
North Marin Water District

June 2021

NORTH MARIN WATER DISTRICT

TABLE OF CONTENTS

1. INTRODUCTION 1
2. WATER SUPPLY RELIABILITY ANALYSIS 2
3. PRIOR DROUGHT ACTIONS 3
4. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES 4
5. WATER SHORTAGE LEVELS 8
6. SHORTAGE RESPONSE ACTIONS 10
6.1. Supply Augmentation 10
6.2. Demand Reduction Methods 10
6.2.1. Defining Water Features 16
6.3. Operational Changes 16
6.4. Prohibitions on End Uses 16
6.5. Shortage Response Action Effectiveness 16
1.1.1. Baseline Water Use Profile 16
1.1.2. Shortage Response Action Effectiveness 21
6.6. Emergency Response Plan 22
7. SEISMIC RISK ASSESSMENT 24
8. COMMUNICATION PROTOCOLS 26
9. COMPLIANCE AND ENFORCEMENT 28
10. LEGAL AUTHORITIES 29
11. FINANCIAL CONSEQUENCES OF WSCP 30
12. MONITORING AND REPORTING 31
13. WSCP REFINEMENT PROCEDURES 32
14. PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY 33
15. REFERENCES 34

NORTH MARIN WATER DISTRICT

TABLES

Table 4-1 Annual Assessment Procedures Decision-Making Timeline
Table 5-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)
Table 6-1 Demand Reduction Actions (DWR Table 8-2)
Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)
Table 6-3 Baseline Residential Per Capita Water Demand
Table 6-4 Baseline Water Use Profile
Table 6-5 Preparation Actions for a Catastrophe
Table 9-1 Water Shortage Contingency Plan — Penalties and Charges

ATTACHMENTS

Attachment 1. Sonoma County Water Agency Annual Water Supply and Demand Assessment Procedures
Attachment 2. Drought Response Tool Quantitative Assessment
Attachment 3. 2018 Marin County Multi-Jurisdictional Local Hazard Mitigation Plan
Attachment 4. Sonoma County Water Agency Local Hazard Mitigation Plan
Attachment 5. Water Shortage Contingency Plan Resolutions

NORTH MARIN WATER DISTRICT

1. INTRODUCTION

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

North Marin Water District's (NMWD's or District's) Water Shortage Contingency Plan (WSCP) has been developed to serve as a flexible framework of planned response measures to mitigate future water supply shortages. This WSCP builds upon and supersedes the WSCP that was presented in the 2015 Urban Water Management Plan (UWMP).

The WSCP includes the stages of response to a water shortage caused by drought or by supply interruptions caused by infrastructure failure, regulatory mandate, or catastrophic human-caused or natural events. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. The WSCP also includes procedures to conduct an annual assessment of water supply and demand in order to determine whether water shortage conditions are likely to exist in the forthcoming year, and to proactively begin the process of implementing WSCP stages of action, as appropriate.

This WSCP has been prepared in accordance with California Water Code (CWC) CWC § 10640 and CWC § 10632 of the Urban Water Management Plan (UWMP) Act. Text from the UWMP Act has been included in grey text boxes with italicized font at beginning of relevant sections of this WSCP. The information presented in the respective WSCP sections and the associated text and tables are collectively intended to fulfill the requirements of that sub-section of the UWMP Act.

It should be noted that the WSCP is being updated at the same time the North Marin Water District is going through a water shortage emergency and that the previous WSCP (updated in 2016) has been activated to respond to the current situation. If the water shortage continues into subsequent years, this updated plan may be used to respond and guide further actions.

NORTH MARIN WATER DISTRICT

2. WATER SUPPLY RELIABILITY ANALYSIS

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

This section provides a summary of the District's water supply reliability analysis, recognizing that the WSCP is intended to be a standalone document that can be adopted and amended independently.

The District relies and plans to rely on two main water supply sources, including surface water supplies from the Sonoma County Water Agency (SWCA) and local surface water (i.e., Stafford Lake).

The reliability analysis was performed based on, among other things, SWCA's water reliability analysis and the District's local surface water supplies. Based on the service reliability analysis, the District is expected to have adequate water supplies during normal years, single dry years, and multiple dry years to meet projected demands through 2045.

A Drought Risk Assessment (DRA) was also conducted during the water supply reliability assessment, which evaluates the effects on available water supply sources of an assumed five-year drought commencing the year after the assessment is completed (i.e., from 2021 through 2025). Based on the DRA, the District is expected to have sufficient water supply from 2021 to 2025 in this multi-year drought scenario, although as described in this WSCP, there are a number of actions that the District will implement to reduce demands and further ensure supply reliability at various levels of water shortage.

NORTH MARIN WATER DISTRICT

3. PRIOR DROUGHT ACTIONS

The District has historically developed different strategies for reducing water demand during water shortages. The District's actions in response to the recent severe drought that occurred in California between 2014 and 2017 are discussed below.

On 1 April 2015, Governor Brown issued the fourth in a series of Executive Orders regarding actions necessary to address California's severe drought conditions. Executive Order B-29-15 directed the State Water Resources Control Board (SWRCB) to impose the first ever mandatory restrictions on urban water suppliers to achieve a statewide 25% reduction in potable urban water usage through February 2016. The Executive Order also required commercial, industrial, and institutional (CII) users to implement water efficiency measures, prohibited irrigation with potable water of ornamental turf in public street medians, and prohibited irrigation with potable water outside newly constructed homes and buildings that were not delivered by drip or microspray systems, along with numerous other directives.

On 5 May 2015, the SWRCB adopted Resolution 2015-0032 that mandated minimum actions by water suppliers and their customers to conserve water supplies into 2016 and assigned a mandatory water conservation savings goal to each water supplier based on a measurement of their residential water use in gallons per capita per day (R-GPCD). The Office of Administrative Law approved the regulations and modified the CWC on 18 May 2015. On 2 February 2016, the SWRCB voted to extend the emergency regulations until October 2016 with some modifications. On 9 May 2016, the Governor issued Executive Order B-37-16, which directed the SWRCB to extend the emergency regulations through the end of January 2017 as well as make certain water use restrictions permanent. On 18 May 2016, the SWRCB adopted Resolution 2016-0029 that adjusted the water conservation savings goal and replaced the February 2016 emergency regulation. The SWRCB may take separate action to make some of the requirements of the regulations permanent in response to the Executive Order.

The mandatory conservation standards included in CWC § 865(c) range from 8% for suppliers with an R-GPCD below 65 R-GPCD, up to 36% for suppliers with an R-GPCD of greater than 215 GPCD. As with previous emergency drought regulations adopted by the SWRCB in 2014, the new water conservation regulation was primarily intended to reduce outdoor urban water use. Based on their R-GPCD, the District was required to reduce water use by 24% relative to its 2013 water use.

Through enactment of its 2010 WSCP, the District surpassed these reduction targets. During the June 2015 through May 2016 compliance period, the District surpassed its water use reduction target with a cumulative savings of 31% relative to its 2013 use.

In June 2016, the District adopted its 2015 UWMP and associated WSCP update. In April 2017, the Governor Brown ended the drought State of Emergency.

In March 2021, the District activated the 2016 WSCP to respond to a water shortage emergency and approved Emergency Water Conservation Ordinance 41 for the Novato Service Area. The Ordinance was subsequently amended in April and May of 2021 to add specific water use prohibitions to go into effect 1 July 2021 aimed at a 20% reduction in water use as compared to 2020. Ordinance 41 calls for 20% voluntary reductions through 30 June 2021 and a service area wide mandatory reduction of 20% from 1 July 2021 to 1 November 2021.

NORTH MARIN WATER DISTRICT

4. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

☑ ***CWC § 10632 (a) (2)***

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

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

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

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

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

(iii) Existing infrastructure capabilities and plausible constraints.

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

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

☑ ***CWC § 10632.1***

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

☑ ***CWC § 10632.2***

An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

On an annual basis, the District will conduct an Annual Assessment to identify whether there is likely to be a water shortage condition in the following year. Because the District's substantial source of potable water supply is from SCWA, the evaluation of SCWA supplies for a particular year will be based on information provided by SCWA.

For purposes of this assessment, a water shortage condition is defined as an anticipated shortfall of up to 20%, corresponding to Water Shortage Level 2. Each element of the Annual Assessment is described

below, along with the key data inputs and methodologies for determining these elements, and expected timing of the decision process.

1. Evaluation Criteria

The evaluation criteria that will be used to identify whether the District is likely to experience a water shortage in the coming year include:

a. SCWA Available Supply –SCWA will develop and present the draft annual assessment to the Technical Advisory Committee (TAC) at the April meeting. The final annual assessment will be presented at the June TAC meeting. The District is a member of the TAC and the Water Advisory Committee (WAC) that represents the major cities and water districts that receive water delivered by Sonoma Water aqueduct system. The District will conduct the Annual Assessment regarding the SCWA available supply as part of a coordinated effort led by SCWA.

Further details about the evaluation criteria and procedure used by SCWA in conducting an Annual Assessment could be found in **Attachment 1** of this WSCP. As discussed in **Attachment 1**, evaluation criteria used by SCWA include:

- Unconstrained customer demand for each of SCWA's wholesale customers, considering weather, growth, and other influencing factors;
- Russian River operations, including current reservoir releases from Lake Sonoma and Mendocino and anticipated releases to meet in-stream flow requirements and water demand;
- Hydrology and watershed conditions, including Lake Sonoma and Lake Mendocino cumulative inflows and storage levels, soil moisture, and snowpack; and
- Potter Valley Project inflows, including Lake Pillsbury storage levels and observed and projected project transfers.

b. Stafford Lake Available Supply –The Stafford Lake supply availability is not the primary driver when considering a water shortage condition. It is possible that in a given year, this supply may be low or limited and yet the SCWA supply is not. In general, a normal rainfall year provides sufficient runoff to fill the lake allowing for production from this source to supplement SCWA supply.

c. State Regulatory Conditions - Evaluation of any state-mandated drought or water use restrictions known during preparation of the Annual Assessment.

These criteria will be assessed by District staff with detailed knowledge of District operations. The data used to support these assessments may include, but are not limited to: regional rainfall data, SCWA lake storage levels and Forecast Informed Reservoir Operation (FIRO) outputs, annual Marin County briefing by the Monterey Office of the National Weather Service, "Precipitation

Outlook" data (1-3 month outlooks) from the National Oceanic and Atmospheric Administration's (NOAA's) Climate Prediction Center, and system demand.

2. Water Supply

   On the basis of the evaluation criteria above and available supporting information, the District will quantify the projected available supply over the forthcoming year. This quantification will likely be a range, and subject to revision as new data are available and as conditions evolve.

3. Unconstrained Customer Demand

   Unconstrained customer demands (i.e., the expected water use in the absence of shortage-caused reductions in water use) will be evaluated and estimated for the forthcoming year based on:

   - A comparison of monthly customer demands relative to prior years (e.g., last 3 years),
   - Evaluation of current and anticipated weather conditions,
   - New demands anticipated during the coming year (e.g., new accounts coming online), and
   - Any other potentially pertinent factors identified by the District (e.g., pandemic-related stay-at-home orders).

4. Planned Water Use for Current Year Considering Dry Subsequent Year

   The District will compare the estimated unconstrained demands to the anticipated supplies for the current year, assuming that the following year will be dry (i.e., a 20% supply shortfall), using the Evaluation Criteria identified above.

5. Infrastructure Considerations

   The District will evaluate how infrastructure capabilities and constraints may affect its ability to deliver supplies to meet expected customer water demands in the coming year. The constraints and capabilities are expected to include, among other things:

   - Anticipated capital projects and upgrades, and
   - Anticipated maintenance and repairs.

6. Team Members and Decision Makers

   Key team members involved in the evaluation and decision-making process described herein include key staff of the Engineering and Operations Departments, the Auditor-Controller, and the General Manager.

7. Timeline

Table 4-1 Annual Assessment Procedures Decision-Making Timeline

Decision-Making Step	Start Date	End Date
Determining water supplies by source for the current year	December	January
Calculating the water supply reliability using spreadsheet, computer model, or other method	March	April
Determining shortages and response actions	April	May
Preparing and presenting preliminary report to District Board	February	May
Updating assessment based on final water supplies	April	May
Using WSCP to activate the appropriate protocols	April	May
Obtain Draft Annual Assessment from SCWA; Provide Comments on SCWA Draft Assessment; Incorporate the SCWA's draft Annual Assessment to the District's Annual Assessment	April	April
Preparing annual water shortage assessment report	April	May
Preparing decision-making documents for approval	April	May
Obtain Final Annual Assessment from SCWA and update the District's assessment	May	June
Implementing WSCP actions as approved	May	June
Sending final annual water shortage assessment report to the State	June	No later than July 1st of each year beginning in 2022
NOTES:		

Consistent with California Water Code (CWC) § 10632.1, the District will perform and submit an Annual Assessment to DWR by July 1st of each year beginning in 2022.

NORTH MARIN WATER DISTRICT

5. WATER SHORTAGE LEVELS

☑ ***CWC § 10632 (a) (3)***

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

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

Consistent with the requirements of CWC § 10632(a)(3), this WSCP is based on the six water shortage levels (also referred to as "stages") shown in **Table 5-1**. These stages are intended to address shortage caused by any condition, including the catastrophic interruption of water supplies.

Table 5-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	• Determination based on specific Dry Conditions as determined by the District, SCWA, or SWRCB that the District must reduce water use by up to 10%.
2	Up to 20%	• Determination based on specific Dry Conditions or a Temporary Impairment of water supply as determined by the District, SCWA, or SWRCB that the District must reduce water use by up to 20%.
3	Up to 30%	• Determination based on Dry Conditions or a Temporary Impairment of water supply as determined by the District, SCWA, or SWRCB that the District must reduce water use by up to 30%.
4	Up to 40%	• Determination based on specific Critical Dry Conditions or a Temporary Impairment of water supply as determined by the District, SCWA, or SWRCB that the District must reduce water use by up to 40%.
5	Up to 50%	• Determination based on specific Critical Dry Conditions or a Temporary Impairment of water supply as determined by the District, SCWA, or SWRCB that the District must reduce water use by up to 50%.
6	>50%	• Determination based on specific Critical Dry Conditions or a Temporary Impairment of water supply as determined by the District, SCWA, or SWRCB that the District must reduce water use by more than 50%.
NOTES:		

6. SHORTAGE RESPONSE ACTIONS

☑ ***CWC § 10632 (a) (4)***

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

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

☑ ***CWC § 10632 (b)***

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

This section describes the response actions the District will take to deal with the shortages associated with each of the six stages enumerated in Section 5. The response actions consist primarily of demand reduction measures and associated penalties or charges as well as enforcement and operational changes as detailed in the tables below.

6.1. Supply Augmentation

There are currently no supply augmentation actions planned in the District's shortage response actions. However, as discussed in Section 6.7 of the UWMP, potential transfer and exchange opportunities exist with other SCWA contractors under the Restructured Agreement.

6.2. Demand Reduction Methods

Consumption reduction methods are actions that are taken by the District to reduce water demand within the Novato service area. These actions, summarized in **Table 6-1** and **Table 6-2**, include expanded customer outreach, various customer rebates, decreased line flushing, increased water waste patrols and a Drought Revenue Recovery Surcharge. The monthly and cumulative annual water savings impacts associated with each restriction, prohibition and consumption reduction method were quantitatively estimated using the Drought Response Tool (DRT) for each stage of action, as described in Section 6.5 and included in **Attachment 2**.

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
1	Other	Up to 10 percent	1. Encourage the non-commercial washing of privately-owned motor vehicles, trailers and boats only from a bucket and except that a hose equipped with a shut-off nozzle may be used for a quick rinse. 2. Request restaurants, hotels, cafes, cafeterias, bars or other public places where food or drink are served/purchased to serve water only upon request. 3. Navy style showering will be promoted (e.g., turn on water to wet person or persons, turn off water, lather up, scrub, then turn on water for a quick rinse, then turn off shower with free push button showerhead control valves available to customers upon request). 4. Request hotel and motel operators to provide guests with the option of choosing not to have towels and linens laundered daily. 5. Enforce water-waste prohibitions as defined in District Regulation 15, Section B. 6. Prohibit washing of sidewalks, driveways, parking areas, tennis courts, patios or other exterior paved areas except by the Novato Fire Protection District or other public agency for the purpose of public safety.	No
2	Other	Up to 20 percent	1. Continue with action and measures from Stage 1 except where superseded by more stringent requirements. 2. Prohibit use of potable water for dust control at construction sites or other locations. 3. Prohibit any use of potable water from a fire hydrant except for fighting fire, human consumption, essential construction needs or use in connection with animals. 4. Require repair of all leaks within 48 hours. 5. Restrict irrigation to three days per week, between the hours of 7pm and 9am. 6. Prohibit refilling completely drained swimming pools and/or initial filling of any swimming pools.	Yes

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
3	Other	Up to 30 percent	1. Continue with action and measures from Stage 2 except where superseded by more stringent requirements. 2. Prohibit non-commercial washing of privately-owned motor vehicles, trailers and boats except from a bucket and except that a hose equipped with a shut-off nozzle may be used for a quick rinse. 3. Prohibit watering of any lawn, garden, landscaped area, tree, shrub or other plant except from a hand-held hose or container or drip irrigation system. Sprinklers can be used if customer maintains the volume or percent reduction pursuant to the NMWD Board of Directors determination compared to a prior year's use in same billing period. 4. Prohibit potable or raw watering any portion of a golf course with potable water except the tees and greens, unless the customer maintains the specified water use reduction and mandated by the District. 5. Prohibit any non-residential use by a vehicle washing facility in excess of the volume percent or reduction pursuant to the NMWD Board of Directors determination. 6. Restrict landscape irrigation to two days per week between the hours of 7pm and 9am the following day. 7. Prohibit landscape irrigation during or within 48 hours of measurable precipitation. 8. Prohibit irrigating with potable water of lawn area on public street medians.	Yes
4	Other	Up to 40 percent	1. Continue with action and measures from Stage 3 except where superseded by more stringent requirements. 2. Limit irrigation to one day per week between the hours of 7pm and 9am the following day. 3. Planting any new landscaping, except for designated drought resistant landscaping authorized by NMWD.	Yes

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
			4. Golf courses may only use private well or recycled water for general irrigation. 5. No new annual plants, vegetables, flowers or vines may be planted until the Stage 4 mandatory period is over. An exception will be considered on a case by case basis for customers who are eliminating existing thirsty landscaping and replacing same with drought resisting landscaping prescribed by NMWD. 6. Prohibit use of single-pass cooling systems.	
5	Other	Up to 50 percent	1. Continue with action and measures from Stage 4 except where superseded by more stringent requirements. 2. Watering any residential lawn, or any commercial or industrial area lawn maintained for aesthetic purposes, at any time day or night during the period of March 1, through September 30. (These designated lawns will be allowed to dry up for the summer). Affected customers will be advised on tested methods for re-greening the lawns at minimum expense beginning on October 1, during a Stage 4 mandatory period if operating conditions permit. By following the prescribed instructions, the affected customers will likely avoid the cost of replacing lawns.) 3. All day and nighttime sprinkling will be discontinued. Any and all outside watering will be done only with a hand-held nozzle. An exception will be made to permit drip irrigation for established perennial plants and trees using manual or automatic time-controlled water application sufficient only for assured plant survival. 4. Limit deliveries of water to outside service area customers to that needed for human consumption, sanitation and public safety only or as stipulated in outside service agreements.	Yes
6	Other	Greater than 50 percent	1. Continue with action and measures from Stage 5 except where superseded by more stringent requirements.	Yes

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
			2. All residential and CII customers shall reach a water reduction of fifty five percent (55 percent) from previous use.	
NOTES:				

NORTH MARIN WATER DISTRICT

Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*
1	Other	Up to 10 percent	1. Distribute water bill inserts with information about water shortage and conservation. 2. Distribute special issue of WaterLine newsletter. 3. Encourage voluntary rationing. 4. Pursue vigorous enforcement of water wasting regulations and provisions of the District's Water Conservation Regulation 15. 5. Request customers to make conscious efforts to conserve water. 6. Request other governmental agencies to demonstrate leadership and implement restrictive water use programs. 7. Distribute water saving kits upon customer request, to assure availability to existing and new customers. 8. Encourage private sector use of alternate sources of water such as recycled water or private wells. 9. Encourage nighttime irrigation 10. Customers will be urged not to regularly flush their toilets for disposal of urine only.
2	Other	Up to 20 percent	1. Continue with actions and measures from Stage 1 except where superseded by more stringent requirements. 2. Promote District water conservation and rebate programs. 3. The District can back-feed Stafford Lake using SCWA water to offset local supply shortage in the lake.
3	Other	Up to 30 percent	1. Continue with action and measures from Stage 2 except where superseded by more stringent requirements.
4	Other	Up to 40 percent	1. Continue with action and measures from Stage 3 except where superseded by more stringent requirements.
5	Other	Up to 50 percent	1. Continue with action and measures from Stage 4 except where superseded by more stringent requirements. 2. Increase enforcement and water waste patrols.
6	Other	Greater than 50 percent	1. Continue with action and measures from Stage 5 except where superseded by more stringent requirements.
NOTES:			

6.2.1. Defining Water Features

☑ ***CWC § 10632 (b)***

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

As required by CWC §10632 (b), the District distinguishes between "decorative water features" such as ponds, lakes, and fountains that are artificially supplied with water and "recreational water features" such as swimming pools and spas.

6.3. Operational Changes

The water shortage response actions included in **Table 6-2** include operational changes that the District will implement during each stage of action, including measures to: 1) reduce system losses through a reduction in line flushing and fire training exercises, (2) increase enforcement and patrols, (3) proactive calls to customers, and (4) conduct leak surveys during droughts.

6.4. Prohibitions on End Uses

Restrictions and prohibitions associated with each stage in the District's WSCP are presented in **Table 6-1**. As discussed above, these responses focus on the reduction of non-essential water uses such as ornamental landscape irrigation, and preserve water uses that are essential to the health, safety, welfare, and economic vitality of the District's customers. In addition, mandatory prohibitions are enforced at all times (see **Table 6-1**).

6.5. Shortage Response Action Effectiveness

In order to evaluate and ensure that effective actions will be implemented with the proper level of intensity, the District employed the DRT, an Excel spreadsheet model developed by EKI Environment and Water, Inc. The DRT model calculates monthly savings anticipated by implementing each stage of action as detailed below.

6.5.1. Baseline Water Use Profile

Using the DRT, the District developed a pre-drought baseline water use profile that reflected usage patterns within the District's service area by major water use sector in fiscal year (FY) 2019 that was used to guide development of the WSCP. Key findings from this analysis are presented below.

Residential Per Capita Demand

The District's baseline residential gallons per capita per day (R-GPCD) demand during FY 2019 was approximately 81 R-GPCD. As shown in **Table 6-3** and its associated chart, this R-GPCD is lower than the statewide average of 85 R-GPCD.

Proportion of Outdoor Water Use

As shown on **Table 6-4** and associated charts, outdoor water use, which can generally be considered as a "discretionary water use", was estimated to be approximately 52% of the District's potable consumption during this pre-drought time period. Dedicated irrigation meters for potable water accounted for 9% of the total potable irrigation demand. The remaining irrigation water uses within the District's service area are supplied by recycled water.

The DRT estimates indoor water use to be equivalent to the lowest monthly water use for each sector, accounting for the number of days in each month. Outdoor water use for each sector was estimated to be the difference between the total water use and the estimated indoor water use. If District customers tend to irrigate more heavily during winter months, an underestimation of the proportion of outdoor water use would occur.

The proportion of outdoor water use within the residential and commercial sectors is estimated to be 50%. This indicates that there is the potential to achieve significant potable water savings across these sectors, simply by focusing on outdoor uses. If the proportion of outdoor water use is being underestimated by the DRT method, then even more substantial savings may be achieved through targeting outdoor water use. As further shown in **Table 6-4** and its associated charts, the seasonal variation in baseline potable water use reflects increased irrigation demands during the summer and fall months. Therefore, the greatest potential for reductions in non-essential water use are expected during these months.

Table 6-3 Baseline Residential Per Capita Water Demand

	Baseline Residential Per Capita Water Demand (R-GPCD)
NMWD (a)	81
Statewide Average (c)	85
NOTES: (a) District R-GPCD calculated using 2019 metered data. (b) State-wide R-GPCD for 2019 obtained from data provided at California State Water Resources Control Board Water Conservation Portal - Conservation Reporting, http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml, accessed March 2021.	

Chart 6-3 Baseline Residential Per Capita Water Demand

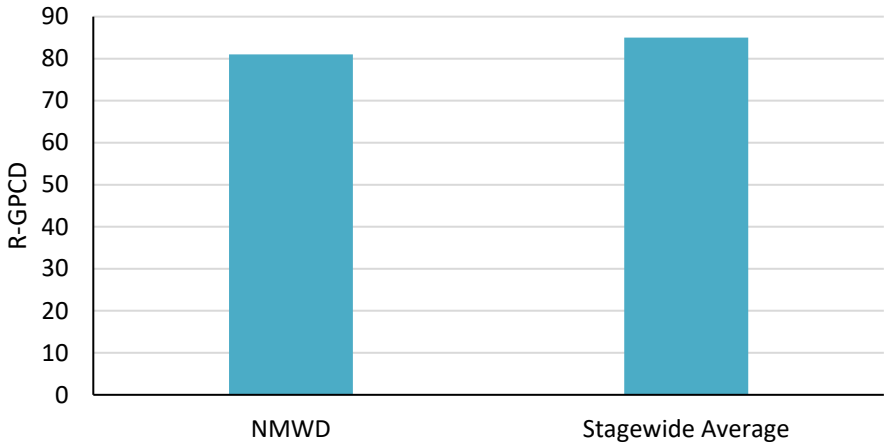


Table 6-4 Baseline Water Use Profile

Sector	End-Use	Baseline (2019) Water Use													Annual % of Total by Sector
		July	August	September	October	November	December	January	February	March	April	May	June	Annual	
Residential	Indoor	240	240	232	240	232	240	240	216	240	232	240	232	2,821	50.3%
	Outdoor	446	327	557	351	306	183	164	57	87	0	114	197	2,789	49.7%
	Subtotal Residential	686	567	789	591	538	423	403	274	326	232	354	429	5,611	
CII	Indoor	51	51	50	51	50	51	51	46	51	50	51	50	605	49.8%
	Outdoor	135	50	121	48	50	23	22	8	18	0	101	33	609	50.2%
	Subtotal CII	186	101	171	100	99	74	73	54	69	50	153	83	1,214	
Dedicated Irrigation	Outdoor	157	60	189	59	100	29	31	4	14	3	27	27	699	100%
Non-Revenue	Non-Revenue	55	34	64	40	42	25	27	16	21	13	28	27	392	100%
Total	Indoor	291	291	282	291	282	291	291	263	291	282	291	282	3,426	43.3%
	Outdoor	738	437	867	458	456	235	217	69	119	3	242	257	4,097	51.8%
	Non-Revenue	55	34	64	40	42	25	27	16	21	13	28	27	392	5.0%
	Total	1,084	762	1,213	789	780	551	535	348	431	298	561	565	7,916	

NOTES:
(a) Volumes are in units of AF.
(b) Indoor water use was estimated to be the lowest monthly water use for each sector, accounting for the number of days in each month. Outdoor water use for each sector was estimated to be the difference between the total water use and the estimated indoor water use.

Chart 6-4A Baseline Year (2019) Annual Water Use by Sector and End Use

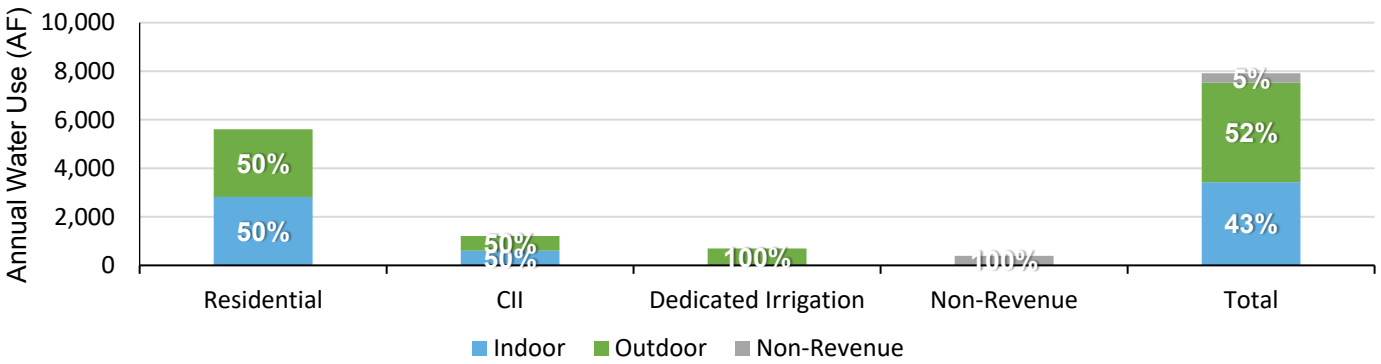
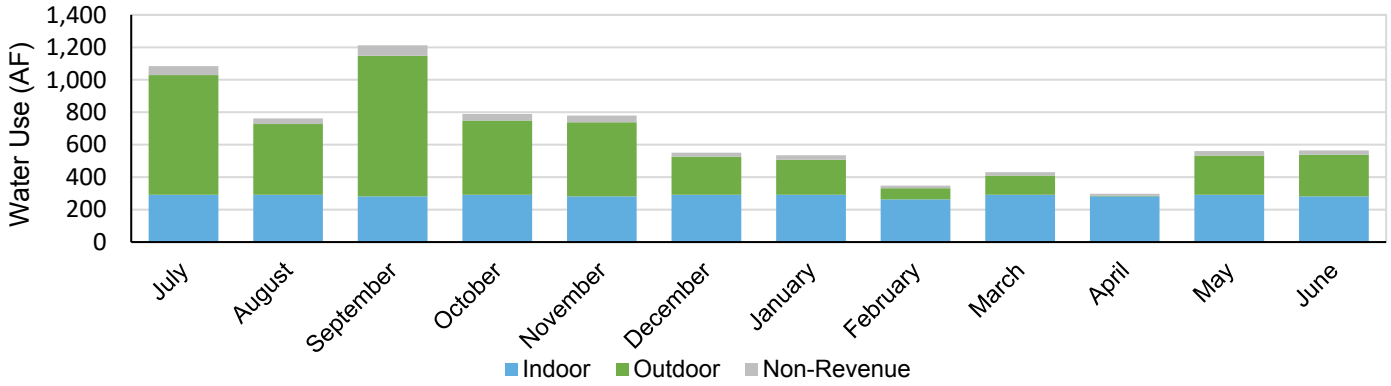


Chart 6-4B Baseline Year (2019) Monthly Indoor vs. Outdoor Water Use



6.5.2. Shortage Response Action Effectiveness

The DRT provides a quantitative framework that allows the District to systematically estimate the monthly and cumulative annual demand reductions expected to result from particular combinations of drought response actions and associated implementation rates. Data inputs to the DRT include total production, class-specific water use, population, and assumptions regarding the split between indoor and outdoor water use for each customer class.

For each drought response action, the user specifies:

- The customer class(es) and end use(s) that are affected;
- The percent savings for that end use for each account that implements the action. These are based on evaluations reported in the literature, or where such studies are not available, on best estimates based on the District's experience; and
- The percentage of accounts assumed to implement the action, which is presumed to be the result of the intensity level of the District's program implementation, including but not limited to, marketing and enforcement activities.

An additional critical DRT user input is a set of constraints on demand reductions to ensure that usage levels do not endanger health and safety or result in unacceptable economic impacts. The DRT will not permit estimated usage reductions to violate these constraints, regardless of the demand reduction actions selected. The constraints are:

- A minimum residential indoor per capita daily usage of 25 gallons,
- A maximum residential outdoor usage reduction of 100%,
- A maximum Commercial, industrial, and institutional (CII) indoor usage reduction of 30%, and
- A maximum CII outdoor usage reduction of 100%.

Based on the foregoing data, the DRT model calculates the resulting monthly savings. The District adjusted the combination of actions and implementation levels to achieve the targeted savings levels at each of the six stages of action.

For each stage of action, the modeling targeted the mid-range of the required demand reduction range, ergo:

- 5% for Stage 1,
- 15% for Stage 2,
- 25% for Stage 3,
- 35% for Stage 4,
- 45% for Stage 5, and
- 55% for Stage 6.

The key DRT inputs and outputs for each of the stages of action are reproduced in **Attachment 2**.

Table 6-1 and **Table 6-2** shows the water shortage reduction actions, savings assumptions, and implementation rates that are required for the District to achieve the required annual demand reductions for each of the six stages of action. At each stage, there are two types of demand-reduction actions identified:

- Restrictions on customer water usage; and
- Consumption reduction actions by the District to encourage decreased water usage.

Many actions are implemented across a number of stages, some at increasing implementation levels. Therefore the actions in **Table 6-1** and **Table 6-2** are listed as a row under the first stage at which they are implemented. The percentages shown in the tables represent end user savings.

6.6. Emergency Response Plan

In accordance with the Emergency Services Act, the District has developed an Emergency Operation Plan (EOP). This EOP guides response to unpredicted catastrophic events that might impact water delivery including regional power outages, earthquakes, or other disasters. The EOP outlines standard operating procedures for all levels of emergency, from minor accidents to major disasters. The EOP has been coordinated with the SCWA and neighboring water purveyors. In addition, the District is a member of the California Water/Wastewater Agency Response Network (CalWarn) which provides mutual aid assistance between neighboring water agencies in the event of an emergency.

Table 6-5 summarizes some of the actions in the event of specific catastrophic events.

Table 6-5 Preparation Actions for a Catastrophe

Possible Catastrophe	Summary of Actions
Earthquake	• Perform assessments of District facilities and provide inspection reports per the EOP • Perform corrective actions to damaged facilities • Shut-off isolation valves and above ground use of flexible piping for ruptured mains
Fire	• Monitor system performance and override controls to optimize flow to zone effected • Activate additional system pumping • Monitor tank storage levels and keep levels as high as possible • Coordinate communications to customers with Fire Department • Storage supplies for fire flows
Power outage or grid failure	• Coordinate with PG&E and Marin EOC • Note: Portable emergency generators available for most SCWA facilities and key NMWD facilities
Severe Winter Storms	• Schedule stand-by personnel • Check underground facility sump pumps • Monitor NWS weather updates • Note: Portable emergency generators available for most SCWA facilities and key NMWD facilities
Hot Weather	• Coordinate with PG&E and Marin EOC • Note: Portable emergency generators available for most SCWA facilities and key NMWD facilities
NOTES: Infrastructure Priority: 1 = sources of supply; 2 = storage reservoirs; 3 = pump stations. Communication and reporting to City of Novato EOC and/or Marin County Emergency Operations Center (Marin EOC) per EOP.	

NORTH MARIN WATER DISTRICT

7. SEISMIC RISK ASSESSMENT

☑ ***CWC § 10632.5***

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

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

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

Impacts associated with earthquakes and liquefaction are discussed in the *2018 Marin County Multi-Jurisdictional Local Hazard Mitigation Plan* (County LHMP; Marin County, 2018*)*, which is included in **Attachment 3**. The MCM LHMP assesses Marin County's vulnerabilities to various hazards, including seismic hazards, and presents mitigation strategies that are planned over the next five years. As of 2021, Marin County is currently in the process updating its LHMP, using a multijurisdictional planning approach overseen by a steering committee made up of various stakeholders, including the District.

The County LHMP includes a discussion of the probability of a seismic event affecting Marin County, citing an ABAG projection of a 52 percent chance of an earthquake of magnitude 6.7 of greater on one of the faults affecting Marin County between now and 2036. The County LHMP notes that much of the Marin County infrastructure is located in areas of Bay Mud, as well as in current and former marshlands that have been artificially filled. These areas are vulnerable to liquefaction during seismic events. The County LHMP includes an assessment of the County's vulnerability in the event of a major seismic event, and estimates that an earthquake on the San Andreas Fault of magnitude 7.8 would result in a total building damage of approximately $1.26 trillion.

Further discussion of seismic risks specific to the SCWA water system is provided in the *Sonoma County Water Agency Local Hazard Mitigation Plan,* dated 16 October 2018 (SCWA LHMP; SCWA, 2018), which is included in **Attachment 4**. The SCWA LHMP specifically assesses SCWA's natural hazard risks and vulnerabilities facing the SCWA infrastructure and provides a plan of action to address these vulnerabilities. The SCWA LHMP identifies a series of mitigation measures to address seismic risk, including seismic retrofits of distribution system components to protect against damage due to liquefaction and lateral spread hazard and installation of automated throttling valves at aqueducts and interties to minimize uncontrolled releases out of SCWA facilities. For more detail regarding planned mitigation measures to address seismic risks, please refer to **Attachment 4**.

As part of any capital project design for key infrastructure such as pump stations, major pipelines, and storage tanks, the District employs the expertise of a geotechnical engineer to evaluate seismic risks for the project. These projects subsequently include design elements that minimize that risk such flexible expansion joints, anchoring systems, and others. The District performed a comprehensive seismic risk assessment of all Novato Service Area water storage tanks in 1997, including a long-term capital improvement plan to retrofit existing tanks to better withstand an earthquake (NMWD, 2019).

The District's Stafford Lake Dam (No. 88.000) is inspected and monitored regularly in accordance with the State's Division of Safety of Dams (DSOD) protocols. The dam inspection and monitoring program includes a comprehensive instrumentation system consisting of piezometers, seepage monitoring, and survey monumentation (elevation and lateral movement), with annual reporting to the state. In addition, the District updated the Emergency Action Plan for the Stafford Dam in 2020 in coordination with the DSOD and the California Office of Emergency Services (CalOES).

NORTH MARIN WATER DISTRICT

8. COMMUNICATION PROTOCOLS

☑ ***CWC § 10632 (a) (5)***

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

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

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

(C) Any other relevant communications.

Each stage of the WSCP is implemented with a formal declaration by the District Board of Directors upon the determination that SCWA or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use due to a water supply shortage or emergency.

Even before formal declaration of a water shortage, a public information program will be activated to provide customers with as much advance notice as possible. Following declaration of a shortage, District customers would need to be provided notice of water shortage rules and regulations via a variety of media and communications methods.

Coordination between the District and with other public agencies can begin prior to formal declaration of a water shortage and can be accomplished through regular meetings, e-mail group updates, and presentations. In a regional water shortage scenario, the District would use public outreach resources and materials provided by SCWA. In addition to these materials, the District may develop its own materials to communicate with customers, such as a dedicated customer service hotline, and expand its normal public outreach to support its water conservation efforts (see Chapter 9 of the 2020 UWMP).

As discussed in Chapter 9 of the 2020 UWMP, the several District staff members jointly share the responsibility for water conservation. Staff time dedicated to water conservation and enforcement action will increase with the severity of a supply shortage. Additional duties may be assigned to current employees or hiring of temporary staff may be considered to meet staffing needs during extreme water shortages.

In the event of a current or predicted water shortage, the District will communicate all pertinent water shortage information, including but not limited to shortage response actions triggered, to customers, the public, and government agencies through the following methods, as determined by the District at the time of the water shortage to be most effective and appropriate for communicating said information:

- Direct mail newsletter to customers;
- Email blast to customers;
- Social media posts;
- Newspaper advertisements and public notices;
- Website updates; and

- Bill inserts and bill text announcements.

NORTH MARIN WATER DISTRICT

9. COMPLIANCE AND ENFORCEMENT

☑ ***CWC § 10632 (a) (6)*** *For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

Table 9-1 summarizes the penalties, charges and other enforcement actions for any customer violating the District's rules and regulations related to water use prohibitions and the District's WSCP. Customers in violation will receive a written or verbal warning and order that the violation be corrected immediately or within a specified time determined to be reasonable. Water service may be disconnected due to non-compliance with the warning. If water service is disconnected, a reconnection fee of $35 shall be paid. If that violation reoccurs, water service may be disconnected again with a reconnection fee of $35. Any water service that is disconnected twice shall be reconnected with a flow-restricting device. The District may also impose additional administrative charges, penalties, and water shortage surcharges in an amount approved by the Board of Directors from time to time.

Table 9-1 Water Shortage Contingency Plan — Penalties and Charges

Penalty or Charge	Stage When Penalty Takes Effect
Written Notice with time frame for correction	Any Stage
Personal contact with follow up written notice	Any Stage
Installation of flow restricting device	Any Stage
Imposition of water waste fees	Any Stage
Disconnection of service	Any Stage
NOTES:	

10. LEGAL AUTHORITIES

☑ ***CWC § 10632 (a) (7)***

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

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

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

The District has authority under Water Code Section 350 through 358, Section 375 through 378, and Section 31026 through 31029 and District Ordinance 41 to require water rationing, conservation, and/or water use prohibitions, and to enforce penalties. Relevant code sections and an adopted water shortage contingency resolution are included as **Attachment 5** of this WSCP.

In the event that a water shortage is triggered, the District shall declare a water shortage emergency and shall coordinate with the City and County for the possible proclamation of a local emergency.

The District's WSCP update was adopted on 15 June 2021. The adoption ordinance is included as **Attachment 5** of this WSCP.

The District shall declare a water shortage emergency in accordance with Water Code Chapter 3 (commencing with Section 350) of Division 1 general provision regarding water shortage emergencies. The District shall coordinate with any city of county within which it provides water supply services for the possible proclamation of a local emergency. The District will also coordinate with SCWA as appropriate.

11. FINANCIAL CONSEQUENCES OF WSCP

☑ ***CWC § 10632 (a) (8)***

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

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

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

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

Since the District bills its customers per unit volume of water consumed, the District would experience a reduction in revenue upon implementation of the WSCP. To compensate for the expected revenue reduction caused by water conservation, the District reserves the authority to implement temporary water rate increases, as adopted by resolution of the District's Board of Directors (see discussion on the Temporary Drought Revenue Recovery Surcharge below). Additionally, the District's Board of Directors may adopt a resolution to establish a water rate structure, including excess water use surcharges, that provides incentives to conserve water. Individual customers may seek a waiver of excess water use surcharges through a variance process. The District also reserves the authority to reduce expenses during implementation of the WSCP, using the following potential mitigation actions:

- Reducing or deferring operation and maintenance expenses; and
- Deferring capital improvement projects.

Other potential actions to mitigate revenue impacts of the WSCP include:

- Increasing any fixed readiness-to-serve charges; and
- Using financial reserves.

In the event that mandatory water use restrictions or mandatory reduction in water use is triggered (Stage 2 or higher), a Temporary Drought Revenue Recovery Surcharge may be implemented. The Temporary Drought Revenue Recovery Surcharge will serve to mitigate the revenue loss resulting from a reduction in water use, as well as the liquidated damages assessed by the Sonoma County Water Agency pursuant to the water shortage and apportionment provisions of the Restructured Agreement for Water Supply. The Temporary Drought Revenue Recovery Surcharge shall be a quantity charge for each 1,000 gallons as specified in District Regulation 54.

12. MONITORING AND REPORTING

☑ ***CWC § 10632 (a) (9)*** *For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.*

The District's local surface water supply and SCWA supply turnouts are all equipped with water meters. In addition, each potable water customer is metered. Non-residential landscape irrigation is metered separately from indoor use at most non-residential sites. In addition, the District has fully implemented Automatic Meter Infrastructure (AMI) system for all meters that provides hourly and daily water use consumption data, and the District is able to document leaks, high water use and also customer demand reductions along with other water use analytics. The District contacts individual customers via email, phone call or text to resolve issues related leaks and high water use episodes.

The SCWA is in the process of converting billing (turnout) meters to automatic read technology that will result in 24-hour daily flow measurement.

The District will use an appropriate method for monitoring and reporting on the implementation of the WSCP. Monitoring metrics could include, but are not limited to water production, water consumption, gallons per capita per day, residential gallons per capita per day, water budget performance, and other metrics as determined by the District or the State at such time of the enactment of the WSCP.

13. WSCP REFINEMENT PROCEDURES

☑ ***CWC § 10632 (a) (10)*** *Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

As part of the Annual Assessment, the District's team members will review the results of prior monitoring and reporting to determine the effectiveness of the WSCP. In addition, the District will consult with other SCWA contractors and SCWA directly. If modifications to shortage response actions are needed, the District team will present the proposed modifications to the Board of Directors and request changes to the WSCP by resolution.

The WSCP is implemented as an adaptive management plan. The District will evaluate the need for revise its WSCP every year after performing its Annual Assessment. The evaluation will consider effective of WSCP actions and any anticipated water supply shortages assessed by the Annual Assessment. If the WSCP is revised, the District Board of Directors will adopt a new resolution adopting the revised WSCP, and if necessary, declare a water shortage level to implement.

14. PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

☑ ***CWC § 10632 (c)*** *The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

As described in Chapter 9 the District informed the public and the appropriate agencies of: (1) its intent to prepare a WSCP, (2) where the WSCP was available for public review, and (3) when the public hearing regarding the WSCP would be held. All notifications were completed in compliance with the stipulations of Section 6066 of the Government Code.

A copy of the adopted 2020 WSCP including any amendments will be provided to the Department of Water Resources (DWR), the California State Library, and Sonoma and Marin Counties within 30 days of the adoption (**Attachment 5**). An electronic copy of the adopted 2020 WSCP will be submitted to the DWR using the DWR online submittal tool.

A copy of the adopted 2020 WSCP will be available for public review on the District's website within 30 days after filing the plan with DWR.

15. REFERENCES

DWR, 2021. Urban Water Management Plan Guidebook 2020, Draft Final, California Department of Water Resources, March 2021.

Marin County, 2018. 2018 Marin County Multi-Jurisdictional Local Hazard Mitigation Plan, 2018.

NMWD, 2019. 2018 Novato Water System Master Plan Update, September 2019. North Marin Water District.

SCWA, 2018. Sonoma County Water Agency Local Hazard Mitigation Plan, dated 16 October 2018.

NORTH MARIN WATER DISTRICT

ATTACHMENT 1

SONOMA COUNTY WATER AGENCY ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Annual Water Supply and Demand Assessment Procedures

This section presents the procedures that will be used by Sonoma Water to conduct an annual water supply and demand assessment (annual assessment). The annual assessment is required to be submitted annually to DWR beginning on July 1, 2022. The assessment forecasts near-term water supply conditions (12 months) to ensure shortage response actions are triggered in a timely manner. The annual assessment will provide a description and quantification of each source of Sonoma Water's water supply compared to water demands for the current year and one subsequent dry year. The following subsections describe the decision-making process and data and methodologies. Sonoma Water may modify this procedure based on its experiences that it will gain from the development of the annual assessment.

Decision-Making Process

This section presents the decision-making process and timeline (see Table 1) that Sonoma Water will use each year to determine its water supply reliability. The assessment will be conducted annually and completed by July 1. Sonoma Water will conduct an annual assessment that follows the steps described below.

1. **Develop draft annual assessment.** Sonoma Water staff will compile the draft annual assessment. The draft annual assessment will document the evaluation of water supply conditions, considering projections of the demand for Sonoma Water provided by the customers by February 1. Sonoma Water staff will start conducting the assessment prior to the January Decision 1610 trigger point and then thereafter at the middle of each month prior to the trigger point at the beginning of each month through June. Decision 1610 is described later in this assessment procedure description.
2. **Submit draft annual assessment report to the customers.** The draft annual assessment will be submitted and presented to the TAC ad-hoc committee at the April meeting. An initial determination will be made regarding the potential for a water shortage condition to occur.
3. **Receive review comments.** The customers will present their review comments including their updated demands and local supply projections at the May TAC meeting.
4. **Submit final annual assessment to the TAC.** The final annual assessment will be submitted and presented at the June TAC meeting. The annual assessment may be presented to the WAC. Sonoma Water will coordinate with the customers to identify if any water supply gaps exist for each customer when considering both Sonoma Water supplies and local supplies.
5. **Optional presentation of the annual assessment to the Board of Directors.** The annual assessment may be included in the agenda for Sonoma Water's Board of Directors regular meeting, particularly if a shortage is anticipated or if an existing shortage condition is to be ended.
6. **Submit annual assessment to DWR.** Sonoma Water will submit the annual assessment report to DWR by July 1 of each year.

Table 1. Annual Assessment Timeline												
Task	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Develop draft assessment												
Submit draft annual assessment to the customers												
Receive review comments												
Submit final annual assessment to the TAC and WAC												
Present annual assessment to the Board of Directors												
Submit annual assessment to DWR												

Data and Methodologies

This section presents the key data inputs and assessment methodology that will be used to evaluate Sonoma Water's water supply. The evaluation criteria, water supply, unconstrained demand, water supply, planned water use, infrastructure considerations, and other factors are described.

Evaluation Criteria. Evaluation criteria are determined by the supply source conditions and factors that impact the condition of each supply source. The criteria include the key data inputs and the constraints that are imposed on the water supplies.

The key data inputs that are used by Sonoma Water staff to forecast water supply for the remainder of the current year and a subsequent dry year include the items described below.

- **Unconstrained customer demand.** Current and subsequent year unconstrained demand for each of Sonoma Water's wholesale customers considering weather, growth, and other influencing factors.
- **Russian River operations.** Current reservoir releases from Lake Sonoma and Lake Mendocino, including anticipated releases to meet in-stream flow requirements and water demands and based on reservoir curves and forecast informed reservoir operations (FIRO) decision support tools.
- **Hydrology and watershed conditions.** Lake Sonoma and Lake Mendocino cumulative inflows and storage levels, and soil moisture and snowpack.
- **Potter Valley Project inflows.** Lake Pillsbury storage levels and observed and projected project transfers. Decision 1610 contains trigger points at the first of each month from January to June to establish a hydrologic index based on cumulative inflows into Lake Pillsbury on the Eel River.

Sonoma Water's Russian River water supply is controlled and influenced by a variety of agreements and decisions. There are several constraints, requirements, and restrictions on water supply that will be considered as part of the assessment of the available water supplies, as follows.

- **Lake Sonoma storage level.** Minimum 100,000 ac-ft Lake Sonoma storage level and 30 percent delivery deficiency. This key constraint is described later in this section.

- **Lake Mendocino storage level.** Having a sufficient supply of water in Lake Mendocino in the fall is of critical importance to the salmonid species in the Russian River.
- **Minimum instream flow requirements.** The minimum instream flow schedule varies based on the hydrologic classifications of *Normal*, *Dry*, and *Critical* water supply conditions as defined in Decision 1610. Minimum instream flow requirements for the Russian River and Dry Creek are met by releases from Coyote Valley Dam and Warm Springs Dam.
- **Maximum flow releases from Warm Springs and Coyote Valley Dams.**
- **US Army Corps of Engineers' flood control operations criteria.**
- **The Russian River Biological Opinion.** The Russian River Biological Opinion places certain terms and conditions on the Sonoma Water with respect to its water supply operations.

Sonoma Water's water rights permits include a provision that requires Sonoma Water to impose a 30 percent deficiency in deliveries from the Russian River to its service area when Lake Sonoma storage levels drop below 100,000 ac-ft before July 15 of any year. This deficiency must remain in effect until "(1) storage in Lake Sonoma rises to greater than 70,000 ac-ft subsequent to December 31 after having fallen below that level, or (2) permittee has projected, to the satisfaction of the Chief, Division of Water Rights, that storage at Lake Sonoma will not fall below 70,000 ac-ft, or (3) hydrologic conditions result in sufficient flow to satisfy permittee's demands at Wohler and Mirabel Park and minimum flow requirements in the Russian River at Guerneville."

Water Supply. This subsection provides a brief overview of Sonoma Water's supply sources. These water supply sources will be described, and estimates made of the availability of supplies in the annual assessment. Sonoma Water's most recent Urban Water Management Plan provides a more detailed description of the water supplies.

The Russian River provides most of Sonoma Water's water supply with groundwater supply from the Santa Rosa Plain as a secondary source. Sonoma Water diverts water from the Russian River near Forestville and conveys the water via its transmission system to its customers. The surface water is subject to varying quantities of available supply based on hydrologic conditions and sometimes regulatory restrictions.

Almost all of Sonoma Water's customers have other water supplies, in addition to those provided by Sonoma Water, which include local surface water, local groundwater, and recycled water. These local supplies will not be included in the assessment. Each customer will develop its own assessment of their available supplies.

Two federal projects impound water in the Russian River watershed: the Coyote Valley Dam on the Russian River east of the City of Ukiah in Mendocino County (forming Lake Mendocino), and the Warm Springs Dam on Dry Creek (a tributary of the Russian River). The Potter Valley Project diverts water from the Eel River into the Russian River watershed.

Unconstrained Customer Demand. The assessment will present the current year unconstrained demands from Sonoma Water's customers, considering weather, growth, and other influencing factors. The unconstrained water demands will be provided by the customers.

Planned Water Use for Current Year Considering Dry Subsequent Year. The assessment will present an evaluation of the amount of anticipated water supplies for the current year as well as how the supplies will be used, while anticipating that the following year will be dry.

The annual assessment will be based on evaluating the key data inputs to determine the water supply reliability. The methodology to develop the annual assessment will follow the general approach described below.

1. **Quantify current year water supply.** The available water supply from all water supply sources will be estimated for the current year based on the data inputs, evaluation criteria, and hydrological and regulatory conditions in the current year. Sonoma Water staff will evaluate water supply conditions beginning at least mid-month prior to each of the January to June Decision 1610 trigger dates to determine whether anticipated conditions at the trigger dates warrant any actions by Sonoma Water. The projections of the water supply will be expressed as a range and based on the results of operations modeling of the Russian River system consisting of the statistical evaluation of multiple scenarios. The model is described later in this subsection. Figure 1 presents the key considerations for the assessment of Russian River supply conditions.
2. **Quantify subsequent year supply.** The subsequent year water supplies will be estimated by assuming a dry year. Sonoma Water may base the estimate of dry year water supplies on the historical hydrologic record or some other approach.
3. **Identify infrastructure constraints.** The existing infrastructure capabilities and plausible constraints as they impact Sonoma Water's ability to deliver supplies to meet expected customer water use needs in the coming year will be considered.
4. **Quantify unconstrained water demand.** The unconstrained water demands for all the customers will be provided by the customers.
5. **Compare projected water supplies to demands.** The water supplies identified in the annual assessment will represent the water demand that can be met while maintaining adequate storage in Lakes Mendocino and Sonoma.
6. **Identify and quantify anticipated water supply shortages, if any.** The forecast of water supplies in comparison to water demands will identify and quantify any anticipated water shortages. The forecast will be coordinated with the customers. Depending on the extent of the forecast shortage, the appropriate shortage stage will be selected. If the forecast is for a wet season, there would be no concerns. If the season was dry in the early wet season, there would be a potential concern and river flows and reservoir levels would be monitored more closely. Depending on the extent of precipitation in the latter portion of the wet season, the forecast could be changed to no concern or to an anticipated shortage.
7. **Extent of water shortage.** The water shortage may be caused by the requirement to reduce supplies by 30 percent based on the Lake Sonoma level. Sonoma Water may request voluntary reductions and perhaps mandatory reductions before Lake Sonoma levels reached 100,000 ac-ft by July 15in accordance with the applicable provisions of the Restructured Agreement and consistent with the defined shortage stages . If a shortage is identified, the water shortage allocation methodology will be used to allocate the reduced supply to each customer. Each of Sonoma Water's customers will develop their own annual assessments that will include estimates of their projected quantity of local water supplies.

The forecast of the amount of available water supplies will be developed by Sonoma Water using the Russian River System Model (RR ResSim). The model is used as a planning tool to simulate the effects of various climatic conditions, levels of demand, and operational criteria on the water supply available for use by Sonoma Water and others.

Infrastructure Considerations. The annual assessment will include an evaluation of how infrastructure capabilities and constraints may affect Sonoma Water's ability to deliver supplies to meet expected customer water use needs in the current year.

Other Factors. The annual assessment will describe any other locally applicable factors that could influence the amount of available water supplies.

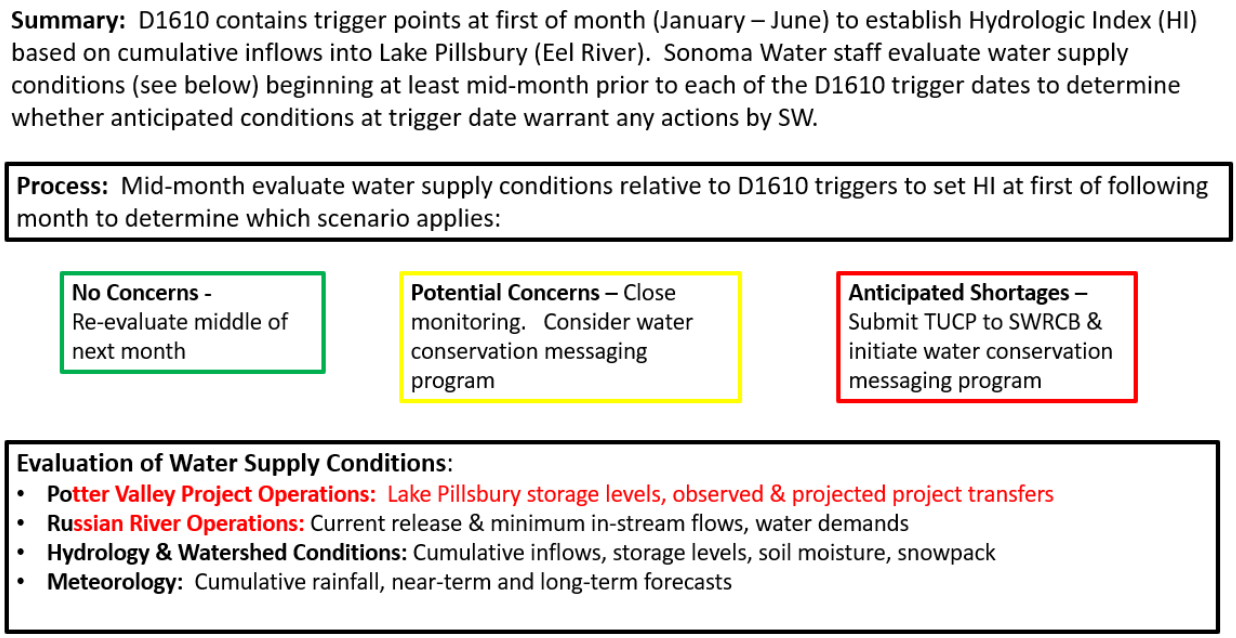


Figure 1. Assessment of Russian River Water Supply Conditions

NORTH MARIN WATER DISTRICT

ATTACHMENT 2

DROUGHT RESPONSE TOOL QUANTITATIVE ASSESSMENT

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

Enter Agency Information		
Agency Name	North Marin Water District	
Total Population Served	61,658	
Conservation Goal (%)	5%	
Drought Stage	Stage 1	
Number of Residential Accounts	18,699	
Number of Commercial, Industrial, and Institutional (CII) Accounts	909	
Number of Dedicated Irrigation Accounts	356	
Baseline Year(s)	2019	FY
Percentage of Residential Indoor Use During Minimum Month (%)	100%	
Percentage of CII Indoor Use During Minimum Month (%)	100%	
Comments		

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

6 - DROUGHT RESPONSE TRACKING	**Track production and water savings against the conservation target.**

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100

2 - Input Baseline Year (2019) Water Use

North Marin Water District

Input Baseline Year (2019) Production and Water Use

Units: (af)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (af)	Residential Water Use (af)	CII Water Use (af)	Dedicated Irrigation Water Use (af)	Non-Revenue Water Use (af)	Total R-GPCD	Comments
July	1,084	686	186	157	55	117	NRW is assumed to be 4%.
August	762	567	101	60	34	97	Water use is reported on a fiscal-year basis.
September	1,213	789	171	189	64	139	
October	789	591	100	59	40	101	
November	780	538	99	100	42	95	
December	551	423	74	29	25	72	
January	535	403	73	31	27	69	
February	348	274	54	4	16	52	
March	431	326	69	14	21	56	
April	298	232	50	3	13	41	
May	561	354	153	27	28	60	
June	565	429	83	27	27	76	

3 - Baseline Year (2019) Water Use Profile

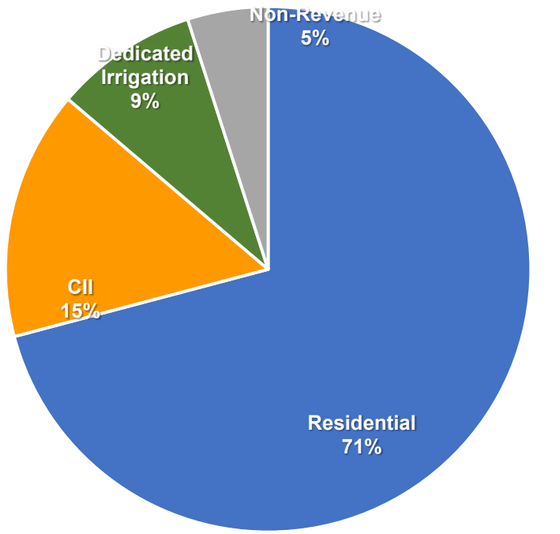
North Marin Water District

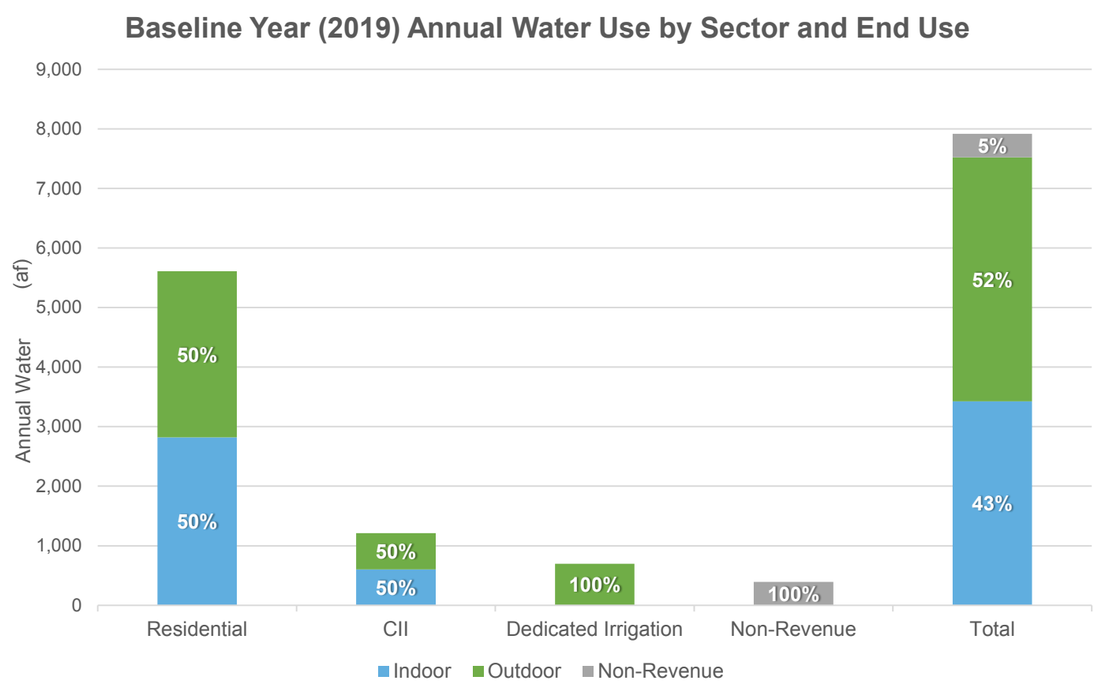
Baseline Year (2019) Annual Water Use Summary

Units: (af)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

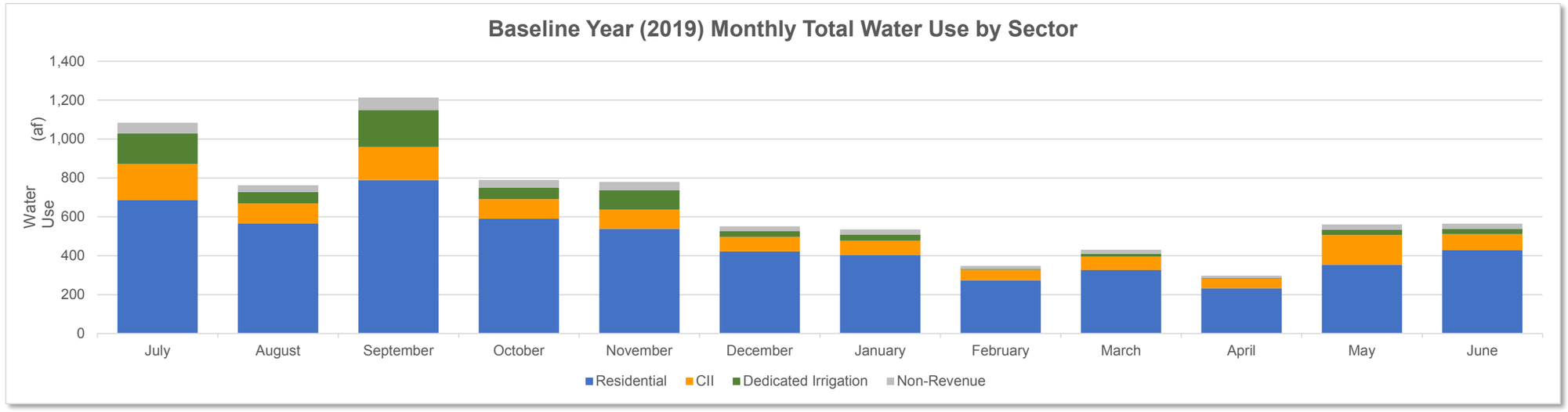
Water Use	Total Production (af)	Water Use (af)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	7,916	5,611	1,214	699	392	
Total Indoor	3,426	2,821	605	--	--	
Total Outdoor	4,097	2,789	609	699	--	
Total Non-Revenue	392	--	--	--	392	
Total Indoor %	43%	50%	50%	0%	--	
Total Outdoor %	52%	50%	50%	100%	--	
Total Non-Revenue %	5%	--	--	--	100%	

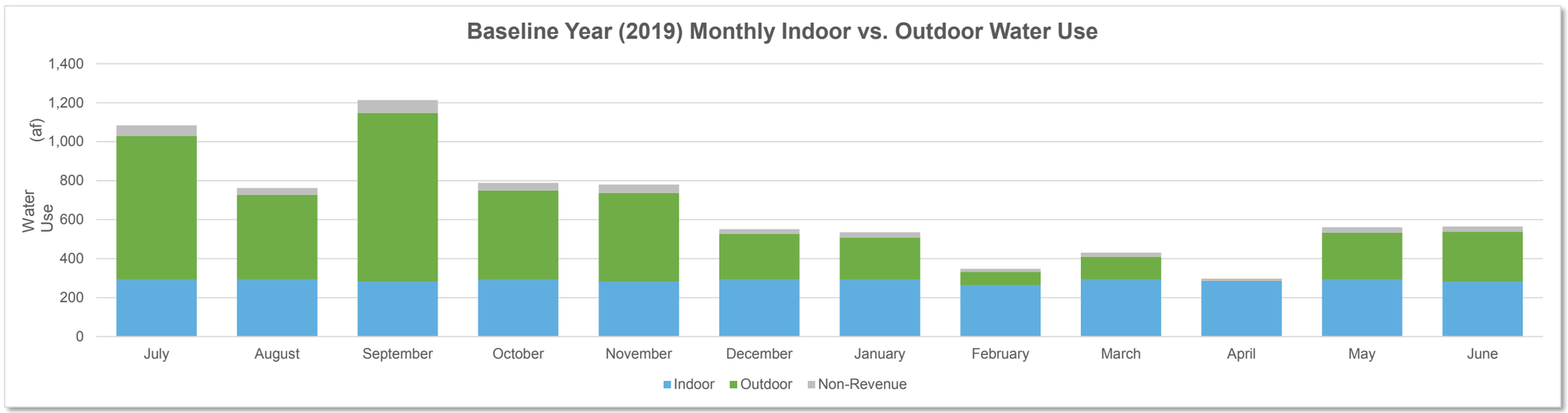




3 - Baseline Year (2019) Water Use Profile

North Marin Water District



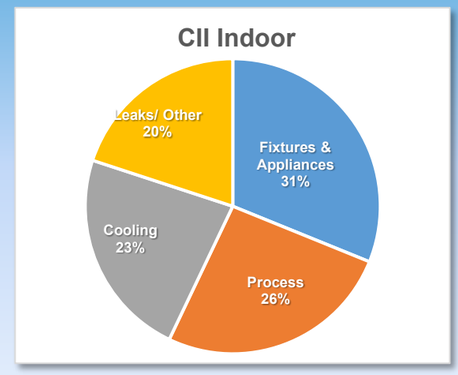


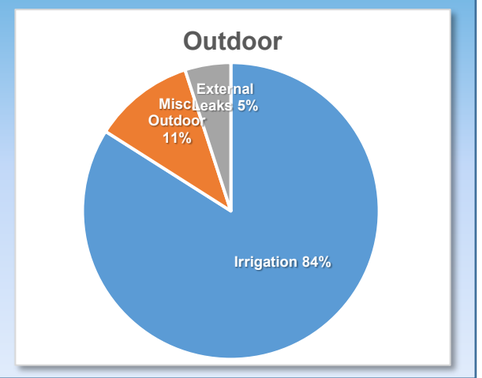
4 - Drought Response Actions - Stage 1

North Marin Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	40	R-GPCD
Maximum Residential Outdoor Savings	75%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	10%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	75%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	75%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	43%	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





4 - Drought Response Actions - Stage 1

North Marin Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**75%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☑	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☑	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☑			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☑			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 1

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	50%	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☐	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%		--	--
Home or Mobile Water Use Reports	All	☐	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☐	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☐	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☐	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

4 - Drought Response Actions - Stage 1

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	**35%**	--	--
Require Pool Covers	Misc. Outdoor	☐	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☐	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☐	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 1

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 1

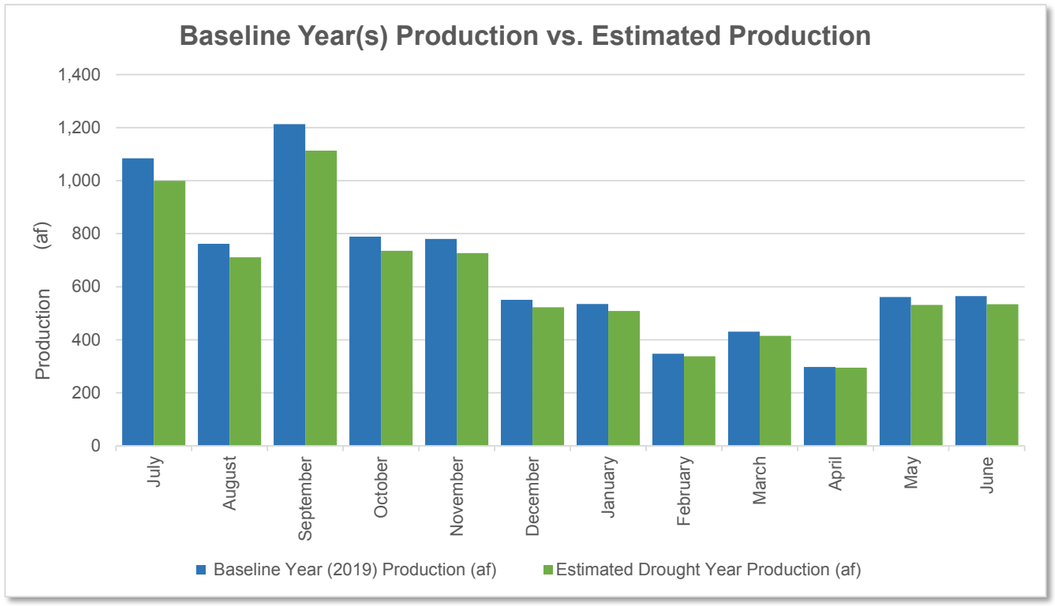
North Marin Water District

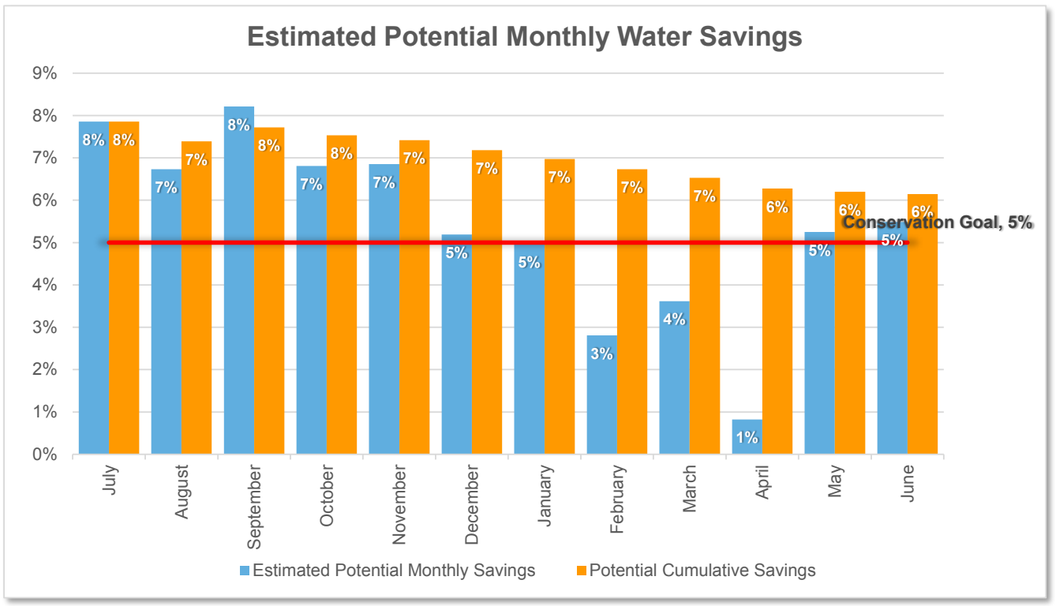
Estimated Monthly Water Use and Savings Summary

Units: (af)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (af)	Estimated Drought Year Production (af)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
July	1,084	999	8%	8%	5%	
August	762	711	7%	7%	5%	
September	1,213	1,113	8%	8%	5%	
October	789	736	7%	8%	5%	
November	780	726	7%	7%	5%	
December	551	522	5%	7%	5%	
January	535	508	5%	7%	5%	
February	348	338	3%	7%	5%	
March	431	415	4%	7%	5%	
April	298	295	1%	6%	5%	
May	561	532	5%	6%	5%	
June	565	534	5%	6%	5%	





Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

Enter Agency Information		
Agency Name	North Marin Water District	
Total Population Served	61,658	
Conservation Goal (%)	15%	
Drought Stage	Stage 2	
Number of Residential Accounts	18,699	
Number of Commercial, Industrial, and Institutional (CII) Accounts	909	
Number of Dedicated Irrigation Accounts	356	
Baseline Year(s)	2019	FY
Percentage of Residential Indoor Use During Minimum Month (%)	100%	
Percentage of CII Indoor Use During Minimum Month (%)	100%	
Comments		

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

6 - DROUGHT RESPONSE TRACKING	**Track production and water savings against the conservation target.**

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100

2 - Input Baseline Year (2019) Water Use

North Marin Water District

Input Baseline Year (2019) Production and Water Use

Units: (af)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (af)	Residential Water Use (af)	CII Water Use (af)	Dedicated Irrigation Water Use (af)	Non-Revenue Water Use (af)	Total R-GPCD	Comments
July	1,084	686	186	157	55	117	NRW is assumed to be 4%.
August	762	567	101	60	34	97	Water use is reported on a fiscal-year basis.
September	1,213	789	171	189	64	139	
October	789	591	100	59	40	101	
November	780	538	99	100	42	95	
December	551	423	74	29	25	72	
January	535	403	73	31	27	69	
February	348	274	54	4	16	52	
March	431	326	69	14	21	56	
April	298	232	50	3	13	41	
May	561	354	153	27	28	60	
June	565	429	83	27	27	76	

3 - Baseline Year (2019) Water Use Profile

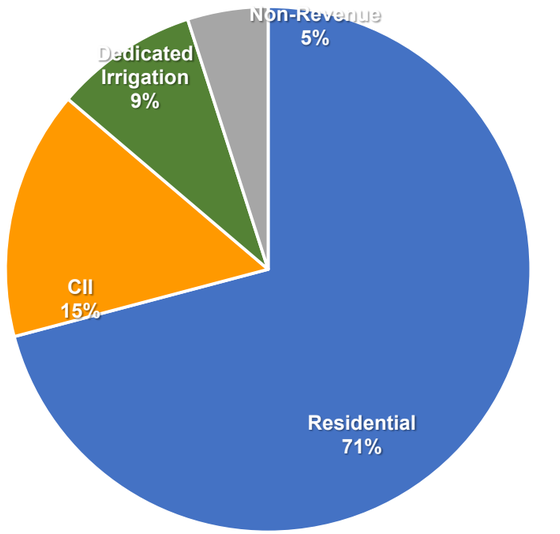
North Marin Water District

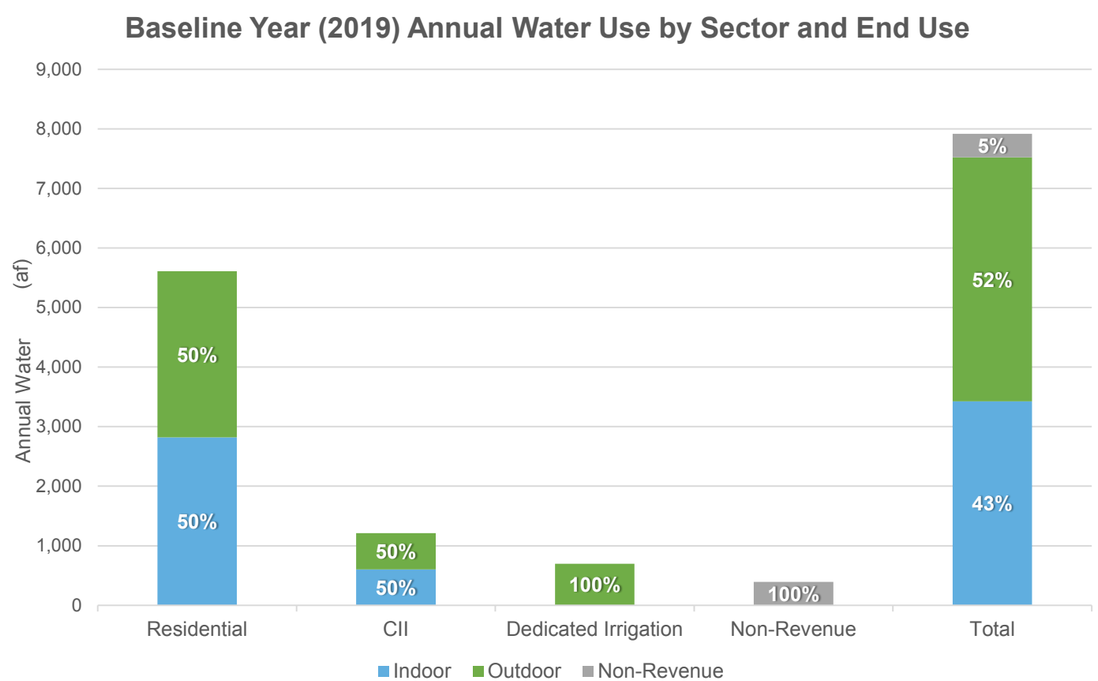
Baseline Year (2019) Annual Water Use Summary

Units: (af)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

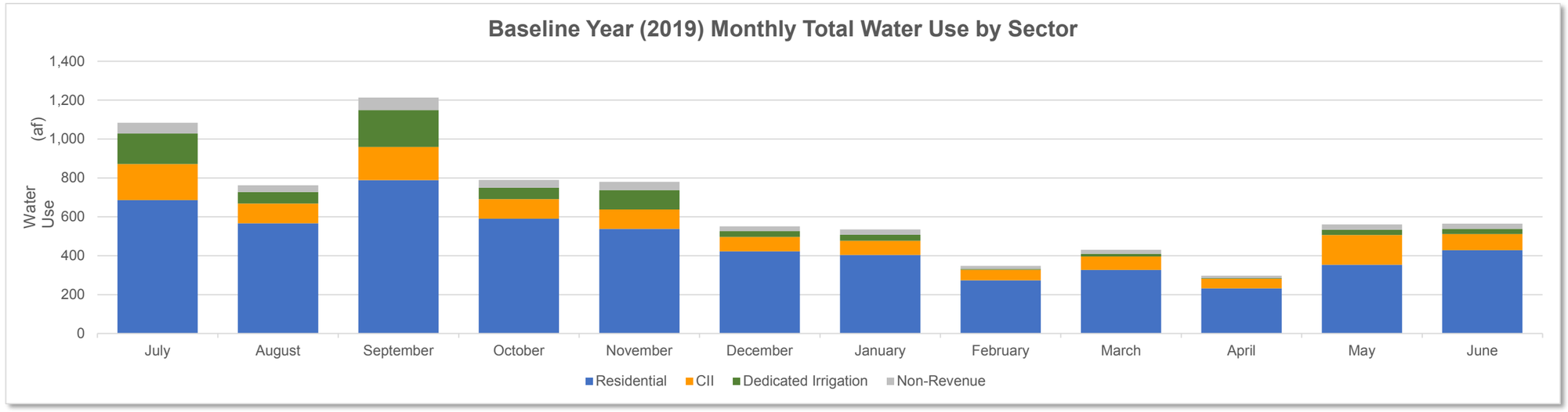
Water Use	Total Production (af)	Water Use (af)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	7,916	5,611	1,214	699	392	
Total Indoor	3,426	2,821	605	--	--	
Total Outdoor	4,097	2,789	609	699	--	
Total Non-Revenue	392	--	--	--	392	
Total Indoor %	43%	50%	50%	0%	--	
Total Outdoor %	52%	50%	50%	100%	--	
Total Non-Revenue %	5%	--	--	--	100%	

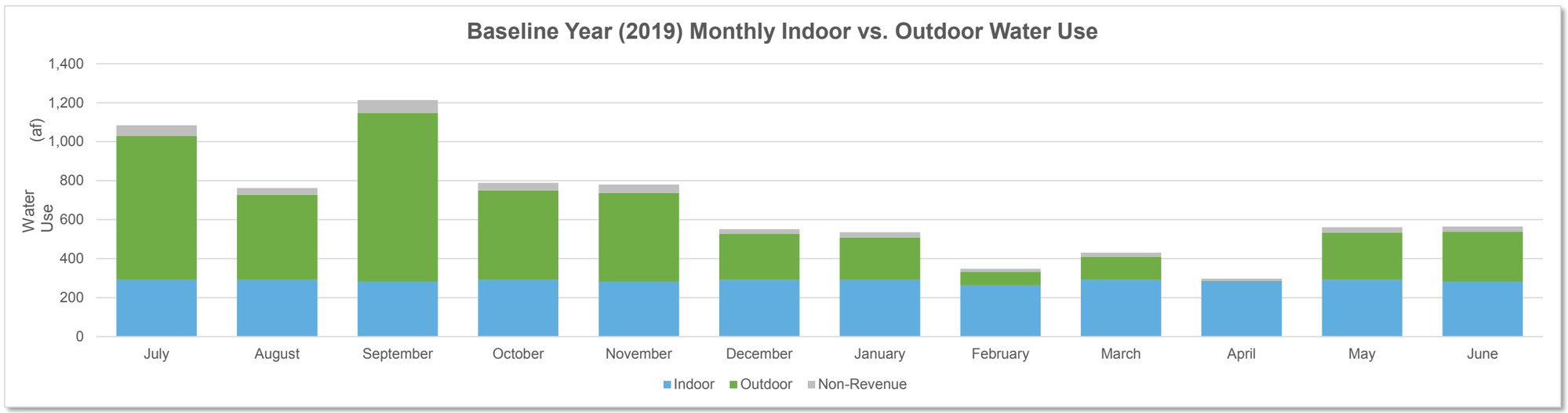




3 - Baseline Year (2019) Water Use Profile

North Marin Water District



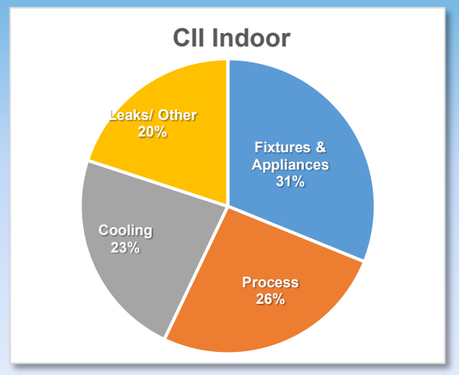


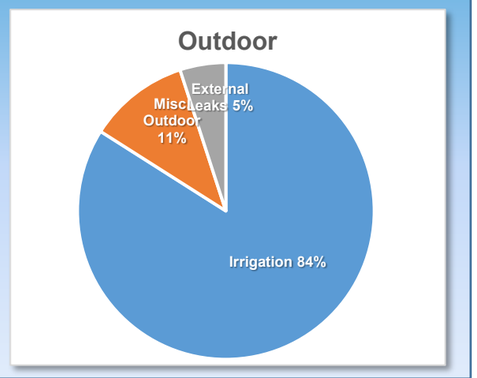
4 - Drought Response Actions - Stage 2

North Marin Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	40	R-GPCD
Maximum Residential Outdoor Savings	75%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	10%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	75%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	75%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	43%	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





4 - Drought Response Actions - Stage 2

North Marin Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**75%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☑	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☑	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☑			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☑			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 2

North Marin Water District

Drought Response Actions						
Action Description	**End Use(s)**	**Implement Program**	**End Use Savings (%)**	**Implementation Rate**	**Source of Default Savings Estimate**	**Source of Default Implementation Rate**
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	**1.0%**	**75%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	**1.0%**	**75%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	**1.0%**	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%		--	--
Home or Mobile Water Use Reports	All	☐	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☐	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☐	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 3 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☑	**17%**	**85%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

4 - Drought Response Actions - Stage 2

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 3 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☑	**17%**	**85%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	**35%**	--	--
Require Pool Covers	Misc. Outdoor	☐	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☐	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 3 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☑	**17%**	**80%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☑		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☐	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 2

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 2

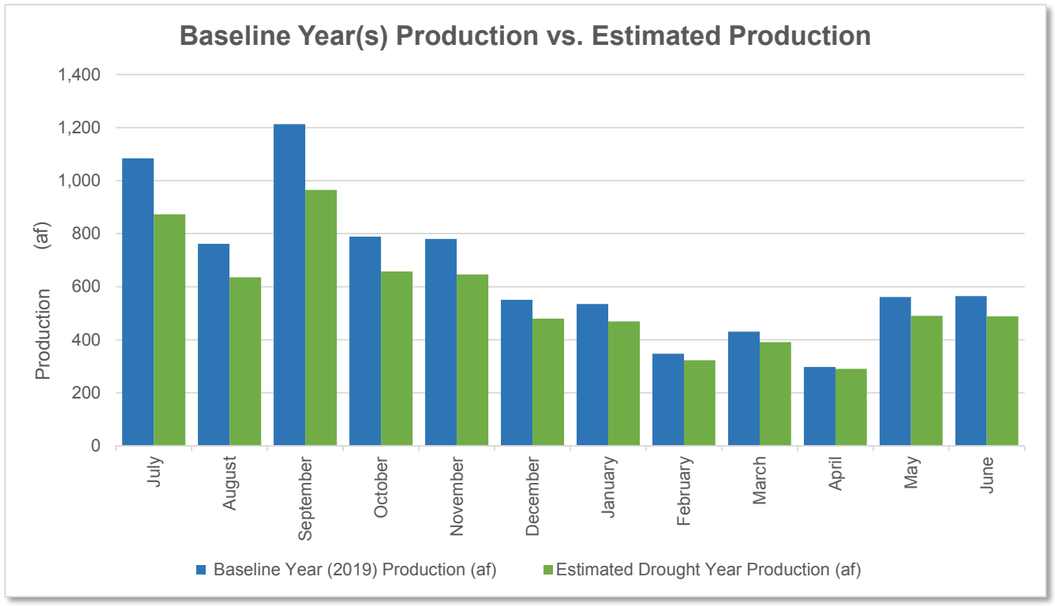
North Marin Water District

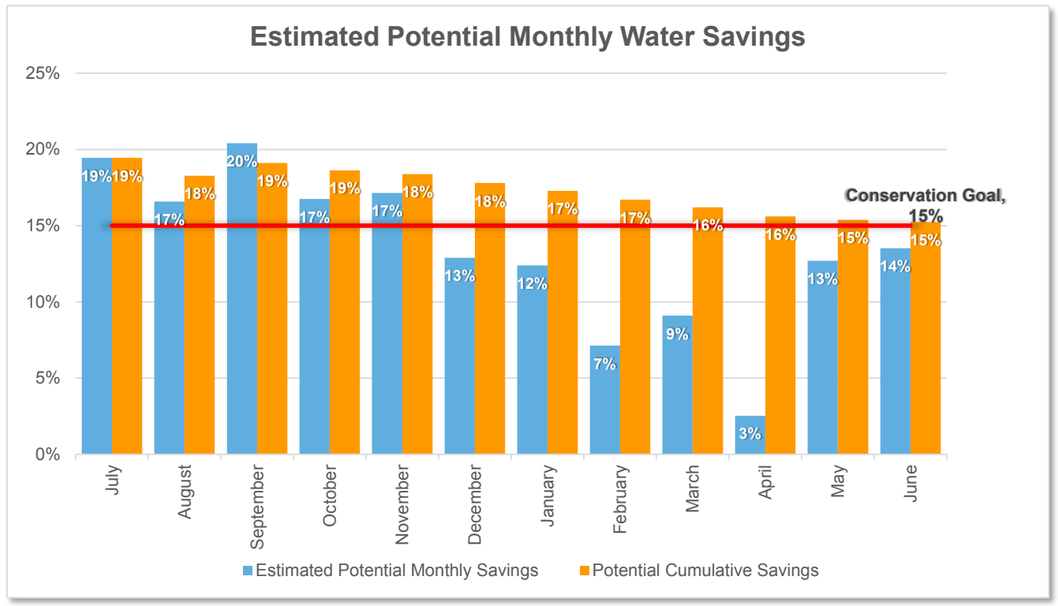
Estimated Monthly Water Use and Savings Summary

Units: (af)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (af)	Estimated Drought Year Production (af)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
July	1,084	873	19%	19%	15%	
August	762	636	17%	18%	15%	
September	1,213	965	20%	19%	15%	
October	789	657	17%	19%	15%	
November	780	646	17%	18%	15%	
December	551	480	13%	18%	15%	
January	535	469	12%	17%	15%	
February	348	323	7%	17%	15%	
March	431	392	9%	16%	15%	
April	298	290	3%	16%	15%	
May	561	490	13%	15%	15%	
June	565	488	14%	15%	15%	





Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

Enter Agency Information		
Agency Name	North Marin Water District	
Total Population Served	61,658	
Conservation Goal (%)	25%	
Drought Stage	Stage 3	
Number of Residential Accounts	18,699	
Number of Commercial, Industrial, and Institutional (CII) Accounts	909	
Number of Dedicated Irrigation Accounts	356	
Baseline Year(s)	2019	FY
Percentage of Residential Indoor Use During Minimum Month (%)	100%	
Percentage of CII Indoor Use During Minimum Month (%)	100%	
Comments		

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

6 - DROUGHT RESPONSE TRACKING	**Track production and water savings against the conservation target.**

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100

2 - Input Baseline Year (2019) Water Use

North Marin Water District

Input Baseline Year (2019) Production and Water Use

Units: (af)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (af)	Residential Water Use (af)	CII Water Use (af)	Dedicated Irrigation Water Use (af)	Non-Revenue Water Use (af)	Total R-GPCD	Comments
July	1,084	686	186	157	55	117	NRW is assumed to be 4%.
August	762	567	101	60	34	97	Water use is reported on a fiscal-year basis.
September	1,213	789	171	189	64	139	
October	789	591	100	59	40	101	
November	780	538	99	100	42	95	
December	551	423	74	29	25	72	
January	535	403	73	31	27	69	
February	348	274	54	4	16	52	
March	431	326	69	14	21	56	
April	298	232	50	3	13	41	
May	561	354	153	27	28	60	
June	565	429	83	27	27	76	

3 - Baseline Year (2019) Water Use Profile

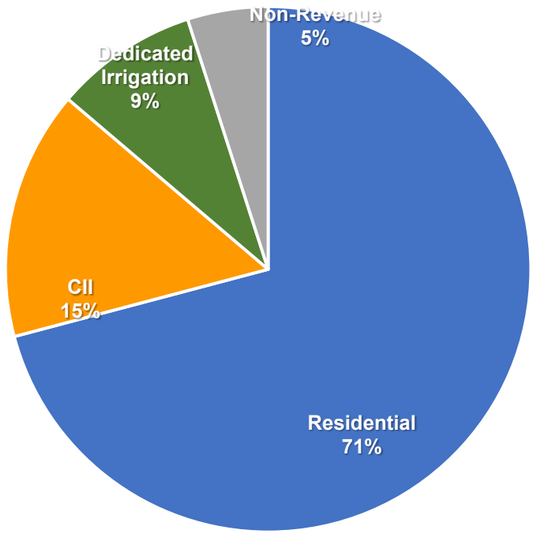
North Marin Water District

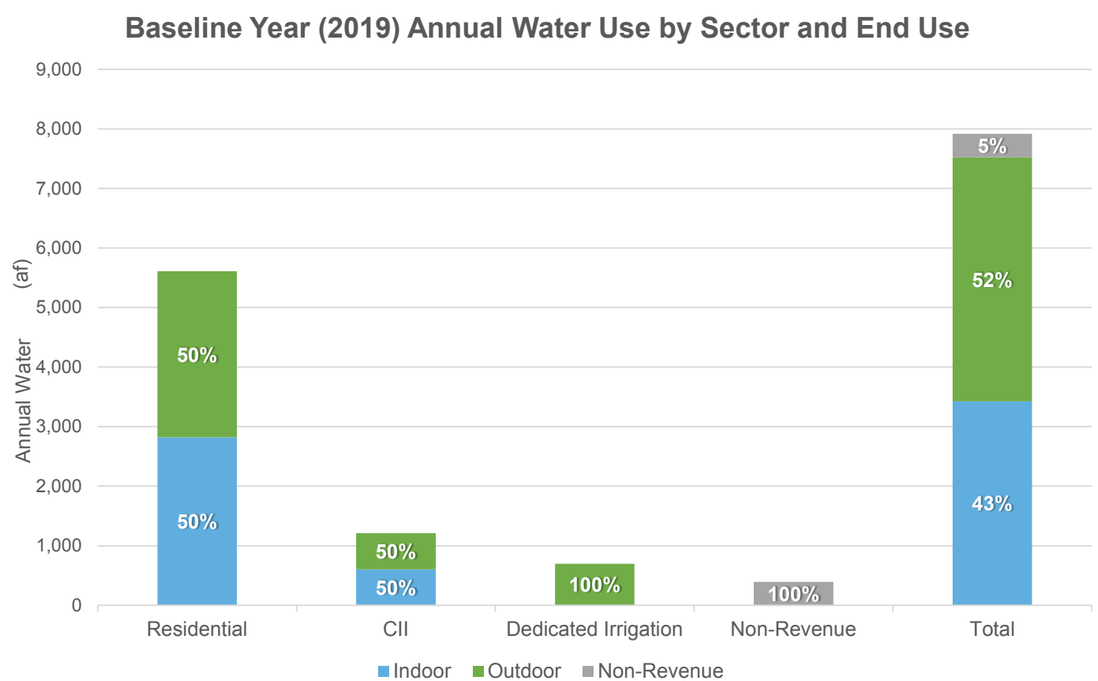
Baseline Year (2019) Annual Water Use Summary

Units: (af)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

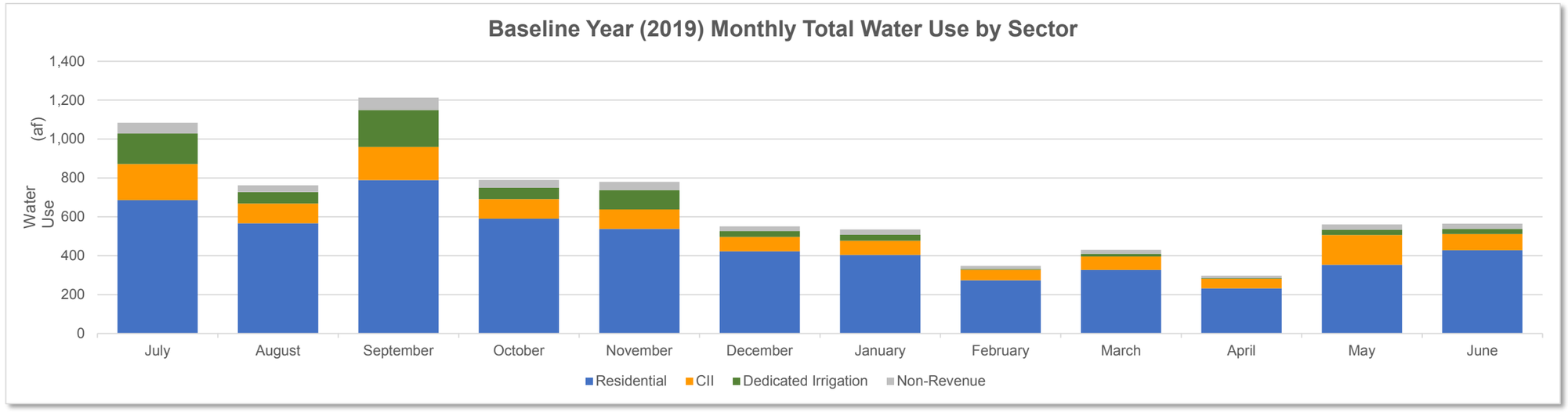
Water Use	Total Production (af)	Water Use (af)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	7,916	5,611	1,214	699	392	
Total Indoor	3,426	2,821	605	--	--	
Total Outdoor	4,097	2,789	609	699	--	
Total Non-Revenue	392	--	--	--	392	
Total Indoor %	43%	50%	50%	0%	--	
Total Outdoor %	52%	50%	50%	100%	--	
Total Non-Revenue %	5%	--	--	--	100%	

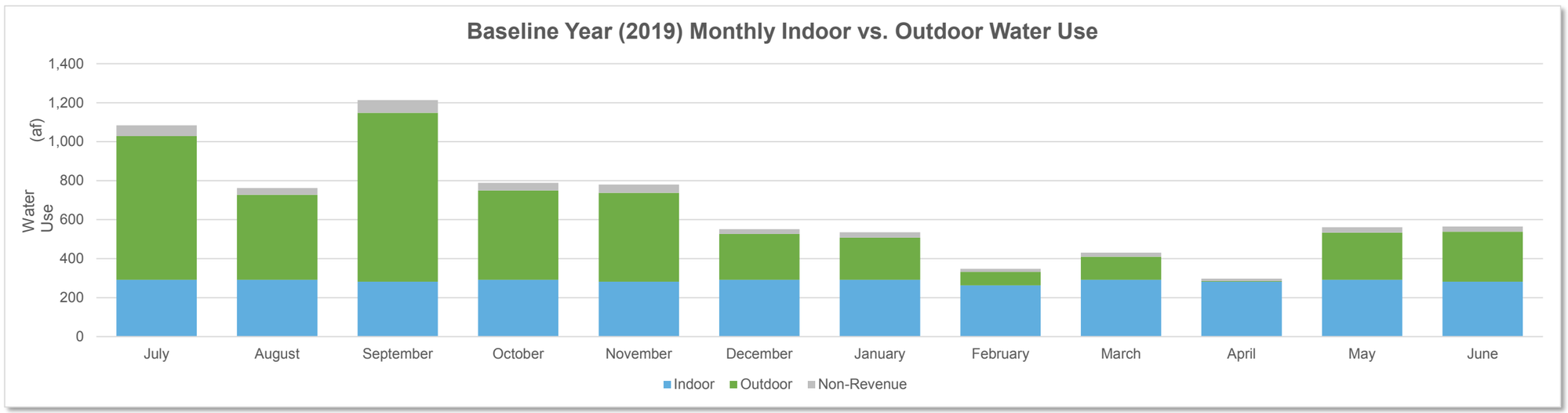




3 - Baseline Year (2019) Water Use Profile

North Marin Water District



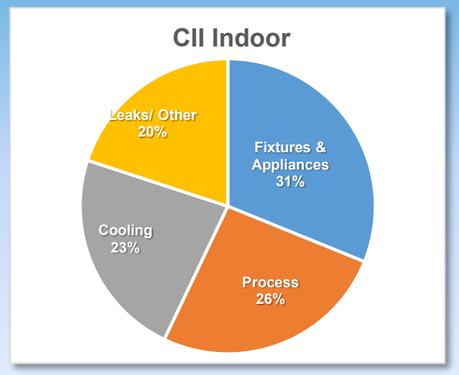


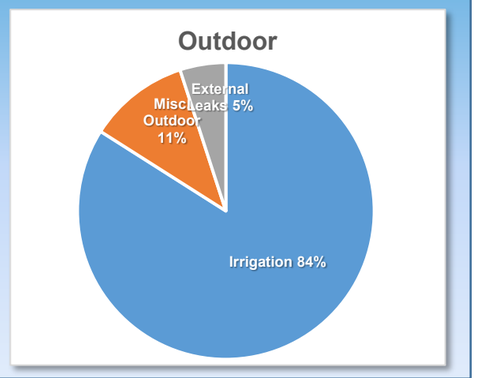
4 - Drought Response Actions - Stage 3

North Marin Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	75%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	50%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	75%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	75%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**59%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





4 - Drought Response Actions - Stage 3

North Marin Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**75%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☑	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☑	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☑			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☑			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 3

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	50%	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%		--	--
Home or Mobile Water Use Reports	All	☐	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☐	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☐	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☑	**38%**	**80%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

4 - Drought Response Actions - Stage 3

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☑	**38%**	**80%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	**35%**	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☑	**38%**	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☑		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☐	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 3

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 3

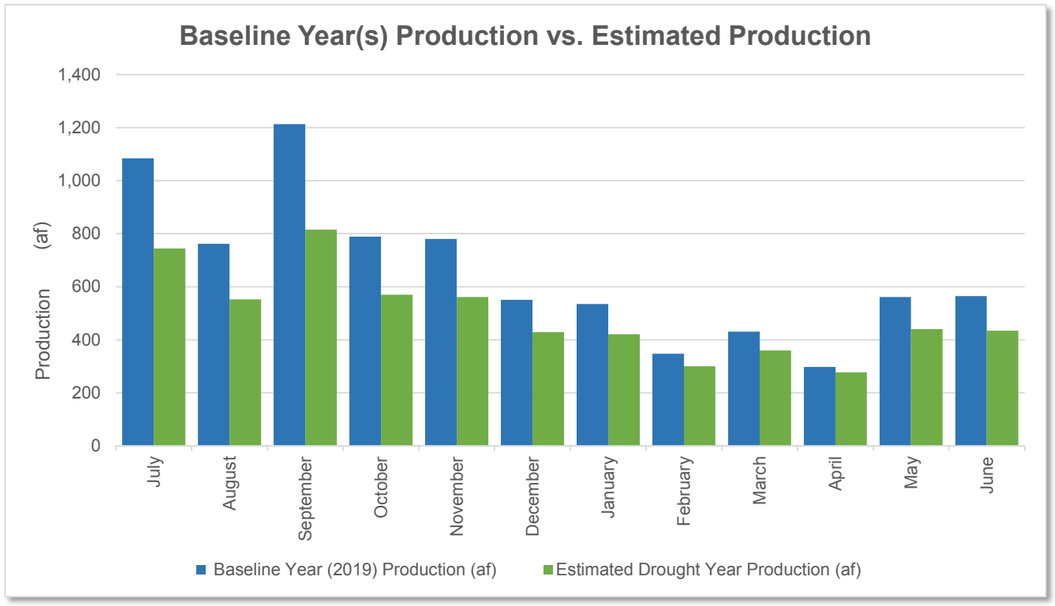
North Marin Water District

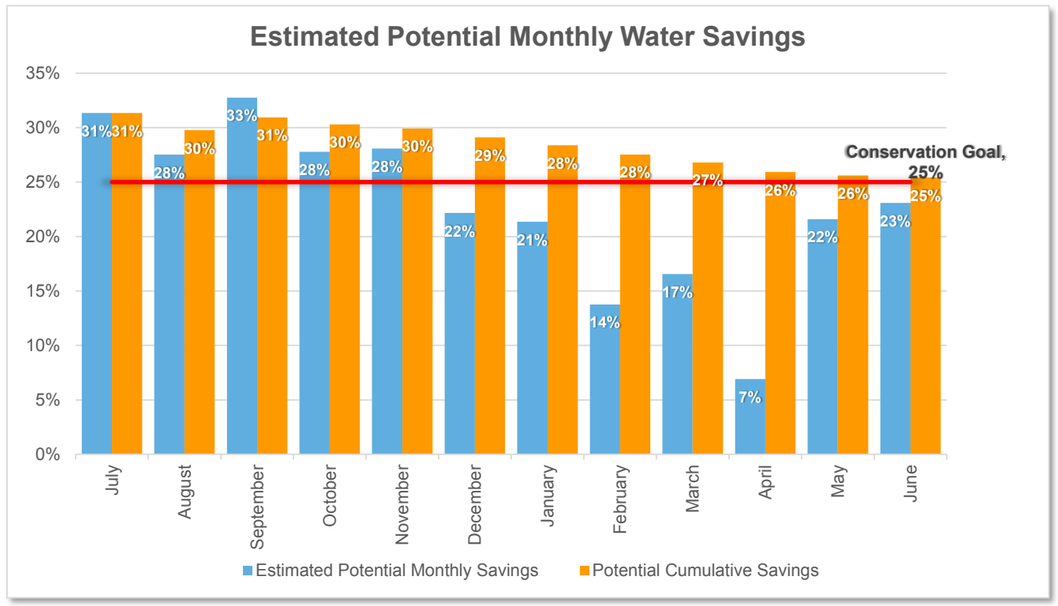
Estimated Monthly Water Use and Savings Summary

Units: (af)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (af)	Estimated Drought Year Production (af)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
July	1,084	744	31%	31%	25%	
August	762	552	28%	30%	25%	
September	1,213	816	33%	31%	25%	
October	789	570	28%	30%	25%	
November	780	561	28%	30%	25%	
December	551	429	22%	29%	25%	
January	535	421	21%	28%	25%	
February	348	300	14%	28%	25%	
March	431	359	17%	27%	25%	
April	298	277	7%	26%	25%	
May	561	440	22%	26%	25%	
June	565	434	23%	25%	25%	





Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

Enter Agency Information		
Agency Name	North Marin Water District	
Total Population Served	61,658	
Conservation Goal (%)	35%	
Drought Stage	Stage 4	
Number of Residential Accounts	18,699	
Number of Commercial, Industrial, and Institutional (CII) Accounts	909	
Number of Dedicated Irrigation Accounts	356	
Baseline Year(s)	2019	FY
Percentage of Residential Indoor Use During Minimum Month (%)	100%	
Percentage of CII Indoor Use During Minimum Month (%)	100%	
Comments		

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

6 - DROUGHT RESPONSE TRACKING	**Track production and water savings against the conservation target.**

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100

2 - Input Baseline Year (2019) Water Use

North Marin Water District

Input Baseline Year (2019) Production and Water Use

Units: (af)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (af)	Residential Water Use (af)	CII Water Use (af)	Dedicated Irrigation Water Use (af)	Non-Revenue Water Use (af)	Total R-GPCD	Comments
July	1,084	686	186	157	55	117	NRW is assumed to be 4%.
August	762	567	101	60	34	97	Water use is reported on a fiscal-year basis.
September	1,213	789	171	189	64	139	
October	789	591	100	59	40	101	
November	780	538	99	100	42	95	
December	551	423	74	29	25	72	
January	535	403	73	31	27	69	
February	348	274	54	4	16	52	
March	431	326	69	14	21	56	
April	298	232	50	3	13	41	
May	561	354	153	27	28	60	
June	565	429	83	27	27	76	

3 - Baseline Year (2019) Water Use Profile

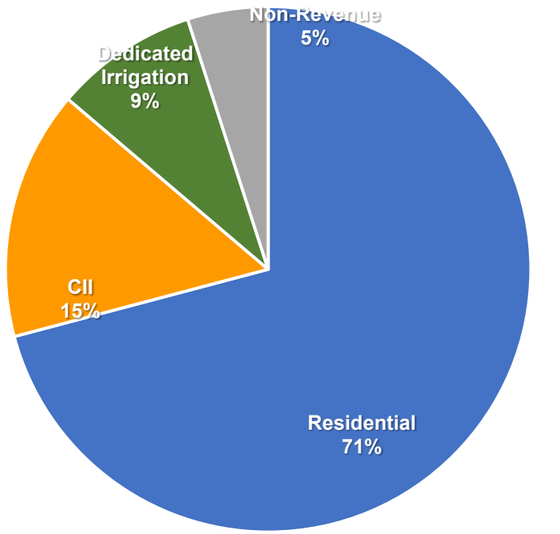
North Marin Water District

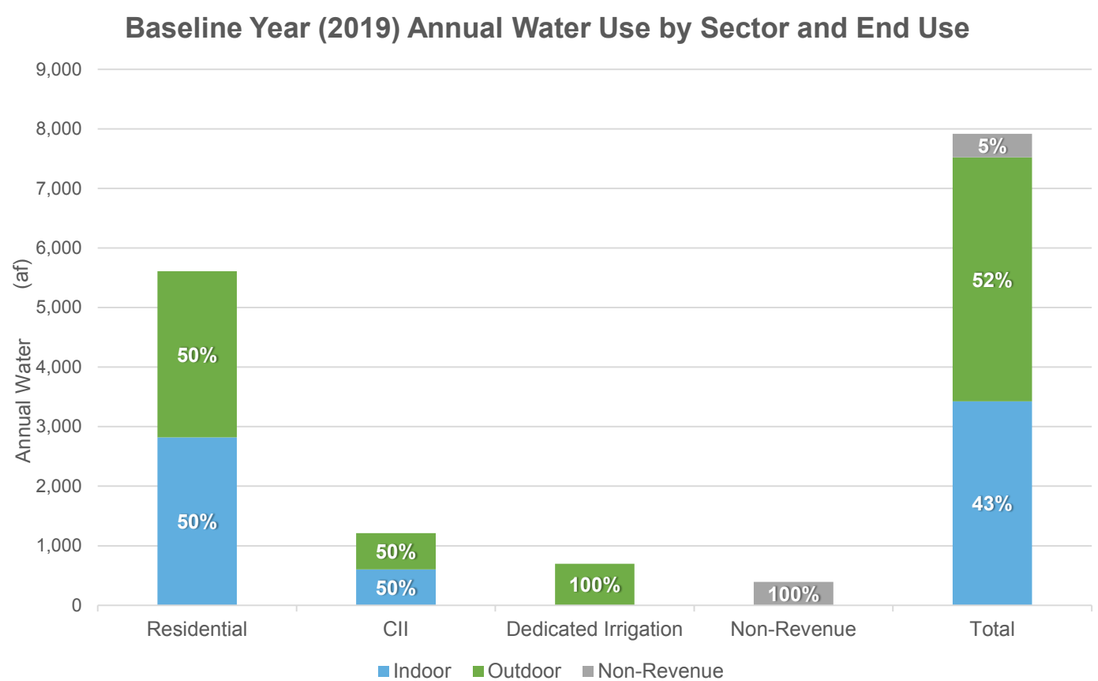
Baseline Year (2019) Annual Water Use Summary

Units: (af)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

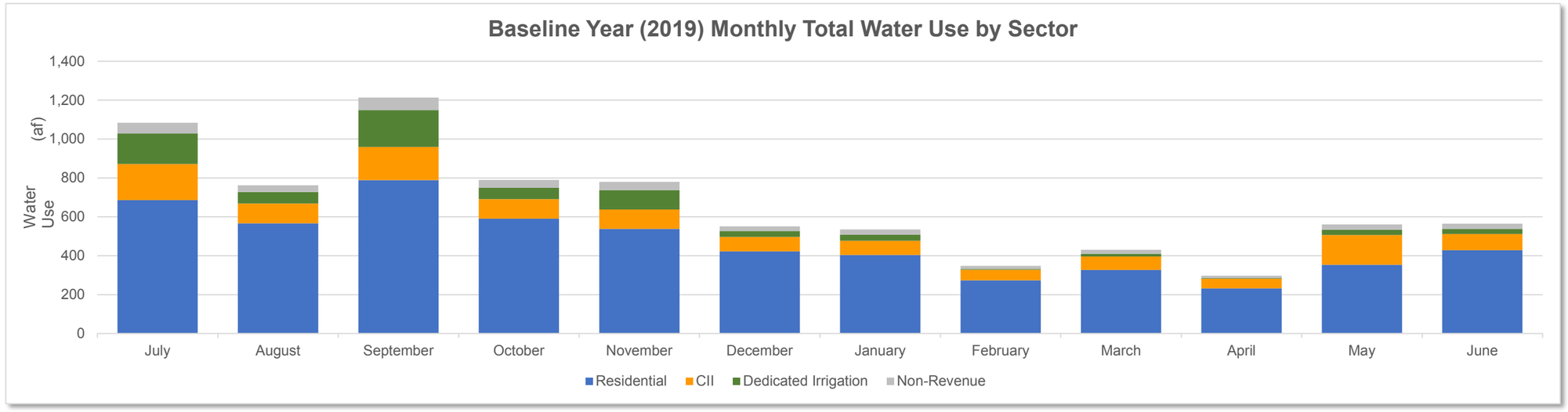
Water Use	Total Production (af)	Water Use (af)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	7,916	5,611	1,214	699	392	
Total Indoor	3,426	2,821	605	--	--	
Total Outdoor	4,097	2,789	609	699	--	
Total Non-Revenue	392	--	--	--	392	
Total Indoor %	43%	50%	50%	0%	--	
Total Outdoor %	52%	50%	50%	100%	--	
Total Non-Revenue %	5%	--	--	--	100%	

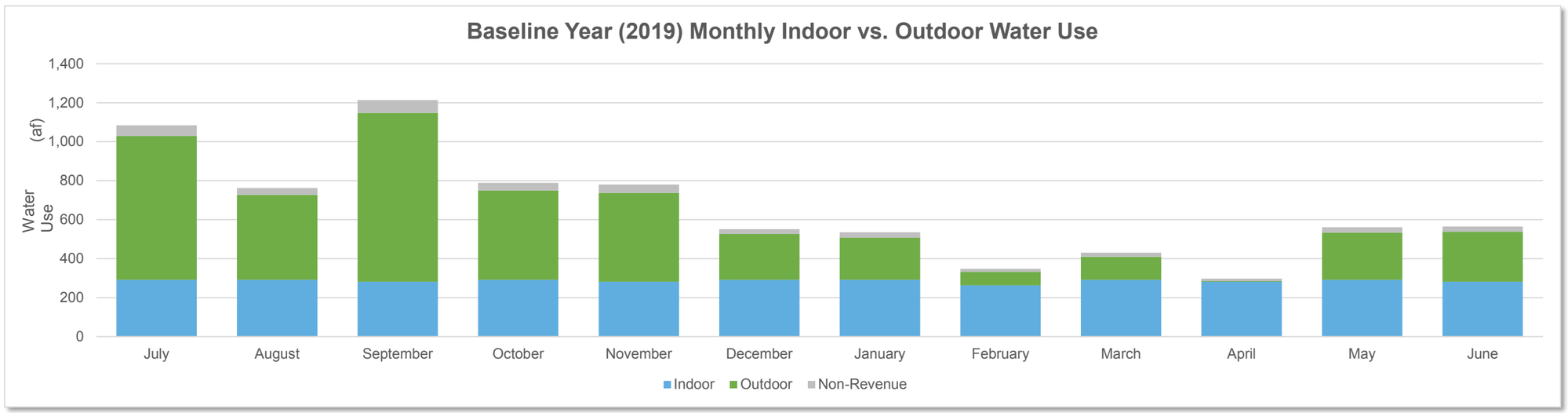




3 - Baseline Year (2019) Water Use Profile

North Marin Water District



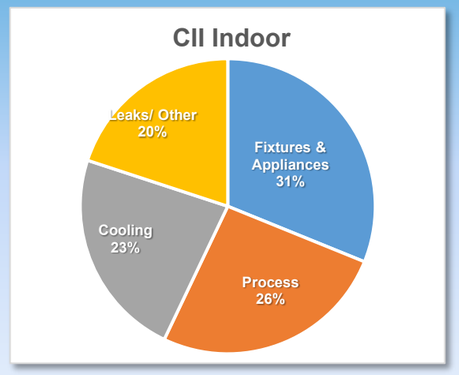


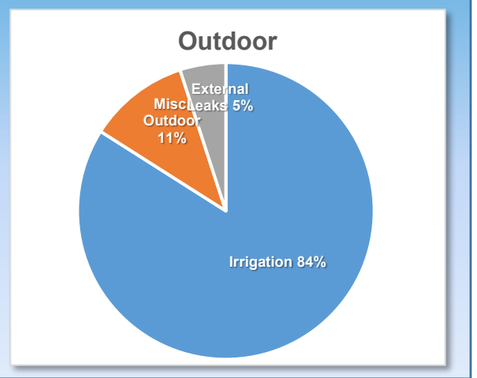
4 - Drought Response Actions - Stage 4

North Marin Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	75%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	50%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	75%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	75%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**59%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





4 - Drought Response Actions - Stage 4

North Marin Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**75%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☑	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☑	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☑			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☑			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 4

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	**1.5%**	**80%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	**1.5%**	**80%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	**1.5%**	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%		--	--
Home or Mobile Water Use Reports	All	☐	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☐	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☐	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	38%	80%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☑	79%	**60%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

4 - Drought Response Actions - Stage 4

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	38%	80%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☑	79%	**60%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	**35%**	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	38%	80%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☑	79%	**60%**		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☑		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 4

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 4

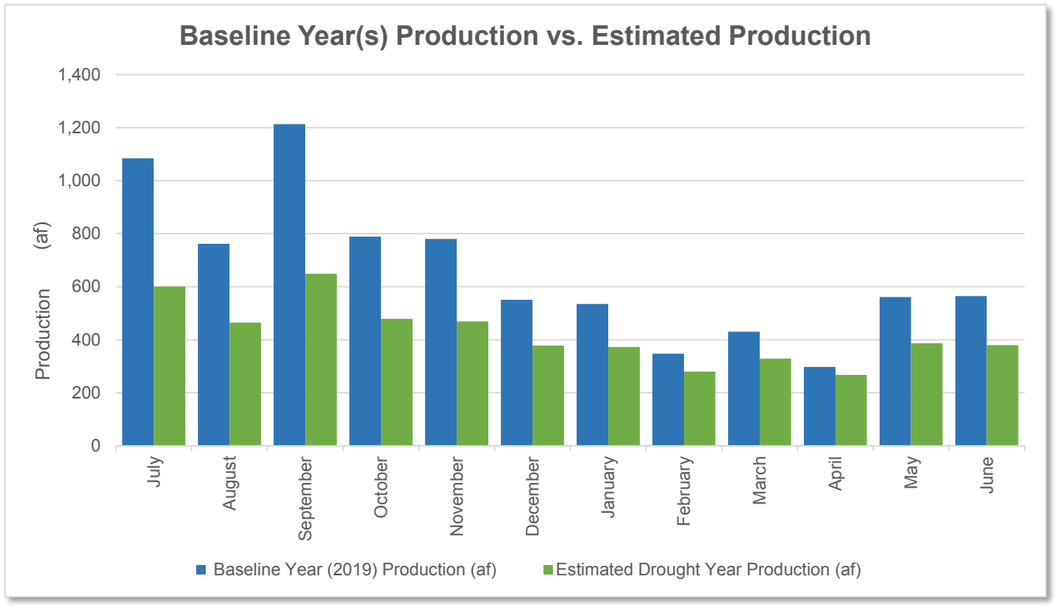
North Marin Water District

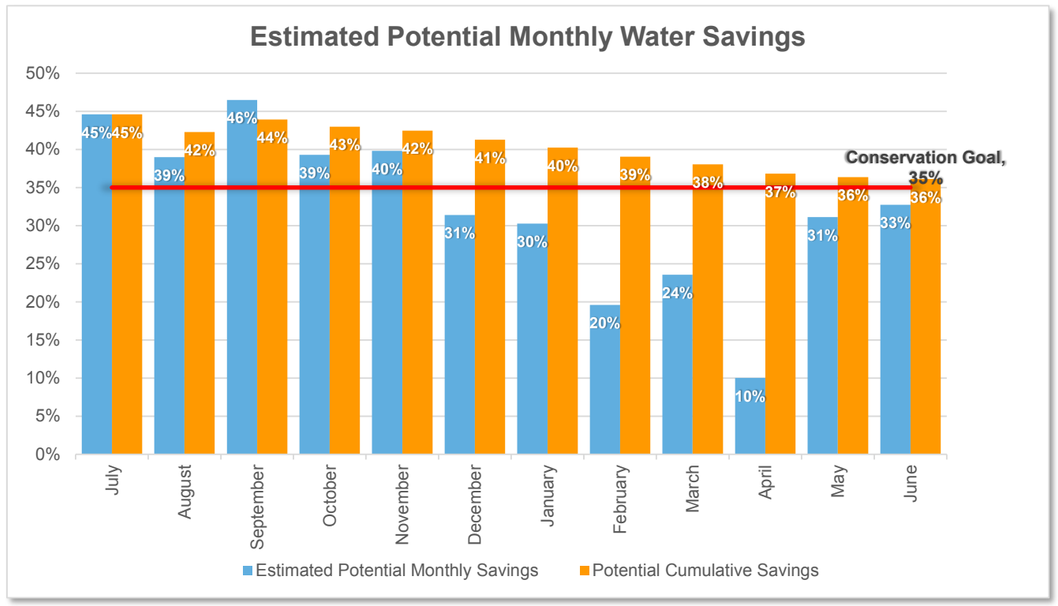
Estimated Monthly Water Use and Savings Summary

Units: (af)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (af)	Estimated Drought Year Production (af)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
July	1,084	601	45%	45%	35%	
August	762	465	39%	42%	35%	
September	1,213	649	46%	44%	35%	
October	789	479	39%	43%	35%	
November	780	469	40%	42%	35%	
December	551	378	31%	41%	35%	
January	535	373	30%	40%	35%	
February	348	280	20%	39%	35%	
March	431	329	24%	38%	35%	
April	298	268	10%	37%	35%	
May	561	387	31%	36%	35%	
June	565	380	33%	36%	35%	





Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

Enter Agency Information		
Agency Name	North Marin Water District	
Total Population Served	61,658	
Conservation Goal (%)	45%	
Drought Stage	Stage 5	
Number of Residential Accounts	18,699	
Number of Commercial, Industrial, and Institutional (CII) Accounts	909	
Number of Dedicated Irrigation Accounts	356	
Baseline Year(s)	2019	FY
Percentage of Residential Indoor Use During Minimum Month (%)	100%	
Percentage of CII Indoor Use During Minimum Month (%)	100%	
Comments		

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

6 - DROUGHT RESPONSE TRACKING	**Track production and water savings against the conservation target.**

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100

2 - Input Baseline Year (2019) Water Use

North Marin Water District

Input Baseline Year (2019) Production and Water Use

Units: (af)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (af)	Residential Water Use (af)	CII Water Use (af)	Dedicated Irrigation Water Use (af)	Non-Revenue Water Use (af)	Total R-GPCD	Comments
July	1,084	686	186	157	55	117	NRW is assumed to be 4%.
August	762	567	101	60	34	97	Water use is reported on a fiscal-year basis.
September	1,213	789	171	189	64	139	
October	789	591	100	59	40	101	
November	780	538	99	100	42	95	
December	551	423	74	29	25	72	
January	535	403	73	31	27	69	
February	348	274	54	4	16	52	
March	431	326	69	14	21	56	
April	298	232	50	3	13	41	
May	561	354	153	27	28	60	
June	565	429	83	27	27	76	

3 - Baseline Year (2019) Water Use Profile

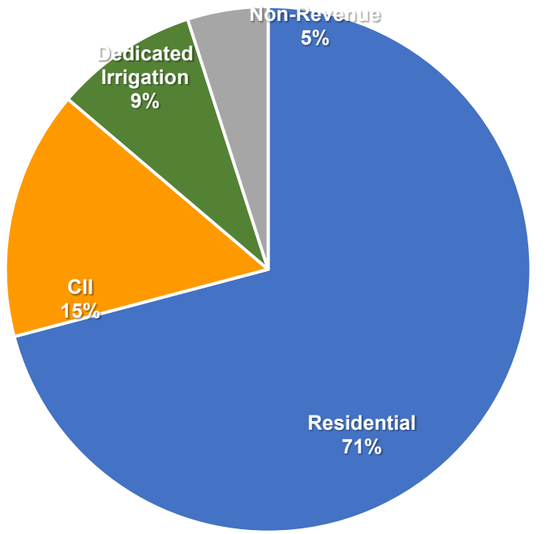
North Marin Water District

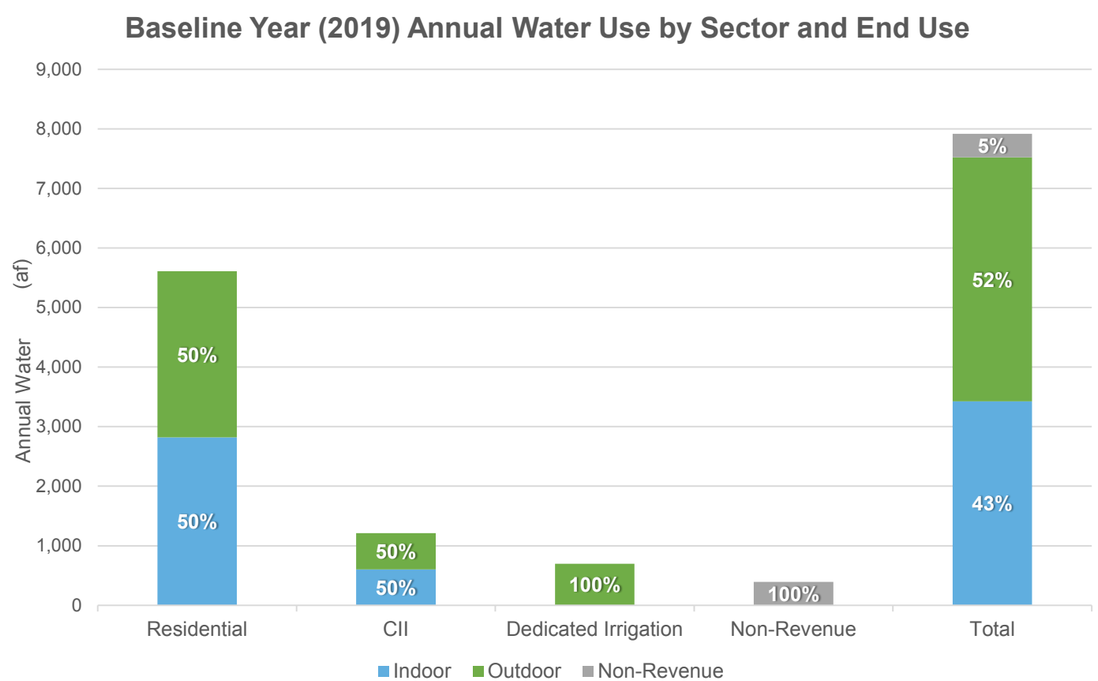
Baseline Year (2019) Annual Water Use Summary

Units: (af)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

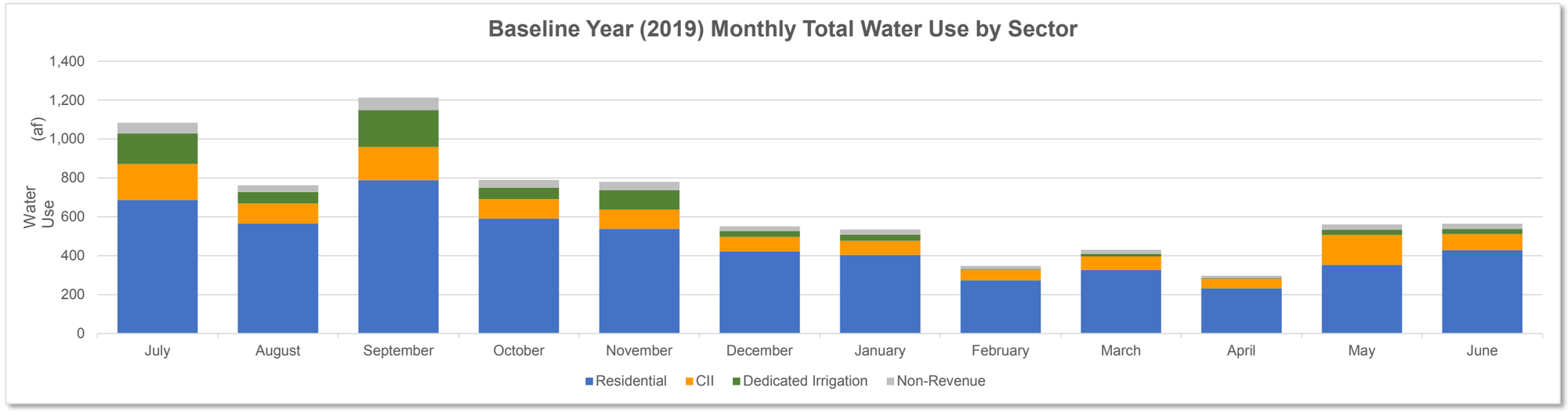
Water Use	Total Production (af)	Water Use (af)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	7,916	5,611	1,214	699	392	
Total Indoor	3,426	2,821	605	--	--	
Total Outdoor	4,097	2,789	609	699	--	
Total Non-Revenue	392	--	--	--	392	
Total Indoor %	43%	50%	50%	0%	--	
Total Outdoor %	52%	50%	50%	100%	--	
Total Non-Revenue %	5%	--	--	--	100%	

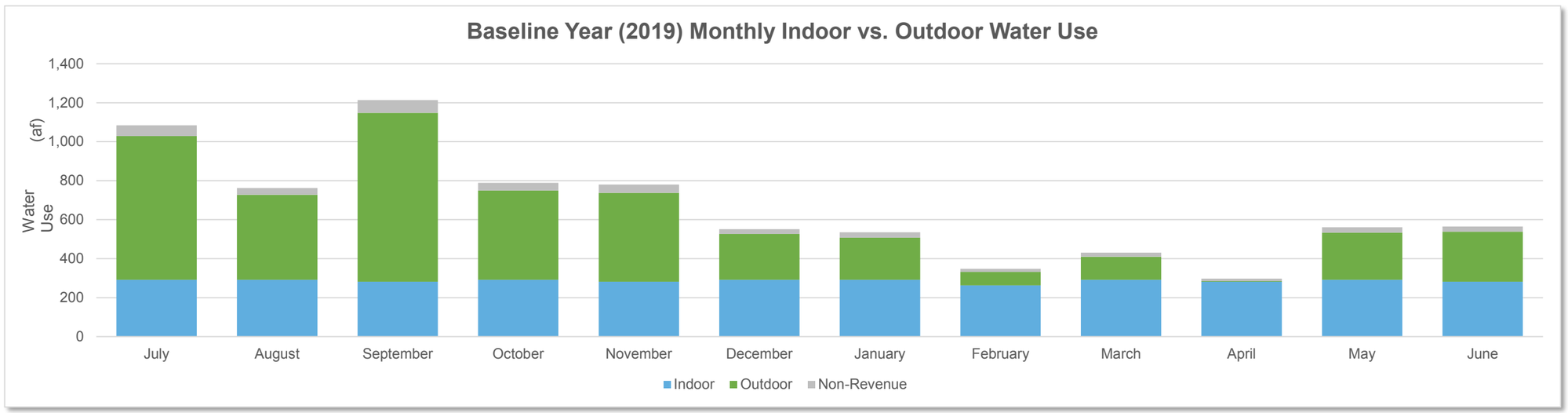




3 - Baseline Year (2019) Water Use Profile

North Marin Water District



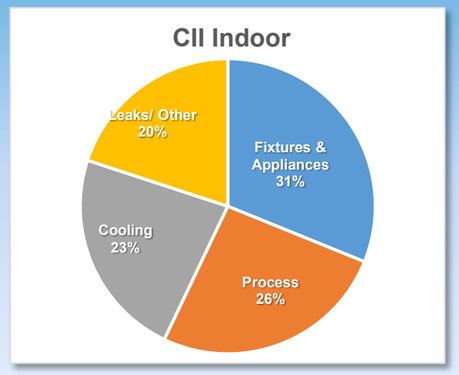


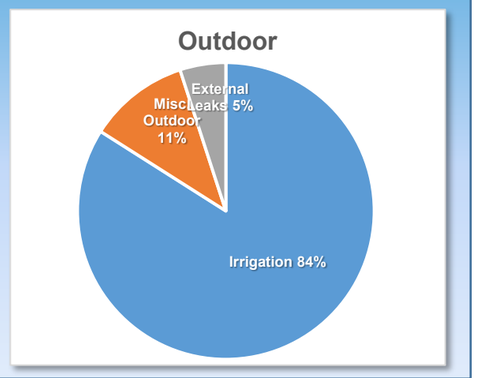
4 - Drought Response Actions - Stage 5

North Marin Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**70%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





4 - Drought Response Actions - Stage 5

North Marin Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**90%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☑	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☑	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☑			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☑			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 5

North Marin Water District

Drought Response Actions						
Action Description	**End Use(s)**	**Implement Program**	**End Use Savings (%)**	**Implementation Rate**	**Source of Default Savings Estimate**	**Source of Default Implementation Rate**
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	**1.5%**	**80%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	**1.5%**	**80%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	**1.5%**	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%		--	--
Home or Mobile Water Use Reports	All	☐	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☐	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☐	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	38%	80%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	79%	90%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	**70%**		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

4 - Drought Response Actions - Stage 5

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	38%	80%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	79%	90%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	**70%**		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	**35%**	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 7PM and 9AM	Irrigation	☐	38%	80%	UC IPM, 2014	--
Limit Irrigation to 0 Day/Week, 10 Minutes/Day, Between 7PM and 9AM	Irrigation	☑	**100%**	**70%**		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☑		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	**10%**	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 5

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 5

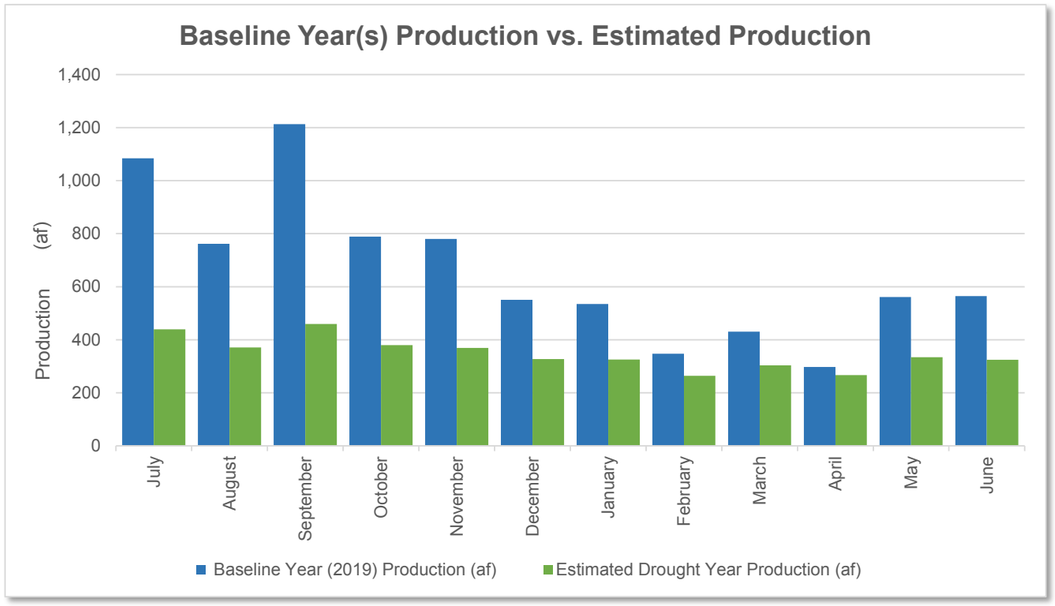
North Marin Water District

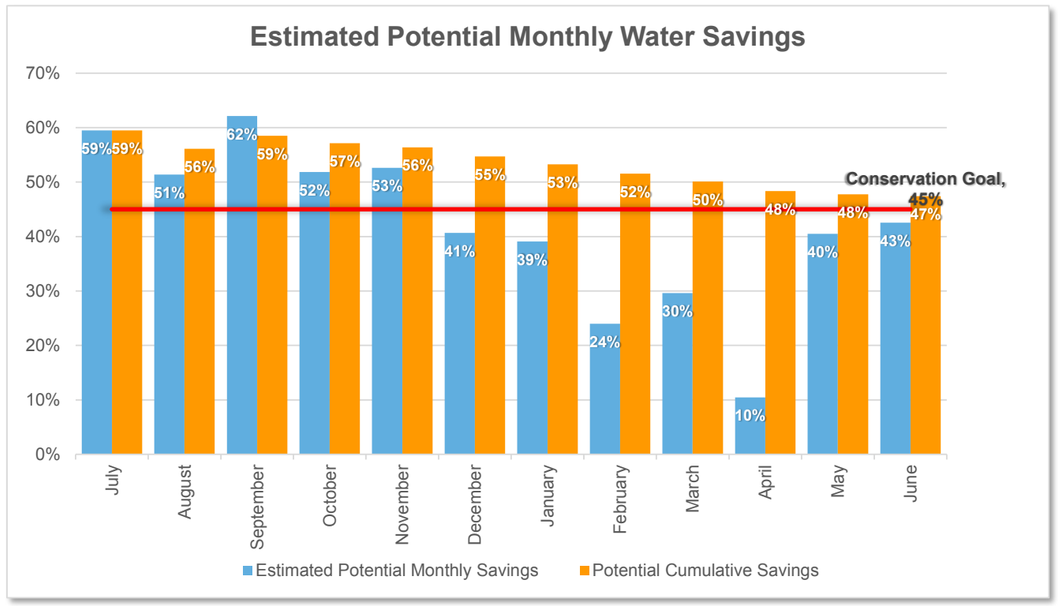
Estimated Monthly Water Use and Savings Summary

Units: (af)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (af)	Estimated Drought Year Production (af)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
July	1,084	439	59%	59%	45%	
August	762	371	51%	56%	45%	
September	1,213	459	62%	59%	45%	
October	789	380	52%	57%	45%	
November	780	369	53%	56%	45%	
December	551	327	41%	55%	45%	
January	535	326	39%	53%	45%	
February	348	264	24%	52%	45%	
March	431	303	30%	50%	45%	
April	298	267	10%	48%	45%	
May	561	334	40%	48%	45%	
June	565	324	43%	47%	45%	





Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

Enter Agency Information		
Agency Name	North Marin Water District	
Total Population Served	61,658	
Conservation Goal (%)	55%	
Drought Stage	Stage 6	
Number of Residential Accounts	18,699	
Number of Commercial, Industrial, and Institutional (CII) Accounts	909	
Number of Dedicated Irrigation Accounts	356	
Baseline Year(s)	2019	FY
Percentage of Residential Indoor Use During Minimum Month (%)	100%	
Percentage of CII Indoor Use During Minimum Month (%)	100%	
Comments		

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

6 - DROUGHT RESPONSE TRACKING	**Track production and water savings against the conservation target.**

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

North Marin Water District

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100

2 - Input Baseline Year (2019) Water Use

North Marin Water District

Input Baseline Year (2019) Production and Water Use

Units: (af)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (af)	Residential Water Use (af)	CII Water Use (af)	Dedicated Irrigation Water Use (af)	Non-Revenue Water Use (af)	Total R-GPCD	Comments
July	1,084	686	186	157	55	117	NRW is assumed to be 4%.
August	762	567	101	60	34	97	Water use is reported on a fiscal-year basis.
September	1,213	789	171	189	64	139	
October	789	591	100	59	40	101	
November	780	538	99	100	42	95	
December	551	423	74	29	25	72	
January	535	403	73	31	27	69	
February	348	274	54	4	16	52	
March	431	326	69	14	21	56	
April	298	232	50	3	13	41	
May	561	354	153	27	28	60	
June	565	429	83	27	27	76	

3 - Baseline Year (2019) Water Use Profile

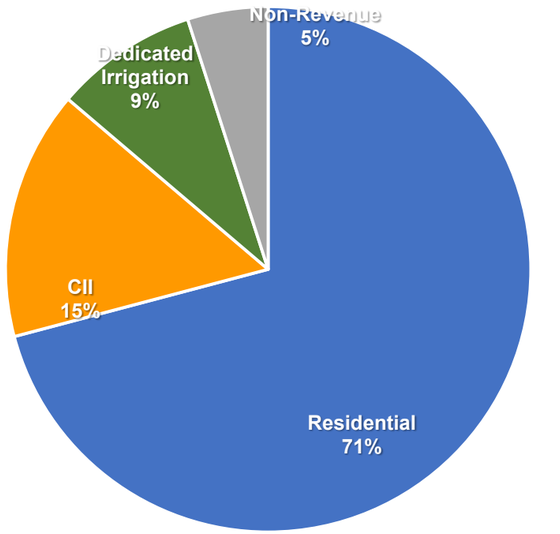
North Marin Water District

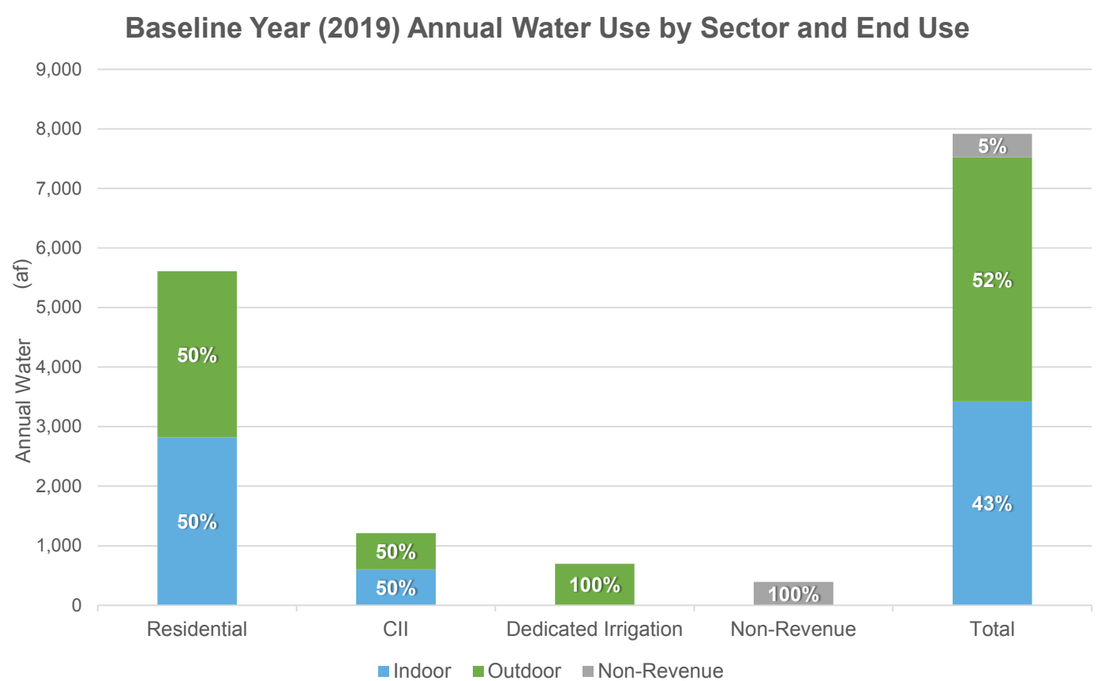
Baseline Year (2019) Annual Water Use Summary

Units: (af)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

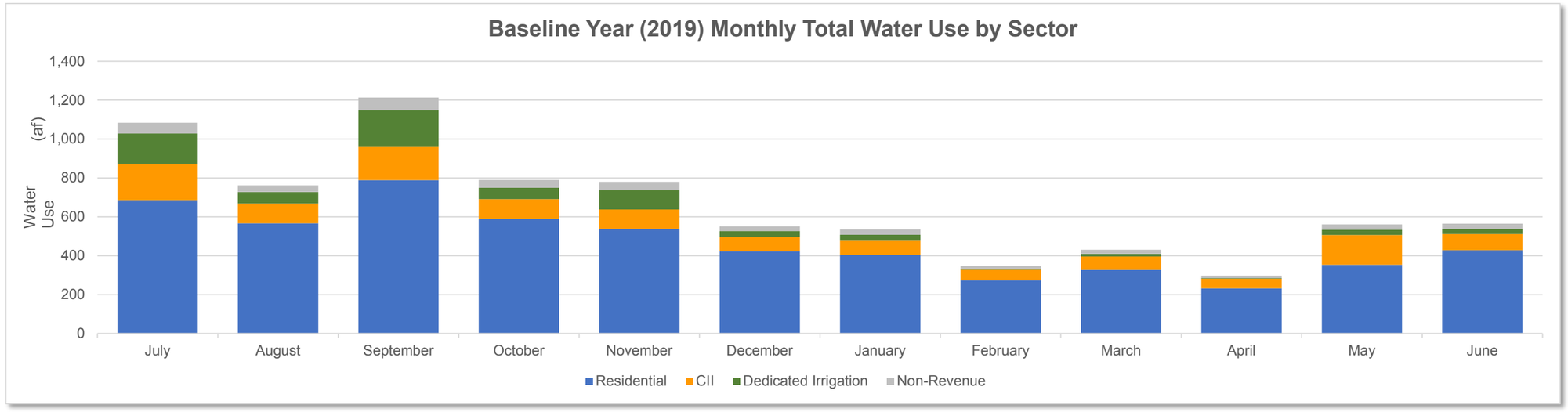
Water Use	Total Production (af)	Water Use (af)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	7,916	5,611	1,214	699	392	
Total Indoor	3,426	2,821	605	--	--	
Total Outdoor	4,097	2,789	609	699	--	
Total Non-Revenue	392	--	--	--	392	
Total Indoor %	43%	50%	50%	0%	--	
Total Outdoor %	52%	50%	50%	100%	--	
Total Non-Revenue %	5%	--	--	--	100%	

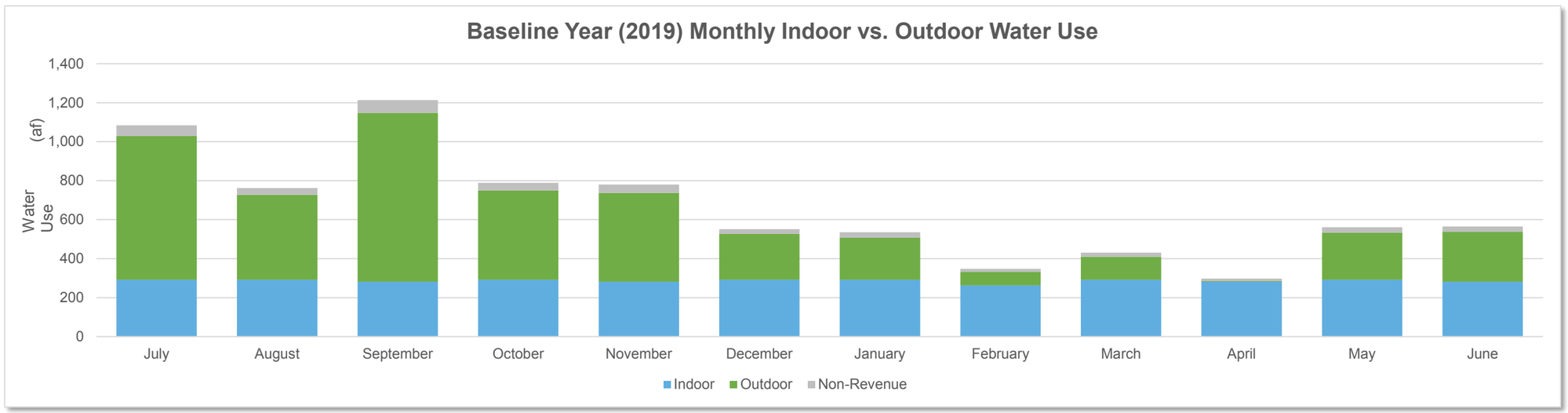




3 - Baseline Year (2019) Water Use Profile

North Marin Water District



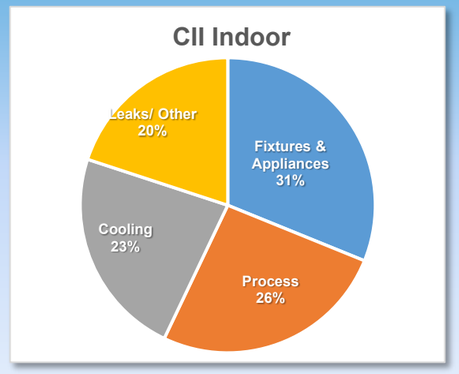


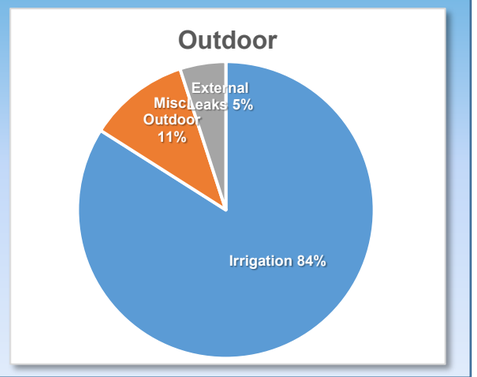
4 - Drought Response Actions - Stage 6

North Marin Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**70%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





4 - Drought Response Actions - Stage 6

North Marin Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**85%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☑	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☑	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☑			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☑			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 6

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	**1.5%**	**80%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	**1.5%**	**80%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	**1.5%**	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%		--	--
Home or Mobile Water Use Reports	All	☐	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☐	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☐	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	80%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	**95%**		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

4 - Drought Response Actions - Stage 6

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	**38%**	**80%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	**35%**	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 55% Reduction	All Residential Uses	☑	**55%**	**90%**	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	**38%**	**80%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☑		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	**10%**	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 55% Reduction	All CII uses	☑	**55%**	**90%**	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 6

North Marin Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 6

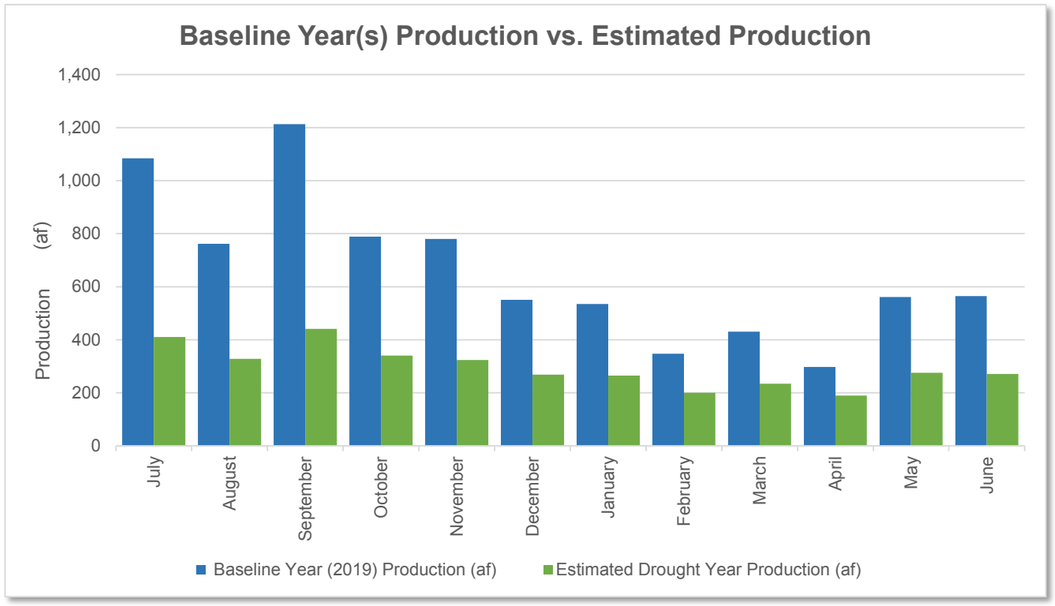
North Marin Water District

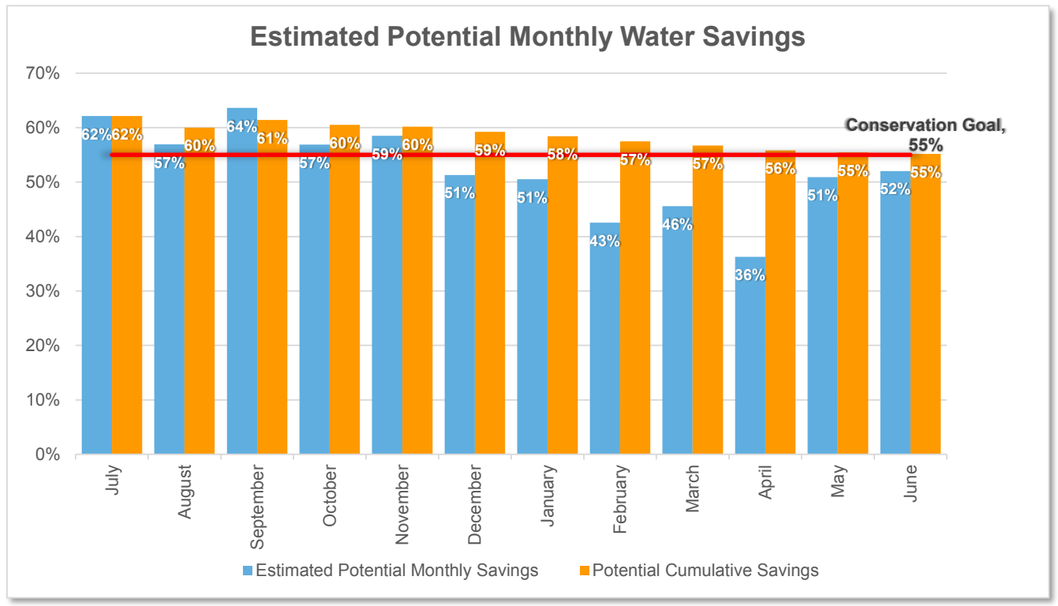
Estimated Monthly Water Use and Savings Summary

Units: (af)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (af)	Estimated Drought Year Production (af)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
July	1,084	411	62%	62%	55%	
August	762	328	57%	60%	55%	
September	1,213	441	64%	61%	55%	
October	789	340	57%	60%	55%	
November	780	324	59%	60%	55%	
December	551	268	51%	59%	55%	
January	535	265	51%	58%	55%	
February	348	200	43%	57%	55%	
March	431	234	46%	57%	55%	
April	298	190	36%	56%	55%	
May	561	275	51%	55%	55%	
June	565	271	52%	55%	55%	





NORTH MARIN WATER DISTRICT

ATTACHMENT 3

2018 MARIN COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Available at the Following Link:

https://www.marinwatersheds.org/sites/default/files/2020-07/Marin%20County%20Multi-Jurisdictional%20Local%20Hazard%20Mitigation%20Plan%202018.pdf

NORTH MARIN WATER DISTRICT

ATTACHMENT 4

SONOMA COUNTY WATER AGENCY LOCAL HAZARD MITIGATION PLAN

Available at the Following Link:

https://evogov.s3.amazonaws.com/185/media/186587.pdf

NORTH MARIN WATER DISTRICT

ATTACHMENT 5

WATER SHORTAGE CONTINGENCY PLAN RESOLUTIONS

RESOLUTION 21-09

RESOLUTION OF THE BOARD OF DIRECTORS OF NORTH MARIN WATER DISTRICT ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN FOR THE NOVATO SERVICE AREA

WHEREAS, the Urban Water Management Planning Act, codified at California Water Code Section 10610 *et seq.*, requires that every urban water supplier directly or indirectly supplying water for municipal purposes to more than 3,000 customers prepare an Urban Water Management Plan (UWMP), the primary objective of which is to plan for the conservation and efficient use of water while balancing supply and demand; and

WHEREAS, pursuant to Water Code Section 10620(d)(2), each urban water supplier shall develop its own Water Shortage Contingency Plan (WSCP); and

WHEREAS, in November of 2020 and May of 2021, the North Marin Water District (District) circulated notice to other appropriate public agencies in the Marin and Sonoma County area that it was preparing a draft 2020 UWMP and WSCP; and

WHEREAS, District staff, with assistance from District consultant EKI Environment & Water, Inc., prepared the draft 2020 UWMP and WSCP in accordance with the requirements of the Urban Water Management Planning Act and made the draft 2020 UWMP and WSCP available for public review on June 1, 2021; and

WHEREAS, prior to, and at a duly noticed public hearing on June 15, 2021, the District's Board of Directors received and considered comments regarding the draft 2020 UWMP and WSCP and incorporated revisions and comments as appropriate.

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of North Marin Water District as follows:

1. The Board of Directors does hereby find, determine and declare that the foregoing Recitals are true and correct, and incorporates the Recitals herein.
2. The Board of Directors does hereby approve and adopt the 2020 Urban Water Management Plan and all appendices.
3. The Board of Directors does hereby approve and adopt the Water Shortage Contingency Plan, which comprises Section 8 and Appendix G of the 2020 Urban Water Management Plan.

* * * * *

I hereby certify that the foregoing is a true and complete copy of a resolution duly and regularly adopted by the Board of Directors of NORTH MARIN WATER DISTRICT at a regular meeting of said Board held on the June 15, 2021 by the following vote:

AYES:	Directors Baker, Fraites, Grossi, Joly, Petterle
NOES:	None
ABSENT:	None
ABSTAINED:	None

Theresa, Secretary
North Marin Water District

(SEAL

NORTH MARIN WATER DISTRICT

Appendix H

NORTH MARIN WATER DISTRICT REGULATION 15 – WATER CONSERVATION – NOVATO SERVICE AREA

NORTH MARIN WATER DISTRICT

REGULATION 15

WATER CONSERVATION - NOVATO SERVICE AREA

A. Purpose

The purpose of this regulation is to assure that water resources available to the District are put to reasonable beneficial use, that the instream values of Novato Creek and the Russian River are preserved to the maximum possible extent and that the benefits of the District's water service extend to the largest number of persons.

B. Waste of Water Prohibited

(1) Customers shall not permit any water furnished by the District for the following nonessential uses:

(a) The washing of sidewalks, walkways, driveways, parking lots and other hard surfaced areas by direct hosing when runoff water directly flows to a gutter or storm drain, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety;

(b) The escape of water through breaks or leaks within the customers' plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of seventy-two (72) hours after the customer discovers such a break or leak or receives notice from the District, is a reasonable time within which to correct such break or leak, or, as a minimum, to stop the flow of water from such break or leak;

(c) Irrigation in a manner or to an extent which allows excessive run-off of water or unreasonable over-spray of the areas being watered. Every customer is deemed to have his/her water system under control at all times, to know the manner and extent of his/her water use and any run-off, and to employ available alternatives to apply irrigation water in a reasonably efficient manner;

(d) Washing cars, boats, trailers or other vehicles and machinery directly with a hose not equipped with a shutoff nozzle;

(e) Water for non-recycling decorative water fountains;

(f) Water for new non-recirculating conveyor car wash systems;

(g) Water for new non-recirculating industrial clothes wash systems;

(h) Water for single pass coolant systems.

(2) Exempt Water Uses. All water use associated with the operation and maintenance of fire suppression equipment or employed by the District for water quality flushing and sanitation purposes shall be exempt from the provisions of this section. Use of water supplied by a private well or from a recycled water, gray water or rainwater utilization system is also exempt.

(3) Variances. Any customer of the District may make written application for a variance. Said application shall describe in detail why Applicant believes a variance is justified.

(a) The General Manager of the District may grant variances for use of water otherwise prohibited by this section upon finding and determining that failure to do so would cause an emergency condition affecting the health, sanitation, fire protection or safety of the Applicant or public; or, cause an unnecessary and undue hardship on Applicant or public, including but not limited to, adverse economic impacts, such as loss of production or jobs.

(b) The decision of the General Manager of the District may be appealed to the Board of Directors by submitting a written appeal to the District within fifteen (15) calendar days of the day of the General Manager's decision. Upon granting any appeal, the Board of Directors may impose any conditions it determines to be just and proper. Variances granted by the Board of Directors shall be prepared in writing and the Board of Directors may require the variance be recorded at Applicant's expense.

(4) Enforcement. Depending on the extent of the water waste, the District may, after written or verbal notification to customer and after a reasonable time to correct the violation as solely determined by the District, take some or all of the following actions:

(a) Telephone the customer to inform of the water waste violation including a specified period of time to correct the violation;

(b) Personal contact with the customer at the address of the water service. If personal contact is unsuccessful, written notice of the violation including a date that the violation is to be corrected may be left on the premises with a copy of the notice sent by certified mail to the customer;

(c) The District may install a flow-restricting device on the service line;

(d) The District may cause termination of water service and the charge for same shall be billed to the customer. Except in cases of extreme emergency as solely determined by the General Manager of the District, service shall not be reinstated until verified by the District that the violation has been corrected and all outstanding charges have been paid.

(e) The District may impose a penalty, in an amount approved by the Board from time to time, to be assessed on the customer water bill.

C. Use of Water Saving Devices

Each customer of the District is urged to install water efficient devices that meet or exceed EPA WaterSense standards, including but not limited to showerheads, sink aerators and toilets.

D. Water-Saving Fixtures/Devices/Equipment

The District will make available from time to time to customers the following devices and incentives:

(1) A device or devices for reducing shower and sink flow rates;

(2) A dye tablet or tablets for determining toilet leaks;

(3) Other devices from time to time approved by the District;

(4) Rebates from time to time for District qualified hot water recirculation systems, greywater systems, and rainwater catchment systems.

E. Water-Saving Devices and Restrictions for New Development

(1) Water service will not be furnished to any Applicant unless the water-saving devices hereinafter described are installed. Applicants for single service installations serving one dwelling unit (d.u.) or one d.u. and an accessory d.u. or Applicants for projects for which the District does not have final building permit sign off authority, shall pay a $1,000 deposit per d.u. to be refunded upon post inspection of the installation of the water-saving devices and restrictions and compliant water efficient landscape (section F) herein. All other projects may be subject to a water conservation deposit with amount and applicability determined by the General Manager on a case-by-case basis. Applicant shall have two years to complete the project, obtain District inspection approval and request a refund of the deposit. If after two years the project is not completed, the deposit will be forfeited to the District to be used for other Water Conservation Programs. If requested by the Applicant, the District may extend the time period for the project completion up to one additional year,

(2) All interior plumbing and appliances in new development shall meet the following requirements:

(a) Toilets and associated flush valves shall be High Efficiency Toilets (HETs), rated at not more than 1.28 gallons per flush on average, and shall be listed on the approved District HET list;

(b) Urinals and associated flush valves shall be rated at not more than 0.125 gallons per flush or be a District approved non-water using urinal;

(c) Shower heads shall have a rated flow of 2.0 gallons per minute or less, and only one shower head will be allowed per bathroom;

(d) Lavatory faucets and hand-washing sinks shall have aerators or laminar flow devices together with flow control inserts, valves, devices or orifices that restrict flow to a maximum of 1.5 gallons per minute in residential construction and 0.5 gallons per minute in commercial construction. Kitchen faucets shall have a maximum flow of 2.0 gallons per minute in all construction;

e) Laundry facility washing machines shall be District approved high-efficiency models with an integrated water factor of 4.5 or less;

(f) Dishwashers shall be high efficiency models with an Energy Star rating that use no more than 5 gallons per cycle;

F. Water Efficient Landscape Requirement

(1) Purpose. Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall not extend to waste or unreasonable method of use. This Regulation protects water supplies through the implementation of a whole systems approach to design, construction, installation and maintenance of the landscape resulting in water conserving climate-appropriate landscapes, improved water quality and the minimization of natural resource inputs.

(2) Applicability

a. Requirements stated herein shall apply to all of the following new and rehabilitated landscape projects associated with construction that requires a Building or Grading Permit, Plan Check, Design Review or water service upgrade for Commercial,

industrial and institutional landscaping, park and greenbelt landscaping, multiple-family residential and single-family residential landscaping.

i. At District discretion, landscape requirements for applicable projects may be deferred to the State Model Water Efficient Landscape Ordinance (California Code of Regulations Title 23. Waters, Division 2. Department of Water Resources, Chapter 2.7. Model Water Efficient Landscape Ordinance).

ii. For projects with irrigated landscape area less than 2,500 square feet, the District may choose to select any or all of the requirements to the State Model Water Efficient Landscape Ordinance (Referenced above), Appendix D – Prescriptive Compliance Option.

b. Requirements stated herein shall not apply to:

i. Registered local, state or federal historical landscape area;

ii. Ecological restoration or mined-land reclamation projects that do not require a permanent irrigation system.

(3) Landscape Design Plan. For each landscape project subject to this Regulation, applicants shall submit a landscape design plan and install a landscape in accordance with the following:

a. Amendments, Mulching and Soil Conditioning

i. A minimum of 8” of non-mechanically compacted soil shall be available for water absorption and root growth in planted areas.

ii. Prior to incorporating compost or fertilizer and planting of any materials, compacted soils shall be transformed into a friable condition.

iii. Incorporate compost or natural fertilizer into the soil to a minimum depth of 8" at a minimum rate of 8 cubic yards per 1000 square feet and per specific amendment recommendations from a soils management report.

iv. A minimum 3” layer of District approved mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers or direct seeding applications. Mulch shall be made from recycled or post-consumer materials when possible.

b. Plants

i. Selected plants, other than the allowable turf areas in residential projects, shall be Water Use Classification of Landscape Species (WUCOLS) categorized “Very Low” or “Low” water use for the North-Central Coastal Region and not cause the Estimated Water Use (ETWU) to exceed the Maximum Applied Water Allowance (MAWA) using an evapotranspiration factor of 0.55 for residential and 0.45 for non-residential sites and a WUCOLS corresponding plant factor of 0.3 or less for Very Low or Low water use plants. (Special Landscape Areas including areas dedicated to edible plants, recreational areas, or areas irrigated solely with recycled water shall not be subjected to the plant selection requirements and shall use an evapotranspiration factor of 1.0 for the purposes of calculating ETWU and MAWA.)

ii. Plants with similar water use needs shall be grouped together in distinct hydrozones and where irrigation is required each distinct hydrozone shall be

irrigated with a separate valve(s) and noted on the plans.

iii Moderate and High water use plants as classified by WUCOLS shall not be mixed with low water use plants.

iv. All non-turf plants shall be selected, spaced and planted appropriately based upon their adaptability to the climatic, soils, and topographical conditions of the project site.

v. Turf shall not be planted in the following conditions:

1. Slopes exceeding 10%.

2. Planting areas 10 feet wide (in any direction) or less unless irrigated by District approved subsurface irrigation or with recycled water.

3. Street medians, traffic islands, planter strips or bulb-outs of any size. Front yard landscaping of single family residential homes where the backyard landscape is not developer installed.

vi. Total turf areas shall not exceed the following

1. Single Family: 25% of the total landscape area not to exceed 600 square feet.

2. Townhouse/Condominium (THC): 300 square feet.

3. Apartment (APT): 130 square feet.

4. Commercial and/or non-residential: 0 square feet.

5. Special Landscape Areas: The preceding turf limitations shall not apply to sites irrigated with recycled water or areas dedicated to District approved recreational uses.

vii. Invasive plants as listed by the California Invasive Plant Council are prohibited.

c. Water Features

i. Recirculating water systems shall be used for water features.

ii. Recycled water shall be used in water features when available onsite.

(4) Irrigation Design Plan. For each landscape project subject to this Regulation, applicants shall submit an irrigation design plan that is designed and installed to meet the MAWA irrigation efficiency criteria and in accordance with the following:

a. Dedicated irrigation meter or private landscape water or submeter for residential must be specified for all non-residential irrigated landscapes and residential irrigated landscapes of 5,000 sq. ft. or greater.

b. Irrigation systems with meters 1 ½" or greater, or non-residential projects with irrigated landscapes over 5,000 square feet, require a high-flow sensor that can detect high-flow conditions and have the capabilities to shut off the system.

c. Isolation valves shall be installed at the point of connection and before each valve or valve manifold.

d. Weather-based or other sensor based self-adjusting irrigation controllers with non-volatile memory shall be required.

e. Rain sensors shall be installed for each irrigation controller.

f. Pressure regulation and/or booster pumps shall be installed so that all components of the irrigation system operate at the manufacturer's recommended optimal pressure.

g. Irrigation system shall be designed to prevent runoff or overspray onto non-targeted areas.

h. Point source irrigation is required where plant height at maturity will affect the uniformity of an overhead system.

i. Minimum 24" setback of overhead irrigation is required where turf is directly adjacent to a continuous hardscape that flows or could runoff into the curb and gutter.

j. Slopes greater than 10% shall be irrigated with point source or other low-volume irrigation technology.

k. A single valve shall not irrigate hydrozones that mix high water use plants with moderate or low water use plants.

l. Trees shall be placed on separate valves.

m. All non-turf landscape areas shall be irrigated with District approved drip irrigation systems or other alternative District approved point source irrigation.

n. Sprinkler heads, rotors and other emission devices on a valve shall have matched precipitation rates. All spray irrigation systems shall be a brake rotary type or be multi-stream, multi-trajectory, adjustable arc, rotating stream sprinkler with matched precipitation rates. All rotating stream sprinkler units shall be installed in a 40 psi pressure regulated spray head body and provide the highest potential distribution uniformity. All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher.

o. Head-to-head coverage is required unless otherwise directed by the manufacturer's specifications

p. Swing joints or other riser protection components are required on all risers.

q. Check valves shall be installed to prevent low-head drainage.

r. Master shut-off valves are required on all projects with irrigated landscapes over 5,000 square feet.

s. Irrigation efficiency factors of 0.75 for overhead spray devices and 0.81 for drip system devices shall be used for ETWU and MAWA calculations.

t. A diagram of the irrigation plan, including hydrozones and equipment locations, shall be provided and kept with the irrigation controller for subsequent management purposes.

(5) Irrigation Audit: Project applicants shall submit an irrigation audit report for all applicable projects.

a. The project applicant shall submit an irrigation audit report that includes inspection, system tune-up, system test with distribution uniformity, reporting overspray or run

off that causes overland flow, and preparation of an irrigation schedule, including configuring irrigation controllers with application rate, soil types, plant factors, slope, exposure and any other factors necessary for accurate programming

b. All landscape irrigation audits shall be conducted by a local agency landscape irrigation auditor or a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed or installed the landscape.

c. In production home developments, audits of 15% of the landscapes shall be sufficient.

G. Rebate for High-Efficiency Washing Machines in Residences

District customers in the Novato Service area are eligible for rebate as available from time to time for District approved high-efficiency washing machines in existing residences. New construction in the District's Novato service area are required to be equipped with high-efficiency washing machines in accordance with Section E. (2) (e) of this regulation. District rebates are not available for high-efficiency washing machines required in new residential construction.

H. Rebate for Removing Irrigated Turf from Residential Properties

(1) The owner of property containing a formal lawn area or areas shall be eligible for a cash rebate from the District if said owner removes all or part of the formal lawn area(s) and replaces same with eligible plant materials and meets the qualification requirements. "Formal lawn area" means an existing lawn in good condition which is irrigated regularly, by an automatic inground irrigation system, with water furnished by the District and mowed regularly.

(2) Qualification requirements:

(a) Application for rebate must be made on District's form prior to removing the formal lawn area(s). All applicable information requested must be supplied;

(b) Application for rebate must include a landscape plan or sketch showing the size, in square feet, and location of all formal lawn area(s) on the Applicant's parcel and the location of formal lawn area(s) that will be removed and replaced;

(c) The Applicant must utilize only eligible replacement materials for the formal lawn area(s) removed which are to be considered in calculating the rebate. Eligible replacement materials are District approved water-conserving or low water use California native plants;

(d) If the automatic in-ground irrigation system will continue to serve some remaining formal lawn area(s), Applicant must modify the system so that water is not served to the proposed replacement area;

(e) Formal lawn area(s) removed and replanted with eligible replacement materials shall be mulched with material suitably thick to prevent weed growth (minimum three inches) and reduce water loss. Areas shall not be irrigated except for limited supplemental hand-watering or temporary drip irrigation to establish the plant material;

(f) The owner of the property must sign a statement promising not to reinstall lawn in formal lawn area(s) where lawn has been removed as long as the

owner holds property. The owner may be relieved of this promise at any time by returning the full amount of the District's rebate;

(g) The General Manager may at any time halt or suspend acceptance of applications for rebate if the District's funds appropriated for this purpose become exhausted.

(3) After reviewing the information supplied by the Applicant and making at least one site inspection to assure that qualification conditions have been met, District shall mail a rebate check.

(4) The amount of the rebate shall be determined by the Board from time-to-time.

(5) Rebates may be available for non-residential property or for hotels, motels, hospitals, government housing or a senior citizen complex on a parcel which is separately owned and assessed. Maximum rebate amount for a non-residential property shall be determined by General Manager on a case-by-case basis.

I. Landscape Rebate Alternatives

(1) The District will consider, and may approve, requests to substitute for any of the requirements in section H, well-designed alternatives or innovations that will effect similar significant and continuing reductions of water requirements. Determination of eligibility shall be at the sole discretion of the General Manager or designated staff.

J. High Efficiency Toilet Replacement Program(s)

(1) A High Efficiency Toilet (HET) is defined as any toilet with an average flush volume of 1.28 gallons per flush or less. Ultra High Efficiency Toilet (UHET) is defined as any toilet with an average flush volume of 1.1 gallons per flush or less.

(2) Any qualifying customer of the District who removes and recycles all toilets rated to use more than 1.6 gallons per flush and replaces same with a District approved HET or UHET may request a cash rebate or bill credit in an amount established by the Board of Directors from time to time for each such toilet replaced.

(3) To qualify for a rebate(s) hereunder, application shall be made on a form available from the District and person signing application shall:

(a) Request District make a brief inspection of customer's structure at a time and date approved in advance by customer to identify water conservation measures appropriate and effective for the customer to implement or be pre-qualified by District staff via other communication means. Should customer refuse access for an inspection or not receive pre-qualification, District shall not be under any obligation to make a rebate. Inspection requirements are subject to available staff time;

(b) Be a customer of the District and the customer's structure in which the replaced toilet(s) is located shall be served water in the District's Novato Service Area and replacing a toilet installed prior to January 1, 1992, and manufactured to flush more than 1.6 gallons per flush;

(c) Provide District with bill of sale or original receipt of sale within the current fiscal year and made out to said customer by person or vendor selling

customer the HET or UHET or, in lieu thereof, provide District with letter addressed to said customer signed by a licensed plumber or contractor stating that a HET(s) or UHET(s) has been installed by said plumber or contractor at the customer's address;

(4) If the customer is renting the structure, a rebate will be made provided customer includes with the application a letter from the owner of the property consenting to District making rebate payment to customer for the replacement of a non-water conserving toilet(s).

(5) Rebates are not available for toilets installed in buildings constructed after January 1, 1992 or for replacement of toilets rated to use 1.6 gallons per flush or less.

(6) Free or subsidized UHET giveaways may be available to customers from time to time. Eligibility requirements listed in J (3) (a) to (d) apply to this program should it become available.

K. Landscape Water Efficiency Rebate

(1) Landscape water efficient rebates are available to customers who install District qualified water efficient landscape equipment including:

(a) Drip irrigation systems

(b) Water pressure-regulating devices

(c) Check valves

(d) Multi-stream rotating sprinkler nozzles (lawn areas only)

(e) Rain shut-off devices

(f) Mulch

(g) Soil conditioner/amendment

(2) Rebate amounts will be established by the Board of Directors from time to time depending on customer classification and water savings potential. Customers are allowed only up to the maximum rebate level for the life of the program.

(3) Applicant shall request and agree to a brief District pre-inspection of customer's property to identify water efficient landscape actions to be taken. District will pre-approve and post inspect to confirm the retrofit installations. Inspections are subject to available staff time.

(4) Applicant shall provide District with a complete bill of sale or original receipt of sale within the current fiscal year, clearly showing the purchase of the landscape water efficiency installed items noted in the pre-inspection.

(5) Free or subsidized water efficient landscape items such as rain sensors, and mulch may be available to customers. Eligibility requirements listed in K (1) through (3) apply should items become available.

L. Rebates for District Approved Swimming Pool Covers

District customers are eligible for rebates as available from time to time for purchasing District approved swimming pool covers. Eligible pool covers must be a solar or safety cover with non-netted type material, at least 12 mil in thickness, and at least 450 square feet area.

M. Requirement for Installation of Water Conserving Plumbing Fixtures Upon Change of Property Ownership

(1) Definitions.

(a) "Water Conserving Plumbing Fixtures" means any toilet rated at 1.6 gallons of water per flush or less, urinals that that are rated at 1.0 gallons of water per flush, showerheads with a flow rated at 2.0 gallons of water per minute or lavatory faucets that can emit no more than 1.5 gallons of water per minute;

(b) "Change in Property Ownership" means a transfer of present interest of real property, or a transfer of the right to beneficial use thereof, the value of which is substantially equal to the proportion of ownership interest transferred.

(c) "Retrofit" means replacing "Existing Plumbing Fixtures" with "Water-Conserving Plumbing Fixtures;"

(d) "Existing Plumbing Fixtures" means any toilet using more than 1.6 gallons of water per flush, urinals using more than 1.0 gallons of water or more per flush, showerheads with a flow rated more than 2.0 gallons of water per minute or lavatory faucets that emit more than 1.5 gallons of water per minute.

(e) "Existing Structure" means any structure built and available for use or occupancy on or before January 1, 1992, which is equipped with a toilet using more than 1.6 gallons of water per flush or a urinal using more than 1.0 gallons of water per flush.

(2) Retrofit Upon Change of Property Ownership.

All existing plumbing fixtures in existing structures receiving water from the District's water system shall, at the time of change of ownership, be retrofitted, if not already done, exclusively with water conserving plumbing fixtures as defined in Section M(1) of this regulation.

(3) Compliance and Penalties

Compliance shall be by the honor system. It shall be the Seller's responsibility to obtain from the District, in addition to any normal permits required by agencies other than the District, a Certificate of Compliance acknowledging that the Seller or title holder has stated that the retrofit installation required by this Regulation has been completed. If the District later determines or finds that the work was not done or was not completed or that water conserving plumbing fixtures are no longer present, the District may assess an annual fee of 20% of the estimated annual water bill as determined by the District until the owner of the property demonstrates that the required retrofit work has in fact been done. A site inspection shall be required in such cases and the owner shall be charged $35 for each such site inspection as an added fee on the owner's water bill.

(4) Alternative Compliance Procedure for Transfers of Residential Property

At Seller's option, Seller shall pay the District $315 per bathroom that does not fully comply with Regulation 15 M. Half bathrooms shall count as one bathroom. The District shall thereupon immediately provide a Certificate of Compliance to Seller. Buyer shall then be responsible for installation of the water conserving plumbing fixtures and Seller shall provide Buyer with a copy of District Regulation 15 M. and shall notify Buyer of this requirement in writing before close of escrow. Buyer shall have one year from the date of close of escrow to install such fixtures. Upon being notified that said fixtures have been installed and making a brief inspection confirming installation, the District shall pay the Buyer an amount equal to the payment made to District by Seller. If after one year, the water conserving plumbing fixtures have not been installed, the District shall use this money for any other Board approved water conservation program and shall be under no obligation to pay said money to Buyer.

(5) Responsibility for Compliance Negotiable

The Seller is responsible for compliance with Regulation 15 M, however responsibility for payment of the deposit specified in Section M(4) may be assumed by the Buyer so long as the agreement is not otherwise inconsistent with the terms of Regulation 15 M. Any such agreement shall be evidenced in a writing signed by both the Buyer and Seller.

N. Weather Based Irrigation Controller Installation Program

(1) A weather based irrigation controller is defined as any irrigation controller using weather data to create the actual irrigation schedule and which schedule is automatically adjusted by the controller to meet the applied water demand based on actual weather data. Weather based irrigation controllers may either receive “real time” weather data or generate their weather data using an integrated solar radiation sensor.

(2) District customers using more than an average of 600 gallons per day are eligible for rebates or vouchers as available from time to time for purchasing District approved weather based irrigation controllers. Directly installed weather based irrigation controllers may be available from time to time. Customers receiving weather based irrigation controller rebates or vouchers may be subject to a pre and post installation inspection.

O. Exemptions from Provisions Set Forth in Regulation 15 (A. through N.)

(1) Retrofit Exemptions

The District's General Manager may grant an exemption from Section M in the following instances:

(a) Unavailability of Water Conserving Plumbing Fixtures to either match a well-defined historic architectural style fitted with authentic plumbing fixtures or accommodate existing house plumbing without bathroom alteration;

(b) Special health circumstances upon submittal of reasonable evidence that demonstrates that specific plumbing fixtures are required by the user that may not meet the Water Conserving Plumbing Fixture criteria defined by this regulation.

(c) Faucets at kitchen sinks or antique faucets which do not have standard threaded openings for aerators.

(2) Other Exemptions

The District's General Manager may grant exemptions from Section A. through N. for purposes of health, safety and sanitation or if Applicant demonstrates an "at least as effective as" water efficiency alternative. The District's General Manager shall have the sole decision of determining whether Applicant has demonstrated an "at least as effective as" water efficiency alternative.

NORTH MARIN WATER DISTRICT

Appendix I

Resolution 21-09 on 2020 Urban Water Management Plan and Water Shortage Contingency Plan 2020 Update

RESOLUTION 21-09

RESOLUTION OF THE BOARD OF DIRECTORS OF NORTH MARIN WATER DISTRICT ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN FOR THE NOVATO SERVICE AREA

WHEREAS, the Urban Water Management Planning Act, codified at California Water Code Section 10610 *et seq.*, requires that every urban water supplier directly or indirectly supplying water for municipal purposes to more than 3,000 customers prepare an Urban Water Management Plan (UWMP), the primary objective of which is to plan for the conservation and efficient use of water while balancing supply and demand; and

WHEREAS, pursuant to Water Code Section 10620(d)(2), each urban water supplier shall develop its own Water Shortage Contingency Plan (WSCP); and

WHEREAS, in November of 2020 and May of 2021, the North Marin Water District (District) circulated notice to other appropriate public agencies in the Marin and Sonoma County area that it was preparing a draft 2020 UWMP and WSCP; and

WHEREAS, District staff, with assistance from District consultant EKI Environment & Water, Inc., prepared the draft 2020 UWMP and WSCP in accordance with the requirements of the Urban Water Management Planning Act and made the draft 2020 UWMP and WSCP available for public review on June 1, 2021; and

WHEREAS, prior to, and at a duly noticed public hearing on June 15, 2021, the District's Board of Directors received and considered comments regarding the draft 2020 UWMP and WSCP and incorporated revisions and comments as appropriate.

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of North Marin Water District as follows:

1. The Board of Directors does hereby find, determine and declare that the foregoing Recitals are true and correct, and incorporates the Recitals herein.
2. The Board of Directors does hereby approve and adopt the 2020 Urban Water Management Plan and all appendices.
3. The Board of Directors does hereby approve and adopt the Water Shortage Contingency Plan, which comprises Section 8 and Appendix G of the 2020 Urban Water Management Plan.

* * * * *

I hereby certify that the foregoing is a true and complete copy of a resolution duly and regularly adopted by the Board of Directors of NORTH MARIN WATER DISTRICT at a regular meeting of said Board held on the June 15, 2021 by the following vote:

AYES:	Directors Baker, Fraites, Grossi, Joly, Petterle
NOES:	None
ABSENT:	None
ABSTAINED:	None

Theresa, Secretary
North Marin Water District

(SEAL

2001 Junipero Serra Blvd., Suite 300 | Daly City, CA 94014
(650) 292-9100 | Fax (650) 552-9012 | Ekiconsult.com