FINAL

TOWN OF WINDSOR

2010 Urban Water Management Plan

WEST YOST ASSOCIATES

2010 Urban Water Management Plan

Prepared for

Town of Windsor

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WEST YOST ASSOCIATES

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This Urban Water Management Plan (UWMP or Plan) addresses the Town of Windsor (Town) water system and includes a description of the water supply sources, historical and projected water use, and a comparison of water supply to water demands during normal, single-dry, and multiple-dry years. The Town receives the majority of its water from the Russian River Well Field under the Sonoma County Water Agency's (Agency's) water rights with additional supplies delivered directly from the Agency to the Airport Service Area.

This section provides a brief over-view of the contents of this 2010 UWMP Update.

ES.1 INTRODUCTION

This UWMP was prepared in accordance with the Urban Water Management Act (Act), as amended, California Water Code, Sections 10610 through 10657. The Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections, or supplying more than 3,000 AF of water annually, to adopt and submit a plan every five years to the California Department of Water Resources (DWR). This Plan serves as a long-range planning document for the Town's water supply and supply reliability.

In 2010, the Town supplied 3,468 AF of potable water and 1,545 AF of recycled water to approximately 9,200 customers in the Town and surrounding areas within the Town's service area, but located in unincorporated areas of Sonoma County. Therefore the Town is subject to the requirements of the Urban Water Management Planning Act. The Town prepared its first UWMP in 1990; the UWMP was then updated in 1995, 2000, and 2005.

The Town's coordination of the preparation of this 2010 UWMP Update with other agencies, the adoption process, the UWMP outline, and a glossary of terms is also included in Chapter 1.

ES.2 EXISTING SYSTEM

The Town of Windsor was incorporated in 1992. Prior to 1984, the Town, as the Windsor Water District, produced all of its potable water from local groundwater supply wells, including the Bluebird well. Beginning in 1984, the Russian River Well Field was constructed and began pumping water for use by the Town's customers. In 1985, a connection to the Sonoma County Water Agency (SCWA) aqueduct was completed to provide water to the Sonoma County Airport and the Airport Industrial Area, and this area became part of the Town's water service area.

The Town currently supplies potable water to approximately 9,000 residential, commercial, construction, and landscape irrigation customers (service connections) in the Town and surrounding areas. The Town also supplies recycled water to customers within the Town boundary and in unincorporated areas of Sonoma County.

The Town has three water supply sources: the Russian River Well Field, the Agency transmission system, and one off-river groundwater well, called the Bluebird Well, which is currently out of service.

The Russian River Well Field is located on a 27-acre parcel northwest of the Windsor River Road/Eastside Road intersection. The well field, which has been in operation since 1984, currently contains five production wells with capacities of approximately 1,300 gallons per

minute (gpm) each. These wells intercept underflow from the Russian River. The production from the Russian River Well Field is limited under terms of an agreement with the Agency that allows the Town to divert water under the Agency's water rights permits issued by the State Water Resources Control Board (SWRCB). The Town may divert up to 4,725 AF per year (AFY) at a maximum rate of 7.2 million gallons per day (mgd) over 30 days from the well field. The agreement with the Agency extends to 2014, including provisions for a 40-year renewal at no greater quantities.

The Agency water is delivered though a connection to the 36-inch diameter Santa Rosa Aqueduct. The Town connects into the Santa Rosa Aqueduct through a 12-inch diameter water main located adjacent to Laughlin Road in the southern portion of the Airport Outside Service Area. The Agency has been supplying water to the Town since 1985, when the Town agreed to be responsible for being the retail water supplier to the Sonoma County Airport and the Airport Industrial Area and provide up to 900 AFY at a peak flow rate of 1.5 mgd. The Airport Outside Service Area, and hence the 900 AFY service agreement water supply, also includes eight customers on Slusser Road who are provided water directly from the Agency Aqueduct.

The Town also has three local or "off-river" groundwater wells. The Bluebird Well is a 400 foot deep well located at the end of Bluebird Court in Windsor. Constructed in 1972, it had been placed on standby in the mid-1980s when the Russian River Well Field was developed, but had subsequently been used as an off-river supply source to improve system reliability. In 2006, the Bluebird well once more was taken off line because of water quality concerns. The groundwater contained an arsenic concentration greater than 10 parts per billion (ppb), which exceeds the State's lowered arsenic maximum contaminant level of 10 ppb. The Town also owns the Esposti Park Well and Keiser Park wells which are primarily used for park irrigation, as well as serving as a backup or emergency source of potable water.

ES.3 HISTORICAL AND PROJECTED WATER USE

Population and employment projections were developed for the Town. The population and employment forecasts are based on the projections developed by the Association of Bay Area Governments (ABAG). The population projections are described in the analysis performed by Maddaus Water Management, which is presented in Appendix E. Table ES-1 provides current and projected population through the year 2035 for the Town's entire service area.

Table ES-1. Population – Current and Projected (DWR Table 2)

Year	2010	2015	2020	2025	2030	2035
Population Outside Town Limits[a]	934	1,115	1,115	1,115	1,115	1,115
Population Inside Town Limits[b]	25,224	28,400	29,600	30,800	31,700	32,700
Total Service Area Population	26,158	29,515	30,715	31,915	32,815	33,815

[a] Estimated based on current estimates of outside service area population plus the addition of 61 mobile homes in 2011.
[b] Estimated based on Association of Bay Area Governments (ABAG) projections, as reported in the 2010 UWMP Water Demand Analysis and Water Conservation Measures Update (Maddaus November 18, 2010) Appendix E.

The 11-year historical total volume of water produced, the volume of metered water sold to customers, and the volume of unaccounted for water is shown in Table ES-2.

Table ES-2. Historical Water Production and Demand, 2000-2010

Year	Water Production, AF			Used Total, AF	UAF[b], AF	UAF, Percent
	Wells[a]	Purchased	Total			
2000	3,835	320	4,155	3,895	260	6%
2001	4,035	370	4,405	4,136	269	6%
2002	3,760	635	4,394	4,287	107	2%
2003	3,648	478	4,126	4,040	86	2%
2004	4,134	333	4,466	4,312	147	3%
2005	3,726	441	4,167	4,038	131	3%
2006	3,820	628	4,448	4,224	224	5%
2007	3,889	528	4,418	4,325	36	2%
2008	3,957	509	4,467	4,332	135	3%
2009	3,207	517	3,724	3,513	211	6%
2010	2,947	521	3,468	3,302	166	5%

[a] Includes Russian River Well Field and Groundwater Wells.
[b] UAF = Unaccounted For Water.

Projected Water Demands through 2035 are shown in Table ES-3. As discussed in Chapter 3 and Appendix E, the potable water values shown in Table ES-3 are based on the Decision Support System (DSS) model developed originally for the 2005 UWMP and updated for this 2010 UWMP Update.

Table ES-3. Total Water Use[a], AFY (DWR Table 11)

Water Use	2010	2015	2020	2025	2030	2035
Total Water Deliveries[a]	3,302	4,668	4,811	5,039	5,318	5,583
Sales to other Water agencies[b]	0	0	0	0	0	0
Additional Water Uses[c]						
Recycled Water[c]	1,546	1,902	2,345	2,476	2,541	2,671
Unaccounted-for System Losses[c]	166	351	362	378	400	420
Total Potable Water Use	3,468	5,019	5,173	5,417	5,718	6,003
Total Recycled Water Use	1,546	1,902	2,345	2,476	2,541	2,671
Total Water Use	5,014	6,921	7,518	7,893	8,259	8,674

[a] Sum of Tables 3-5 through 3-8.
[b] No sales to other agencies are anticipated.
[c] Table 3-9

Recycled water projections are based on the analysis detailed in Chapter 5 and include all recycled water use. The projected volume of recycled water that would result in an offset of current potable water use is expected to be approximately 55 AFY by the Year 2020, as indicated in Chapter 7.

As described in Appendix F, on April 6, 2011 Town Council posted Resolution 2777-11 that adopted SBx7-7 Method 3 for determining the Town's compliance targets. The Method 3 2020 compliance target of 130 gallons per capita per day (gpcd) is based on 95 percent of the hydrologic region target per capita water demand presented in the Draft 20x2020 Water Conservation Plan (April 30, 2009). The 2015 interim compliance target is 143 gpcd. The resulting required water demand in 2020, based on the population projections shown in Table ES-2 and a target per capita water demand of 130 gpcd, are shown in Table ES-4.

Table ES-4. SBx7-7 Required Total Water Use[a], AFY

Water Use	2010[b]	2015	2020	2025	2030	2035
Total Potable Water Use	3,471	4,553	4,314	4,488	4,620	4,765

[a] The projected water deliveries assume compliance with SBx7-7 Method 3, using a target per capita water demand of 130 gpcd and the population projections shown in Table ES-2.
[b] Historical Use.

The development of the Town's General Plan Land Use has been primarily in the residential land use types in recent years during the housing boom of the late 1990's and early 2000's. To fulfill the General Plan and balance the residential sector with jobs-creating Commercial, Industrial, and Institutional (CII) Land Use Types, development emphasis for the near future through 2035 will be weighted more heavily towards the CII land use types. The Town's projected per capita water demand is expected to increase in accordance with the General Plan Land Use. None of the four DWR SBx7-7 Target Methods are appropriate for calculating per capita water demand for those utilities that project a disproportionate growth of the CII land use types.

It is the Town's intent to develop the data necessary to evaluate Method 2 and possibly Method 4 over the next five years and re-evaluate the use of SBx7-7 Method 3 to establish the Town's compliance target, during preparation of the Town's 2015 UWMP. Because the Town may adjust the Target per capita water demand in the 2015 UWMP, all projected potable water demands in this UWMP are based on the Maddaus projections.

SBx7-7 also provides that urban water retail suppliers may plan, comply and report on the 2015 and 2020 water use targets on a regional basis, individual basis, or both. Pursuant to this, the Town has formed a regional alliance consisting of the following urban water suppliers: Cities of Santa Rosa, Rohnert Park, Sonoma, Cotati, and Petaluma, Town of Windsor, and North Marin, Marin Municipal and Valley of the Moon Water Districts, all of whom are contractors with the same wholesale water supplier, the Agency. Upon evaluation, the Water Contractors have selected Option 1 as described in DWR Methodologies for calculating the regional alliance target.

The regional alliance interim 2015 and 2020 water use targets are as follows:

- Interim 2015 water use target = 142 gpcd
- 2020 water use target = 129 gpcd

The signed regional alliance Town resolution and Memorandum of Understanding is included in Appendix F.

ES.4 WATER SUPPLY

The Town's potable and non-potable water demands are satisfied using the following water supply sources:

1. the Russian River Project via the Agency's transmission system and the Town's Russian River Well Field;
2. a local (off–river groundwater) well that is currently out of service; and,
3. recycled water.

Chapter 4 describes the surface water and groundwater sources, quantities, supply constraints, and the reliability and water quality of the water supply sources.

The Town's Russian River Project water supply entitlement is 4,725 AF through the Town's Russian River Well Field plus 900 AF intended to serve the Airport Outside service area, delivered through the Agency's Aqueduct, for a total surface water entitlement of 5,625 AF per year. The Agency has indicated that it would provide up to 5,200 AF per year starting in 2025.

Over the next few years, the Town intends to construct groundwater wells to provide summer supply peaking and to supplement Dry Year water supplies, thereby increasing the Town's water supply reliability. By 2025, the groundwater production will be required to serve Normal Year water demands if the Town does not receive its full Russian River Project entitlement.

Table ES-5 summarizes projected Normal Year water supplies available to the Town.

Table ES-5. Current and Planned Water Supplies (DWR Table 16)

Water Supply Sources	2010[a]	2015	2020	2025	2030	2035
Russian River Well Field and Sonoma County Water Agency Aqueduct[b]	3,468	5,006	5,118	5,200	5,200	5,200
Supplier produced groundwater	0	0	0	162	300	300
Transfers In or Out	0	0	0	0	0	0
Exchanges In or Out	0	0	0	0	0	0
Future Recycled Water[c]	0	13	55	55	55	55
Water Conservation – Future Savings[d]	0	396	635	796	911	1,016
Desalination	0	0	0	0	0	0
Other Water Supply Sources[e]	0	0	0	0	163	448
Total	3,468	5,415	5,808	6,213	6,629	7,019

(a) Values for 2010 are historical.
(b) From Sonoma County Water Agency. The two surface water supply facilities draw from the Sonoma County Water Agency's water rights and operation of the Russian River Project.
(c) Based on correspondence from Town staff to Sonoma County Water Agency. Projected expansion of the recycled water program for potable water offset includes: Existing Caletti Irrigation Accounts, Bell Village, Windsor Mill, and Airport Area (Phase 1). See Chapter 5 for a description of the Town's entire Recycled Water Program.
(d) Based on Maddaus Analysis and includes Plumbing Code, New Development Offset, Tier 1, and 50 percent of Tier 2.
(e) This increment of water would be a maximum of 23 AF in 2035 if the Town were to receive its full water right allotment of 5,625 AF in 2035. The remaining water supply could come from a variety of sources: future urban recycled water use, additional off river water supply, increased conservation, or the Agency supplies which may be available to meet Town demands. A discussion of the increased conservation measures is included in Chapter 6.

Although the water supply sources for the category of Other Water Supply Sources have not yet been identified, the Town would not experience a water supply shortage during the planning period to 2030 if the Town were able to receive the full Russian River Project water supply entitlement. By 2035, the Town would need to develop 23 AF of new water supply. This remaining water supply could come from a variety of sources: future urban recycled water use, additional off-river water supply, increased conservation, or increased Agency supplies.

ES.5 RECYCLED WATER

The Town owns and operates a wastewater treatment system which produces and supplies disinfected tertiary reclaimed water. The reclamation system includes a Water Reclamation Plant, recycled water storage ponds, discharge to Mark West Creek, agricultural irrigation and urban uses, and will soon (2011) include delivery to the Geysers Geothermal Project. The Town's water reclamation permits enable it to provide recycled water for irrigation of rural pasture, crops and vineyards and for non-potable use on in-Town parks, playgrounds, and commercial and residential landscaping.

The projected annual volume of wastewater collected, treated, and available for recycled water use is shown in Table ES-6. All wastewater treated at the Town's facility is treated to disinfected tertiary standards.

Table ES-6. Projected Wastewater Collected and Treated (DWR Table 21)

Year	2005	2010	2015	2020	2025	2030	2035
Average Dry Weather Flow, mgd[a]	1.57	1.37	1.72	1.75	1.80	1.86	1.93
Average Annual Flow, mgd[b]	2.2	2.2	2.25	2.27	2.36	2.44	2.52
Total Projected Effluent Volume, MGY[c]	788	792	820	830	860	890	920
Total Projected Volume Available for Local Reuse, MGY[d]	307	312	367	373	384	396	411
Total Projected Recycled Water Delivery to Geysers Geothermal Project, MGY[e]	—	—	193	274	274	274	274
Total Projected Volume Available for Reuse, MGY	307	312	560	647	657	670	685
Total Projected Volume Available for Reuse, AFY	942	957	1,719	1,985	2,018	2,057	2,103
Remaining Volume for Discharge or Other Use, MGY[f]	502	430	260	183	203	220	235
Remaining Volume for Discharge or Other Use, AFY[f]	1,541	1,320	798	562	622	674	721

Source: Town of Windsor May 2011.

[a] Based on ADWF increasing at the same rate as water use projections.
[b] ADWF times peaking factor of 1.31 based on Water Balance Model Influent Flow See Table 5-2 and text.
[c] Based on Town's sewer system Water Balance Model, except for 2005 and 2010 which are based on historical data (Table 5-2). All treated water meets disinfected tertiary criteria.
[d] Based on values and ratios developed in the 2005 UWMP. See text for discussion.
[e] Based on Geysers agreement of 0.53 mgd to Geysers in 2015 and 0.75 mgd to Geysers in 2020-2035.
[f] Total Effluent Volume minus Total Projected Volume Available for Reuse.

Approximately 1,550 AF of recycled water was used in the Town in 2010, approximately 957 AF was delivered to recycled water customers and the remainder was conveyed to Town spray fields for disposal. Some of the specific recycled water uses include:

- Irrigation of Windsor High School's athletic fields and landscaping,
- Flush water for Windsor High School's and Fire Station's toilets and urinals,
- Landscape irrigation of new homes located in the Vintage Greens 470-unit subdivision which have been built with a dual-pipe system,
- Windsor Golf Course,
- Town parks,
- Commercial Irrigation, and
- Irrigation of vineyards and pasture.

The projected recycled water delivery volume by land use type, including deliveries to the Geysers Geothermal Project, are shown in Table ES-7.

Table ES-7. Projected Future Use of Recycled Water in Service Area, AFY (DWR Table 23)

Type of Use	Description	Feasibility	2010[a]	2015[b]	2020	2025	2030	2035
Agricultural Irrigation[c]	Irrigation for vineyards	Expected to Continue	410	375	375	375	375	375
Landscape Irrigation[d]	Residential common areas and Parks	Expected to Continue	318	170	177	190	205	223
Commercial Irrigation[d]	Commercial turf and non-potable indoor use	Expected to Continue	509	271	284	304	328	356
Golf Course Irrigation	Existing use to continue	Expected to continue	309	309	309	309	309	309
Wildlife Habitat	No plans at this time	Not feasible	—	—	—	—	—	—
Wetlands	No plans at this time	Not feasible	—	—	—	—	—	—
Industrial reuse	No plans at this time	Not feasible	—	—	—	—	—	—
Groundwater Recharge	No plans at this time	Not feasible	—	—	—	—	—	—
Seawater barrier	No seawater intrusion	Not feasible	—	—	—	—	—	—
Geothermal/Energy[e]	Water delivery to Geysers Pipeline for steam field recharge	Expected to begin in mid-2011	—	594	840	840	840	840
Indirect Potable Reuse	No plans at this time	Not Feasible	—	—	—	—	—	—
Total			1,546	1,719	1,985	2,018	2,057	2,103

[a] Based on historical deliveries.
[b] Based on projected deliveries, quantity delivered for Agricultural Irrigation, Landscape Irrigation, and Commercial Irrigation are shown to be less in 2015 than in 2010 because actual deliveries in 2010 exceeded the amount projected in the 2001 Water Reclamation Master Plan.
[c] A portion of Agricultural use is expected to offset groundwater pumping.
[d] A portion of Urban landscape use is expected to offset potable water demand.
[e] The Geysers agreement between the Town and City of Santa Rosa specifies three annual flow rates for the Windsor Pump Station: 0.53 mgd, 0.75 mgd, and 1.25 mgd, corresponding to 594 AFY, 840 AFY, and 1,400 AFY, respectively.

ES.6 WATER CONSERVATION

The Town is 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 Regarding Urban Water Conservation (MOU). As signatory to the MOU, the Town has pledged their good faith effort towards implementing BMPs identified in the CUWCC MOU. The two primary purposes of the MOU are:

1. to expedite implementation of reasonable water conservation measures in urban areas, and
2. 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 Town signed the CUWCC MOU on August 9, 1999, and submits annual BMP reports to the CUWCC in accordance with the MOU. The MOU requires that a water utility implement only the BMPs that are economically feasible. If a BMP is not economically feasible, the utility may request an economic exemption for that BMP. The Town has not requested economic exemption from any of the BMPs at this time.

Urban water suppliers that are members of the CUWCC may submit their most recent BMP Annual Reports for reporting years 2009-2010 to meet the requirements of DWR Water Code Section 10631 (f). The Town is currently implementing, or planning to implement, all 14 DMMs. The level of implementation is described below.

The water demand projections presented in Chapter 3 were developed based on certain assumptions regarding the future implementation of water conservation measures, or BMPs. The Town's CUWCC BMPs are currently in various stages of completion. Water conservation measures that are not part of the CUWCC BMPs are also assumed to be implemented for this analysis. These measures are identified as Tier 2 BMPs. New development standards that focus on low water using requirements for new single family housing are also assumed. These assumed future water conservation activities were integrated with the current water use characteristics and the population growth projections using the DSS model.

The water demand projections assume that approximately half of the water savings from Tier 2 BMPs and 100 percent of savings from the new development standards would occur.

The projected water conservation savings are shown in Table ES-8.

Table ES-8. Estimated Water Conservation Program Savings, AFY

Water Use	2015	2020	2025	2030	2035
Conservation Savings[(a)]	396	635	796	912	1,016

[(a)] Total projected savings including new plumbing codes, Tier 1, New Development standards, and 50 percent of Tier 2.

ES.7 WATER SUPPLY VERSUS DEMAND COMPARISON

A comparison of the projected normal year water supply available to the Town and customer demands from 2015 through 2035, in five-year increments, is shown in Table ES-9.

Table ES-9. Projected Normal Water Supply and Demand Comparison, AFY (DWR Table 32)

	2015	2020	2025	2030	2035
Agency Aqueduct and Russian River Well Field Supply[a]	5,006	5,118	5,200	5,200	5,200
Local Groundwater[a]	—	—	162	300	300
Potable Water Offset with Recycled Water Expansion[a]	13	55	55	55	55
Supply Totals	5,019	5,173	5,417	5,555	5,555
Demand Totals[b]	5,019	5,173	5,417	5,718	6,003
Difference/Other Water Supply Sources[a]	0	0	0	162	448
Difference as a percent of Supply	0	0	0	-3	-8
Difference as a percent of Demand	0	0	0	-3	-7

[a] See Table ES-5.
[b] See Table ES-3. Includes savings due to water conservation program shown in Table ES-8.

As shown in Table ES-9, the Town has sufficient water supplies through 2025 to meet Normal Year water demands. However, a supply deficit of approximately 162 AFY is projected in 2030, increasing to about 450 AFY in 2035. Over the next several years the Town will be evaluating a variety of sources including: future urban recycled water use, additional off river water supply, aquifer storage and recovery wells, increased conservation, and additional Agency supplies to help meet the Town's projected water demands. It should also be noted that the Town's existing water entitlement under the existing Restructured Agreement with the Agency states the Town's water supply is 5,625 AFY. Therefore, if the Town were to receive its full entitlement from the Agency in 2035, only a 25 AFY deficiency would exist.

A discussion of the increased conservation measures is included in Chapter 6.

A comparison of the projected single dry year water supply available to the Town and customer demands from 2010 through 2035, in five-year increments, is shown in Table ES-10.

Table ES-10. Supply and Demand Comparison – Single Dry Year, AFY (DWR Table 33)

	2015	2020	2025	2030	2035
Agency Aqueduct and Russian River Well Field Supply[a]	3,504	3,583	3,640	3,640	3,640
Local Groundwater[a]	600	600	600	600	600
Potable Water Offset with Recycled Water Expansion[a]	13	55	55	55	55
Supply Totals	4,117	4,238	4,295	4,295	4,295
Required Percent Demand Reduction From Normal Year[b]	18	18	21	25	29
Demand Totals[b]	4,117	4,238	4,295	4,295	4,295
Difference/ Other Water Supply Sources	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0

[a] See Table 4-4 and Table 4-5. As indicated by the Agency, Single Dry Year water deliveries are assumed to be 70 percent of Normal Year water deliveries. Local Groundwater deliveries during single dry years are assumed to be at 50 percent of the total installed capacity.

[b] Assumes a Water Shortage Emergency Stage 3 would be declared, which provides for reduction in water demands of 25 to 50 percent. See Water Shortage Contingency Plan Table 1. These data assume a 30 percent reduction in Agency supply would trigger a corresponding 18-28 percent reduction in demand, assuming increased groundwater pumping.

A comparison of the projected multiple dry year water supply available to the Town and customer demands from 2010 through 2035, in five-year increments, is shown in Table ES-11.

Table ES-11. Supply and Demand Comparison – Multiple Dry Year, AFY (DWR Table 34)

		3-Year Dry Period Beginning				
		2015	2020	2025	2030	2035
Multiple-dry year first year supply	Supply Totals[a]	5,019	5,173	5,417	5,555	5,555
	Demand Totals	5,019	5,173	5,417	5,718	6,003
	Difference	0	0	0	-163	-448
	Difference as % of Supply	0	0	0	-3	-8
	Difference as % of Demand	0	0	0	-3	-7
Multiple-dry year second year supply	Supply Totals[a]	5,019	5,173	5,417	5,555	5,555
	Demand Totals	5,019	5,173	5,417	5,718	6,003
	Difference	0	0	0	-163	-448
	Difference as % of Supply	0	0	0	-3	-8
	Difference as % of Demand	0	0	0	-3	-7
Multiple-dry year third year supply	Supply Totals[a]	5,019	5,173	5,417	5,555	5,555
	Demand Totals	5,019	5,173	5,417	5,718	6,003
	Difference	0	0	0	-163	-448
	Difference as % of Supply	0	0	0	-3	-8
	Difference as % of Demand	0	0	0	-3	-7

[a] As indicated in Tables 7-5 and 7-6, and in the text, the Multiple Dry Year water supplies are projected to be the same as the Normal Year water supplies, based on information provided to the Town by the Agency.

CHAPTER 1
Introduction

This Urban Water Management Plan (UWMP or Plan) addresses the Town of Windsor (Town) water system and includes a description of the water supply sources, historical and projected water use, and a comparison of water supply to water demands during normal, single-dry, and multiple-dry years. The Town receives the majority of its water from the Russian River Well Field under the Sonoma County Water Agency's (Agency's) water rights with additional supplies delivered directly from the Agency to a service area known as the Airport Outside Service Area.

This section provides background information on the Plan, an overview of coordination with other agencies, and a description of public participation and Plan adoption.

1.1 URBAN WATER MANAGEMENT PLANNING ACT

This Plan has been prepared in accordance with the Urban Water Management Act (Act), as amended, California Water Code, Sections 10610 through 10657. The Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections, or supplying more than 3,000 AF of water annually, to adopt and submit a plan every five years to the California Department of Water Resources (DWR). This Plan serves as a long-range planning document for the Town's water supply and supply reliability. The Agency's urban water management plan should be consulted for details regarding the Agency's water supplies and supply reliability (Sonoma County Water Agency, 2011).

In 2010, the Town supplied 3,468 AF of potable water and 1,545 AF of recycled water to approximately 9,200 customers in the Town and surrounding areas within the Town's service area, but located in unincorporated areas of Sonoma County. Therefore the Town is subject to the requirements of the Urban Water Management Planning Act. The Town prepared its first UWMP in 1990; the UWMP was then updated in 1995, 2000, and 2005.

1.2 RESOURCE MAXIMIZATION AND IMPORT MINIMIZATION

Water management tools have been used by the Town to maximize water resources. The Town has been participating with the Agency in the implementation of water conservation measures. Additionally, the Town is participating in funding a groundwater basin study being conducted in Sonoma County by the Agency, other groundwater basin municipal users, and the United States Geological Survey (USGS).

1.3 COORDINATION

The Act requires the Town to 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. The Town coordinated the preparation of its Plan with its wholesale water supplier, the Agency, and eight nearby water utilities that also utilize Agency water and the Santa Rosa Subregional Reclamation System. In addition, the Town coordinated the preparation of the water demand projections in this Plan with the Association of Bay Area Government's (ABAG) demographic projections and Windsor's General Plan. Table 1-1 provides a summary of the Town's coordination with the appropriate agencies.

Table 1-1. Coordination with Appropriate Agencies (DWR Table 1)

	County Agencies		Wastewater Agency Facilities	Other	
	Sonoma County	Sonoma County Water Agency	Santa Rosa Subregional Reclamation System	Coordination with Neighboring Utilities	Public Involvement
Participated in developing the Plan		✓	✓		✓
Commented on the draft		✓	✓		
Attended public meetings		✓	✓		✓
Was contacted for assistance	✓	✓	✓		
Was sent a copy of the draft Plan	✓	✓	✓		✓
Was sent a notice of intention to adopt	✓		✓		✓
Not involved/No information					

1.4 PUBLIC PARTICIPATION AND PLAN ADOPTION

The Town encouraged community and public interest involvement in the Plan update through public hearings and review/comment of the draft document. Public hearing notifications were published in the Windsor Times. A copy of the published Notice of Public Hearing is included in Appendix B. The public hearing on June 15, 2011 provided an opportunity for all residents and employees in the service area to learn and ask questions about their water supply and the Town's plans for providing a reliable, safe, high-quality water supply. Copies of the draft Plan were made available for public inspection at the Town's Public Works office and Town Hall.

This Plan was adopted by the Town Council on June 15, 2011. A copy of the adopted resolution is provided in Appendix B. The Town will submit the updated UWMP to the Department of Water Resources Sonoma County, and the California State Library within 30 days after its adoption, as required by Section 10644 of the UWMP Act. This updated UWMP contains information required by the UWMP Act, which is necessary to plan for the efficient use of urban water supplies within the Town's service area. Prior to its adoption, the updated UWMP was reviewed by the Town's Council and the public. The adopted UWMP will be made available for public review within 60 days after submission of the adopted UWMP.

In accordance with the requirements of SBx7-7, Water Code section 10608.26, a public hearing was held in on April 6, 2011 to discuss and receive public comments on the Town's proposed per capita water use targets for 2015 and 2020. At this Town Council meeting, after receiving public input/comments, the Council adopted staff's recommendation to move forward with using Method 3, the Hydrologic Region Methodology to establish the Town's interim 2015 and final 2020 gpcd target goals (see Appendix F for more details).

The Town is committed to the implementation of the programs discussed in this 2010 UWMP. In particular, the Town will implement the conservation programs outlined in the Town's Conservation Plan (as summarized in Chapter 6) to reduce per capita water use and meet the Town's SBx7-7 per capita water use targets for 2015 and 2020.

1.5 PLAN ORGANIZATION

The UWMP is organized into the following sections:

- Chapter 2 Description of Existing Water System – provides a description of the service area, climate, water supply facilities, and distribution system
- Chapter 3 Historical and Projected Water Use – presents historical and projected water use
- Chapter 4 Water Supply – describes surface and groundwater supplies
- Chapter 5 Recycled Water – describes recycled water
- Chapter 6 Water Conservation – addresses water conservation
- Chapter 7 Water Supply versus Demand Comparison – provides a comparison of future water supply to demand.

Appendices to this UWMP include:

- Appendix A – Legislative Requirements
  - California Water Code Division 6 Part 2.6. Urban Water Management Planning
  - Senate Bill No. 7 – Chapter 4
  - Department of Housing and Community Development Division of Housing Policy Development Memorandum – Senate Bill 1087, Legislation Effective January 1, 2006: Water and Sewer Service Priority for Housing Affordable to Lower-Income Households
- Appendix B – Notice of Public Hearing and Resolution to Adopt this Updated UWMP
- Appendix C – Town/SCWA Water Supply Contracts and Agreements
  - Restructured Agreement for Water Supply
  - Memorandum of Understanding Regarding Water Transmission System Capacity Allocation During Temporary Impairment
  - Agreement for the Sale of Water Between the Sonoma County Water Agency and the Windsor Water District
  - Second Amendment to Agreement Regarding Ownership, Maintenance, and Operation of Certain Water Transmission Facilities at the Sonoma County Airport in Service of Properties Located Westerly of Highway No. 101 and Northerly of Mark West Creek
- Appendix D – Town's Water Conservation and Drought Management Ordinances

- Appendix E – 2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update (Maddaus Water Management, November 2010)
- Appendix F – Senate Billx7-7
  - — Compliance with the Water Conservation Act of 2009 (Senate Billx7-7) Technical Memorandum (West Yost, April 2011)
  - — Resolution Adopting Water Conservation Act Year 2015 (Interim) and Year 2020 Water Use Targets
  - — Letter Agreement Establishing a Regional Alliance to Comply with SBx7-7 the Water Conservation Act of 2009)
- Appendix G – Town's 2009/10 Best Management Practices Report Filing to the California Urban Water Conservation Council (CUWCC)
- Appendix H – Town's Water Shortage Contingency Plan
- Appendix I – UWMP Checklist

1.6 GLOSSARY OF TERMS AND ABBREVIATIONS

The following terms and acronyms have been used throughout this UWMP 2010 Update to improve document clarity and readability.

ABAG	Association of Bay Area Governments
ADWF	Average dry weather flow
AF	Acre-feet
AFY	acre-feet per year
BMPs	Best Management Practices
CEQA	California Environmental Quality Act
CCF	One hundred cubic feet
CIMIS	California Irrigation Management Information System
CUWCC	California Urban Water Conservation Council
DMMs	Demand Management Measures; fourteen water conservation measures included in the UWMP Act
DWR	California Department of Water Resources
ETo	Evapotranspiration
gpcd	Gallons per capita per day
M&I	Municipal and Industrial
MCLs	Maximum Contaminant Levels
MCLGs	Maximum Contaminant Level Goals
mgd	Million gallons per day
Maddaus	Maddaus Water Management

Natural Yield	The yield of the groundwater basin as a result of natural inflow and recharge; does not include artificial recharge
PHGs	Public Health Goals
RWTF	Recycled Water Treatment Facilities; includes MFUV and SFUV facilities
SCWA or Agency	Sonoma County Water Agency
SWP	State Water Project
SWRCB	State Water Resources Control Board
UAF	Unaccounted for water – Water which is used but not accounted for or billed; usually associated with metering inaccuracies and unmetered main flushing activities
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act; enacted in 1983; establishes requirements for a UWMP
West Yost	West Yost Associates; preparer of this UWMP

The Town of Windsor was incorporated in 1992. Prior to 1984, the Town (as the Windsor Water District) produced all of its potable water from local groundwater supply wells, including the Bluebird well. Beginning in 1984, the Russian River Well Field was constructed and began pumping water for use by the Water District's customers. In 1985, a connection to the Sonoma County Water Agency (SCWA) aqueduct was completed to provide water to the Sonoma County Airport and the Airport Industrial Area, and this area became part of the Town's water service area.

To reduce the demand for potable water, the Town has committed to participate in water conservation and recycling activities. The Town became a member of the California Urban Water Conservation Council (CUWCC) when its Town Council officially adopted the Memorandum of Understanding Regarding Urban Water Conservation in California on August 9, 1999. The Town is currently implementing the fourteen Best Management Practices (BMPs) outlined in that Memorandum of Understanding, which correspond to the fourteen Demand Management Measures (DMMs) outlined in the UWMP Act. Further discussion of these conservation efforts is provided in Chapter 6 of this UWMP.

In addition to encouraging water conservation, the Town promotes water recycling and is a member of the WateReuse Association. The Town's mission is to provide a safe, reliable, and consistent supply of recycled water, and to maximize the amount of recycled water delivered. The Town has constructed recycled water treatment and distribution facilities and augments its water supply with recycled water for non-potable landscape irrigation use at numerous sites in the Town and surrounding area. As new areas are developed, recycled water treatment, storage and distribution facilities will be further expanded to serve non-potable landscaping demands in these areas. Further discussion of the Town's recycled water efforts is provided in Chapter 5 of this UWMP.

This chapter describes the Town's service area, climate, and water supply facilities.

2.1 DESCRIPTION OF SERVICE AREA AND CUSTOMER TYPES

The Town's water system serves the Town of Windsor and several adjacent areas. Located along Highway 101 in central Sonoma County, approximately seven miles north of the City of Santa Rosa, the water system boundary consists of the town limits of Windsor, plus two service areas located outside the Town's boundary that are served by "outside service agreements:" the Airport Service Area and the Shiloh and Mayacama Service Areas. The Town provides potable water to a total population (Inside and Outside of Town limits) of approximately 26,158 people. The entire population of the Town is not served by the Town's potable water system, however, as there are several older developments and mobile home parks operating and maintaining their own private well systems. Although this number is dropping and therefore as these wells fail and/or regulatory requirements become too burdensome more of these residences currently served by in-Town private wells will become Town water system customers. Figure 2-1 illustrates the location of the Town's various service areas and water supply facilities. The Town also provides water through direct connections to the Sonoma County Water Agency aqueduct to eight customers on Slusser Road, west of the Sonoma County Airport.

The Town currently supplies potable water to approximately 9,000 residential, commercial, construction, and landscape irrigation customers (service connections) in the Town and surrounding areas. The Town also supplies recycled water to customers within the Town boundary and in Sonoma County.

As shown in Table 2-1, the Town's potable water customer connections are primarily residential, with about 88 percent of the Town's customers being residential (single family and multi-family); about 5 percent being commercial; and 7 percent being irrigation, firelines or construction.

Table 2-1. Summary of Town's Water System Customer Types[(a)]

Customer Type	Number of Meters	Percent of Total Meters
Single Family Residential	7,832	87
Multi-Family Residential	74	1
Commercial	482	5
Irrigation	374	4
Other (Firelines, Construction)	275	3
Total	9,037	100

(a) Source: Town of Windsor, Number of Meters as of July 2010.

In addition to water service, the Town provides wastewater collection and treatment services within the Town. The Town owns and operates a wastewater treatment plant on Windsor Road that has a capacity of 2.25 million gallons per day (mgd), although discharge and permitting issues limit the average dry weather flow capacity to 1.9 mgd. The Town does not provide wastewater collection and treatment services to the Outside Service Areas. The Shiloh Outside Service Area is served by onsite wastewater treatment systems (septic systems) and the Airport and Mayacama Outside Service areas are served by separate wastewater collection and treatment systems that are owned by the Agency.

2.2 CLIMATE

The Town's climate is tempered by its proximity to the Pacific Ocean. In common with much of the California coastal area, the year is divided into wet and dry seasons. A majority 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 29.6 inches. Table 2-2 summarizes average monthly evapotransporation rates (ETo), rainfall, and temperatures.

Table 2-2. Climate (DWR Table 3)

Month	Standard Average ETo[a], inches	Average Rainfall[b], inches	Average Temperature[b], ºF
January	0.88	6.44	47.23
February	1.55	5.26	51.27
March	2.99	3.89	53.56
April	4.53	1.83	56.56
May	5.46	0.69	61.48
June	6.47	0.25	67.07
July	6.53	0.03	70.10
August	5.87	0.11	69.80
September	4.36	0.31	68.06
October	3.24	1.58	62.23
November	1.37	4.03	53.14
December	0.96	5.20	47.33
Annual	44.21	29.63	58.95

[a] Data represents the monthly average from August 1999 to September 2005 and was recorded from Windsor CIMIS Station 103. ETo, or evapotranspiration, is the loss of water from evaporation and transpiration from plants.
[b] 1952-2005 data recorded at Sonoma Station from NOAA website www.wrcc.dri.edu

2.3 WATER SUPPLY FACILITIES

The Town has three water supply sources: the Russian River Well Field, the Agency transmission system, and one off-river groundwater well, called the Bluebird Well, which is currently out of service. A map of the Town's existing water system that depicts the locations of storage tanks, groundwater wells, and pumping stations is presented on Figure 2-1.

2.3.1 Agency Water System Facilities

The Town receives its surface water supply from the Agency's Santa Rosa Aqueduct. The Agency's main water supply is provided by diversions of water from the Russian River. The Agency supplements the Russian River supply with water from groundwater wells located in the Santa Rosa Plain. The Agency's urban water management plan should be consulted for details regarding the Agency's water supply. A description of the supply quantity and quality is included in Chapter 4.

The Agency water is delivered though a connection to the 36-inch diameter Santa Rosa Aqueduct. The town connects into the Santa Rosa Aqueduct through a 12-inch diameter water main located adjacent to Laughlin Road in the southern portion of the Airport Outside Service Area. The Agency has been supplying water to the Town since 1985, when the Town agreed to be responsible for supplying water to the Sonoma County Airport and the Airport Industrial Area.

2.3.2 Russian River Well Field

The Russian River Well Field is located on a 27-acre parcel northwest of the Windsor River Road/Eastside Road intersection. The well field, which has been in operation since 1984, currently contains five production wells with capacities of approximately 1,300 gallons per minute (gpm) each. These wells intercept underflow from the Russian River. The production from the Russian River Well Field is limited under terms of an agreement with the Agency that allows the Town to divert water under the Agency's water rights permit issued by the State Water Resources Control Board (SWRCB). The Town may divert up to 4,725 acre-feet per year (AFY) at a maximum rate of 7.2 mgd over 30 days from the well field. The agreement with the Agency extends to 2014, including provisions for a 40-year renewal at no greater quantities.

2.3.3 Groundwater Facilities

The Town also has three local or "off-river" groundwater wells. The Bluebird Well is a 400-foot deep well located at the end of Bluebird Court in Windsor. Constructed in 1972, it had been placed on standby in the mid-1980s when the Russian River Well Field was developed, but had subsequently been used as an off-river supply source to improve system reliability. In 2006, the Bluebird well once more was taken off-line because of water quality concerns. The groundwater contained an arsenic concentration greater than 10 parts per billion (ppb), which exceeds the State's lowered arsenic maximum contaminant level of 10 ppb. The Town also owns the Esposti Park Well and Keiser Park wells which are primarily used for park irrigation, as well as serving as a backup or emergency source of potable water. Table 2-3 summarizes the Town's well data.

Table 2-3. Windsor Groundwater Well Data

Site	Well No.	Capacity, gpm	Status
Russian River Well Field (RRWF)[(a)]	7	1,285	On-line
RRWF[(a)]	8	1,285	On-line
RRWF[(a)]	9	1,300	On-line
RRWF[(a)]	10	1,300	On-line
RRWF[(a)]	11	1,300	On-line
Bluebird Well	3	400	Off-line
Esposti Park Well	N/A	200	Standby
Keiser Park Well	N/A	150	Standby

[(a)] Source: E-mail from RMC, November 13, 2010.

2.4 DISTRIBUTION SYSTEM

The Town's water system has several storage tanks and pumping station facilities. The pumping stations are located in and serve the Shiloh and Mayacama service areas.

2.4.1 Storage

The Town has five million gallons (MG) of storage tank capacity to serve its primary pressure zone. A 1 MG tank and a 2 MG tank (Lakewood Hills 1 and 2) are located in the northeastern part of the Town, two 1 MG tanks (Shiloh Ridge 1 and 2) are located off of Shiloh Ridge Road in the hills east of the Town. Additionally, three small pressure zones supply homes in the hills to the southeast of Windsor in the Shiloh Estates and Mayacama subdivisions. These subdivisions are located in unincorporated areas and are provided water service by the Town through outside service area agreements. The design characteristics of the reservoirs are summarized in Table 2-4. There are no wells or storage tanks serving the Airport Service Area.

Table 2-4. Characteristics of Storage Reservoirs

Name	Zone Serviced	Tanks No. – Capacity
Lakewood Hill Tank Site	1 (main pressure zone)	One - 1 MG tank, One - 2 MG tank
Shiloh Ridge	1 (main pressure zone)	Two -1 MG tanks
Shiloh 1	2 (lower Shiloh OSA)	Four - 10,500 gallon tanks
Shiloh 2	3 (middle Shiloh OSA)	Three - 10,500 gallon tanks
Shiloh 3	4 (middle Shiloh OSA)	Three - 10,500 gallon tanks
Shiloh 4	4 (middle Shiloh OSA)	100,000 gallon tank
Mayacama Tank	Mayacama pressure zone	220,000 gallon tank

Source: E-mail from RMC November 13, 2010.

OSA = Outside Service Area

2.4.2 Pump Stations

The Town operates four pump stations all located in the Shiloh Estates subdivision in the hills to the east of the Town. Characteristics of these stations are presented in Table 2-5.

Table 2-5. Characteristics of Booster Pump Stations

Name	Zone serviced	Capacity, gpm[(a)]
Shiloh Ridge	2 (lower Shiloh OSA)	2 @ 270 each
Shiloh 1	3 (middle Shiloh OSA)	2 @ 250 each
Shiloh 2	4 (highest Shiloh OSA)	2 @ 100 each
Vinecrest Pump Station	5 (higher Vinecrest Circle)	2 @ 280 total

Source: E-mail from RMC November 13, 2010.

(a) Each pump station has one duty and one standby pump

2.4.3 Distribution Pipelines

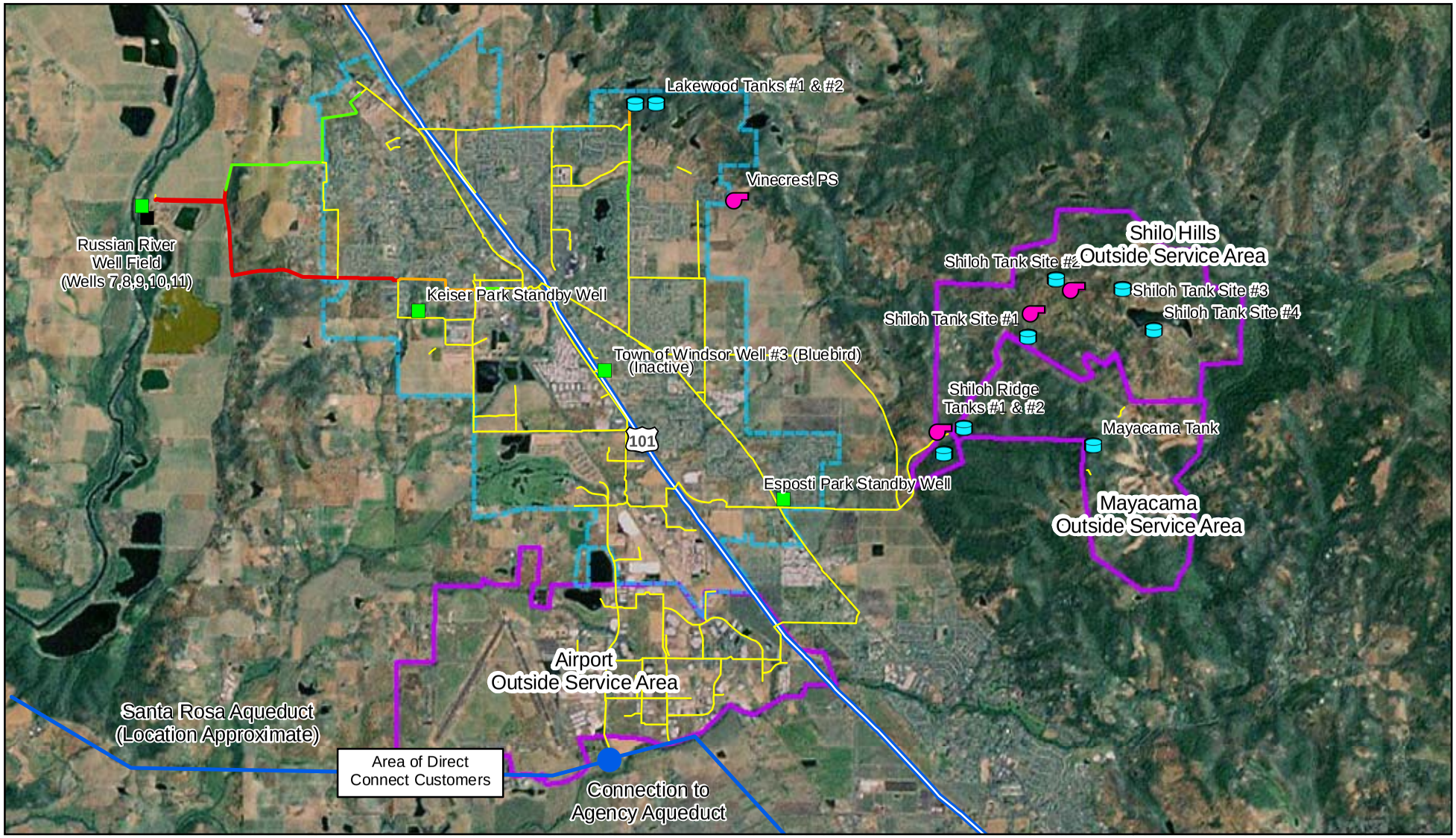
The Town's distribution system consists of almost 120 miles of pipe ranging in diameters from 4 to 18 inches, as shown in Table 2-6. The majority of the pipelines have been installed in the last 20 years and are in excellent condition.

Table 2-6. Characteristics of Distribution Pipelines

Diameter, inches	Total Installed Length, feet
4	1,432
6	97,850
8	303,442
10	5,244
12	190,206
14	16,566
16	3,040
18	13,348
Total	631,128

Source: E-mail from RMC November 13, 2010

Larger diameter pipelines (12-inch diameter and greater) are also shown on Figure 2-1.



LEGEND

- Well
- Booster Pump Station
- Storage Tank
- Treatment Facility
- Connection
- 12-inch diameter pipeline
- 14-inch diameter pipeline
- 16-inch diameter pipeline
- 18-inch diameter pipeline
- Windsor SOI
- Outside Service Area

N

0 2,500 5,000

Scale in Feet

FIGURE 2-1

Town of Windsor
Urban Water Management Plan

WATER SUPPLY AND TRANSMISSION FACILITIES

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\722 Town of Windsor\02-10-03 2010 Urban Water Mngt Plan Update\GIS\Figures\FIG2-1_Facilities.mxd 5/13/2011

This chapter presents information regarding demographics and projections of future Town water demands. A more detailed analysis of water use characteristics and projected population and water demands is presented in Appendix E.

3.1 EMPLOYMENT, LAND USE, AND POPULATION

This section describes the Town's employment and land use characteristics, and current and projected future population for the Town's service area.

3.1.1 Employment Characteristics

The employment characteristics of the Town's service area are primarily in the public sector and in the service and manufacturing industries. Regionally, employment in the agricultural industry is related to vineyards, livestock, orchards, silage crops, and timber. The primary industrial activities in the region include telecommunications, wine production, timber and other agricultural product processing, gravel mining and processing, energy production, and miscellaneous manufacturing. Recreation and tourism are moderate and growing industries in the region.

3.1.2 Land Use Characteristics

Land use within the Town is primarily residential, but also includes agricultural, industrial, commercial, and recreational land uses. Sonoma County, by policy, concentrates urban growth within incorporated cities and towns, not in the unincorporated area. Sonoma County has a voter-approved County-wide urban growth boundary and each city/town has an urban growth boundary. There are voter-approved taxes supporting open space acquisition in all of Sonoma County.

3.1.3 Population Projections

Population and employment projections were developed for the Town. The population and employment forecasts are based on the projections developed by the Association of Bay Area Governments (ABAG). The population projections are described in the analysis performed by Maddaus Water Management, which is presented in Appendix E. Table 3-1 provides current and projected population through the year 2035 for the Town's entire water service area.

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

Year	2010	2015	2020	2025	2030	2035
Population Outside Town Limits[(a)]	934	1,115	1,115	1,115	1,115	1,115
Population Inside Town Limits[(b)]	25,224	28,400	29,600	30,800	31,700	32,700
Total Service Area Population	26,158	29,515	30,715	31,915	32,815	33,815

(a) Estimated based on current estimates of outside service area population plus the addition of 61 mobile homes in 2011.
(b) Estimated based on Association of Bay Area Governments (ABAG) projections, as reported in the 2010 UWMP Water Demand Analysis and Water Conservation Measures Update (Maddaus November 18, 2010) Appendix E.

The Maddaus Analysis used the ABAG population projections for the Town to represent the projection for the Total Service Area Population. Town staff has indicated a concern about using the ABAG future population growth estimates to represent the Town's service area population for two primary reasons:

1. Until recently, the number of residences *outside* Town limits that *are* served by the Town's potable water system are approximately the same as the number of residences *inside* Town limits that *are not* served by the Town water system. This has changed in recent years as these private water supply sources for the residences inside Town limits fail and the residences request and are approved to connect to the Town's potable water system, increasing the actual number of customers served by the Town's water system.
2. The Town has little to no control over the development of the areas outside Town limits (in Sonoma County); the County Airport Service Area, the Shiloh Outside Service Area, and the Mayacamas Outside Service Area. It is possible that multi-family housing, for example, may be constructed in one of these Outside Service Areas, which could impact the estimated population growth estimates or further increase water demand estimates due to commercial and industrial growth (which would actually increase the per capita water use as the population in this area would remain fixed, but the water demand would increase).

At present, the ABAG population projections are the only data available and must therefore be used.

3.2 HISTORICAL AND FUTURE WATER USE

This section outlines water use in the Town by customer type, water sales to other agencies, additional water use, and past and projected water use. The demand projections reflect average weather conditions and do not reflect dry, hot, non-drought conditions when water demands might be greater than average with no drought restrictions in place. The Town plans to supplement Agency supply with its own groundwater supplies as discussed in Chapter 4, Section 4.2, of this Plan to meet consumptive needs during hot dry periods that do not also have drought conditions. The detailed water demand analysis and demand projections are presented in the evaluations performed by Maddaus Water Management, which are presented in Appendix E. The water demand projection process consisted of projecting future demographics, evaluating historical water use characteristics, defining alternative levels of water conservation efforts, and developing resulting water demand projections. The projections include consideration of the impacts of the plumbing code and Town's current and future water conservation efforts.

The historical water use analysis consisted of evaluating the monthly water use per account for each customer category over a 10-year period. The analysis resulted in a weather normalized annual water use per account type, expressed as gallons per day per account. The demographic projections, water use characteristics, and alternative conservation efforts were integrated using Maddaus's Decision Support System (DSS) model to develop resulting demand projections.

3.2.1 Historical Water Use by Customer Type and Unaccounted For Water

Water uses in the Town's service area include single-family, multi-family, business, commercial, irrigation, and institutional customers. The number of customer connections and the volume of water delivered from 2000 through 2010 are shown in Table 3-2. Industrial and Institutional water use is included in the Commercial Water Use Sector. The "Other" water use sector includes *metered* fire line water, construction water, and other minor uses.

Table 3-2. Ten-Year Water Deliveries 2000-2010[(a)]

					Water Use Sectors			
			Single-Family	Multi-Family	Commercial	Irrigation	Other	Total
2000	metered	# of accounts	6,601	57	471	263	308	7,700
		Deliveries AFY	2762	77	493	492	71	3895
2001	metered	# of accounts	7,000	57	504	284	242	8,087
		Deliveries AFY	2,884	80	548	570	55	4,136
2002	metered	# of accounts	7,202	57	538	300	279	8,376
		Deliveries AFY	2,988	102	575	565	57	4,287
2003	metered	# of accounts	7,500	57	576	318	321	8,772
		Deliveries AFY	2,826	94	505	555	60	4,040
2004	metered	# of accounts	7,683	57	622	325	265	8,952
		Deliveries AFY	2,982	102	540	637	51	4,312
2005	metered	# of accounts	7,559	55	402	343	338	8,697
		Deliveries AFY	2,784	87	558	546	62	4,038
2006	metered	# of accounts	7,881	56	433	357	336	9,063
		Deliveries AFY	2,877	87	580	650	29	4,224
2007	metered	# of accounts	7,861	57	438	360	302	9,018
		Deliveries AFY	2,903	115	621	657	29	4,325
2008	metered	# of accounts	7,834	66	457	374	280	9,011
		Deliveries AFY	2,834	115	651	713	19	4,332
2009	metered	# of accounts	8,011	74	470	374	278	9,207
		Deliveries AFY	2,396	120	502	468	26	3,513
2010	metered	# of accounts	7,832	74	482	374	275	9,037
		Deliveries AFY	2,390	180	546	421	9	3,302

Source: Town of Windsor

[(a)] Based on historical data

Unaccounted-for water use is unmetered water use, such as that used for *unmetered* fire hydrant use and training, system and street flushing, sewer cleaning, construction, system leaks, as well as that used by unauthorized connections. Unaccounted-for water use can also result from meter inaccuracies. The historical amount of unaccounted for water over the past 11 years is shown in Table 3-3.

Table 3-3. Historical Water Production and Demand, 2000-2010

Year	Water Production, AF			Used Total, AF	UAF[b], AF	UAF, Percent
	Wells[a]	Purchased	Total			
2000	3,835	320	4,155	3,895	260	6%
2001	4,035	370	4,405	4,136	269	6%
2002	3,760	635	4,394	4,287	107	2%
2003	3,648	478	4,126	4,040	86	2%
2004	4,134	333	4,466	4,312	147	3%
2005	3,726	441	4,167	4,038	131	3%
2006	3,820	628	4,448	4,224	224	5%
2007	3,889	528	4,418	4,325	36	2%
2008	3,957	509	4,467	4,332	135	3%
2009	3,207	517	3,724	3,513	211	6%
2010	2,947	521	3,468	3,302	166	5%

[a] Includes Russian River Well Field and Groundwater Wells.
[b] UAF = Unaccounted For Water.

Based on the historical data, and allowing for some distribution system deterioration in the future, the Town has selected a projected unaccounted for water demand of 7 percent of total water supplied to be used in the water demand projections.

3.2.2 Recent Historical and Projected Metered Water Demands

The recent historical and projected number of connections and deliveries to the Town's customers by user sector, in 5-year increments are presented in Table 3-4 through 3-8. The projected water deliveries are based on the findings of the Maddaus Study, and an assumed unaccounted for water demand of 7 percent of total water produced. The Maddaus study estimated water demand and potential water conservation savings for several levels of water conservation. The level of water conservation selected by the Town is:

- Plumbing Code,
- New Development Offsets,
- Tier 1, and
- 50 percent of Tier 2.

The levels of water conservation are described in Appendix E.

Table 3-4. Water Deliveries – Actual, 2005[a] (DWR Table 3)

Water Use Sectors	2005				
	Metered		Not Metered		
	# of Accounts	Volume, AF	# of Accounts	Volume, AF	Total Volume, AF
Single-Family	7,559	2,784	—	—	2,784
Multi-Family	55	87	—	—	87
Commercial	402	558	—	—	558
Irrigation	343	546	—	—	546
Other	338	62	—	—	62
Total	8,697	4,038	—	—	4,038

[a] Based on historical data

Table 3-5. Water Deliveries – Actual, 2010[a] (DWR Table 4)

Water Use Sectors	2010				
	Metered		Not Metered		
	# of Accounts	Volume, AF	# of Accounts	Volume, AF	Total Volume, AF
Single-Family	7,832	2,227	—	—	2,227
Multi-Family[b]	74	165	—	—	165
Commercial	482	529	—	—	529
Irrigation	374	373	—	—	373
Other	275	9	—	—	9
Total	9,037	3,302	—	—	3,302

[a] Based on historical data. This level of water use is significantly below that which would be typical/normal due to several prior years of drought conditions and the economic recession, and cool summer weather.
[b] The recent addition of the Vineyard Creek Apartments in the Airport Outside Service Area increased water demands for Multi-family residential. This water demand was projected to be a commercial water demand in Tables 3-6 through 3-8.

Table 3-6. Water Deliveries – Projected, 2015[a] (DWR Table 5)

Water Use Sectors	2015				
	Metered		Not Metered		
	# of Accounts[b]	Volume, AF	# of Accounts[b]	Volume, AF	Total Volume, AF
Single-Family	8,386	3,081	—	—	3,081
Multi-Family[c]	61	78	—	—	78
Commercial	521	614	—	—	614
Irrigation	444	793	—	—	793
Other	375	102	—	—	102
Total	9,786	4,668	—	—	4,668

[a] The projected water use is based on the findings of the Maddaus Water Management Report, November 2010, assuming Plumbing Code, New Development Offsets, Tier 1, and 50 percent of Tier 2 water conservation. Projections do not include unaccounted for water, which is projected to be 7 percent of the total water production.
[b] Projected number of accounts is based on Maddaus Water Management Report, November 2010.
[c] The recent addition of the Vineyard Creek Apartments in the Airport Outside Service Area increased water demands for Multi-family residential. This water demand was projected to be a commercial water demand in Tables 3-6 through 3-8.

Table 3-7. Water Deliveries – Projected, 2020[a] (DWR Table 6)

Water Use Sectors	2020				
	Metered		Not Metered		
	# of Accounts[b]	Volume, AF	# of Accounts[b]	Volume, AF	Total Volume, AF
Single-Family	8,740	3,064	—	—	3,064
Multi-Family[c]	64	77	—	—	77
Commercial	596	678	—	—	678
Irrigation	508	887	—	—	887
Other	391	105	—	—	105
Total	10,299	4,811	—	—	4,811

[a] The projected water use is based on the findings of the Maddaus Water Management Report, November 2010, assuming Plumbing Code, New Development Offsets, Tier 1, and 50 percent of Tier 2 water conservation. Projections do not include unaccounted for water, which is projected to be 7 percent of the total water production.
[b] Projected number of accounts is based on Maddaus Water Management Report, November 2010.
[c] The recent addition of the Vineyard Creek Apartments in the Airport Outside Service Area increased water demands for Multi-family residential. This water demand was projected to be a commercial water demand in Tables 3-6 through 3-8.

Table 3-8. Water Deliveries – Projected, 2025, 2030, and 2035[a] (DWR Table 7)

Water Use Sectors	2025		2030		2035	
	Metered		Metered		Metered	
	# of Accounts[b]	Volume, AF	# of Accounts[b]	Volume, AF	# of Accounts[b]	Volume, AF
Single-Family	9,094	3,100	9,360	3,136	9,655	3,191
Multi-Family[c]	66	75	68	75	70	76
Commercial	675	756	772	858	855	944
Irrigation	576	999	658	1138	729	1,257
Other	407	109	419	111	432	115
Total	10,819	5,039	11,277	5,318	11,741	5,583

[a] The projected water use is based on the findings of the Maddaus Water Management Report, November 2010, assuming Plumbing Code, New Development Offsets, Tier 1, and 50 percent of Tier 2 water conservation. Projections do not include unaccounted for water, which is projected to be 7 percent of the total water production.
[b] Projected number of accounts is based on Maddaus Water Management Report, November 2010.
[c] The recent addition of the Vineyard Creek Apartments in the Airport Outside Service Area increased water demands for Multi-family residential. This water demand was projected to be a commercial water demand in Tables 3-6 through 3-8.

3.2.3 Unaccounted-for Water and Additional Water Use

The projected quantity of unaccounted-for system water losses for the next 25 years, in 5-year increments is shown in Table 3-9.

Table 3-9. Additional Water Uses and Losses, AFY (DWR Table 10)

Water Use	2010[a]	2015	2020	2025	2030	2035
Saline Barriers	0	0	0	0	0	0
Groundwater Recharge	0	0	0	0	0	0
Conjunctive Use	0	0	0	0	0	0
Raw Water	0	0	0	0	0	0
Recycled Water[b]	1,546	1,902	2,345	2,476	2,541	2,671
Unaccounted-for System Losses (7%)	166	351	362	378	400	420
Other	0	0	0	0	0	0
Total	1,600	2,253	2,707	2,854	2,941	3,091

[a] Based on historical data.
[b] Recycled water use is discussed in Chapter 5.

At this time, the Town does not use water for groundwater recharge to prevent salt water intrusion (saline barriers) or for any other uses shown in Table 3-9, although some water loss is projected.

3.2.4 Total Projected Water Use

The resulting projected water demand, based on the sum of the metered water demand projections in Table 3-5 through Table 3-8, and the unaccounted for water estimate in Table 3-9, is shown in Table 3-10.

Table 3-10. Total Water Use[a], AFY (DWR Table 11)

Water Use	2010	2015	2020	2025	2030	2035
Total water deliveries[a]	3,302	4,668	4,811	5,039	5,318	5,583
Sales to other Water agencies[b]	0	0	0	0	0	0
Additional Water Uses[c]						
Recycled Water[c]	1,546	1,902	2,345	2,476	2,541	2,671
Unaccounted-for System Losses[c]	166	351	362	378	400	420
Total Potable Water Use	3,468	5,019	5,173	5,417	5,718	6,003
Total Recycled Water Use	1,546	1,902	2,345	2,476	2,541	2,671
Total Water Use	5,014	6,921	7,518	7,893	8,259	8,674

[a] Sum of Tables 3-5 through 3-8.
[b] No sales to other agencies are anticipated.
[c] Table 3-9

3.2.5 Water Sales to Other Agencies

The Town does not currently sell water to other agencies (DWR Table 9).

3.2.6 Projected Water Demand of Lower Income Households

As indicated in Senate Bill 1087 (SB 1087), the projected water demand of future lower income households must be included in the UWMP.

Lower income household is defined by California Health and Safety Code Section 50079.5 as 80 percent or less of the area median income (AMI), adjusted for family size and revised annually. According to the Town's Regional Housing Needs Allocation for January 1, 2009 through June 30, 2014, the Town needs 328 new housing units for Very Low (0-50% of AMI) and Low (51%-80% of AMI).

The calculated, current water demand of the Town's existing lower income households (329 multi-family dwelling units and 70 single family dwelling units) is 159 AFY. The historical unit water demands from January 2003 through October 2010 are shown in Table 3-11.

Table 3-11. Estimated Lower Income Household Water Demand, January 2003 through October 2010

Dwelling Unit Type	Unit Water Demand, AFY/Dwelling Unit
Multi-Family Common Area Irrigation	0.10
Multi-Family Indoor Water Use	0.29
Single Family	0.44

Based on the unit water demands shown in Table 3-11, the projected water demand of the required 328 additional lower income household dwelling units ranges from 128 AFY (multi-family dwelling units) to 144 AFY (single family dwelling units). This additional estimated demand, plus the existing demand of 159 AFY, sums to the projected water demand shown in Table 3-12.

Table 3-12. Low-Income Projected Metered Water Demands, AFY (DWR Table 8)

Year	Projected Low (Based on 100% Multi-Family Residential Indoor Water Use)	Projected High (based on 100% Single Family Residential)
2010[(a)]	159	159
2015	287	303
2020[(b)]	287	303
2025	287	303
2030	287	303
2035	287	303

(a) Estimated Current Metered Water Demand
(b) Residential Housing Needs Allocation projection does not extend beyond 2014.

3.3 DEMAND ON WHOLESALE SUPPLY

The projected amount of water that the Agency expects to provide to the Town for purchase from the Agency's Santa Rosa Aqueduct and the Town's Russian River Well field under the Agency's water rights is shown in Table 3-13. The remaining demand will be met with some combination of any or all of the following supply sources: Town's own groundwater wells, water conservation implementation, aquifer storage and recovery wells, additional Agency supplies, and recycled water. The Agency's water supply, the Town's groundwater and recycled water supply are further described in Chapter 4. The Town's water conservation implementation is further described in Chapter 6.

Water use in 2010 is not representative of normal water use characteristics for the Sonoma County Water Agency (Water Agency) and its customers (Water Contractors). From 2007 – 2010, the Water Agency and the Water Contractors water use was significantly affected by a number of factors including drought conditions, implementation of water shortage response plans, economic recession and increases in residential and commercial vacancy. Lasting effects

of the drought, water shortage and economic recession, as well as a cool summer, significantly decreased the Water Agency and Water Contractors' 2010 actual water use and is not representative of normal water use characteristics.

Table 3-13. Town Demand Projections to Wholesale Suppliers, AFY (DWR Table 12)

Water Use	Contracted Volume	2010	2015	2020	2025	2030	2035
Sonoma County Water Agency	5,625[a]	3,468[b]	5,019	5,173	5,417	5,718	6,003

[a] Current contractual entitlement under the Restructured Agreement for Water Supply
[b] Historical delivery.

The methodology used by the Water Agency and Water Contractors to estimate the demand projections for 2015 through 2035 are based on normal water use characteristics and do not incorporate the effects of the conditions described above. Because of this methodology, the 2015 water demand projection, in particular, may be higher than what may actually occur. Due to the uncertainty regarding economic recovery, a demand range of 4,306 AFY to 5,006 AFY for 2015 has been provided. If the economic recovery is slower than expected, the lower end of the demand projection range, 4,306 AFY, may be more likely to occur in 2015. If the economic recovery is strong, the higher end of the demand projection, 5,006 AFY as shown in Table 3-13 may be more likely to occur in 2015. The Water Contractors will be coordinating and working closely with the Water Agency to determine the timing of capital improvement projects that may need to come online in order to meet the water demand in response to the economy recovery.

3.4 ANALYSIS OF SBX 7-7 WATER DEMAND PROJECTIONS

A complete analysis of the SBx7-7 water demand projections is presented in Appendix F. Base year data are presented below. The base period ranges for the 10- to 15-year base period, and the 5-year base period are shown in Table 3-14.

Table 3-14. Base Period Ranges (DWR Table 13)

Base	Parameter	Value	Units
10- to 15-Year Base Period	2008 total water deliveries	4,467	AF
	2008 total volume of delivered recycled water	695	AF
	2008 recycled water as a percent of total deliveries	15.6	Percent
	Number of Years in Base period	10	Years
	Year beginning base period range	1999	
	Year ending base period range	2008	
5-Year Base Period	Number of Years in Base Period	5	Years
	Year beginning base period range	2003	
	Year ending base period range	2007	

Note: See Appendix F for detailed analysis.

The 10-year Base Daily Per Capita Water Use is shown in Table 3-15.

Table 3-15. Base Daily Per Capita Water Use – 10- to 15-year Range (DWR Table 14)

(1)	(2)	(3)	(4)	(5)
Base Years	Service Area Population	Gross Water Use, gpd	Daily Per Capita Water Use (3) ÷ (2), gpcd	10-year Running Average Daily Per Capita Water Use Ending Between 2004 and 2010, gpcd
1999	21,719	3,443,159	159	
2000	22,529	3,709,293	165	
2001	23,553	3,932,841	167	
2002	24,130	3,922,926	163	
2003	24,425	3,683,715	151	
2004	24,867	3,987,336	160	
2005	25,359	3,720,147	147	
2006	25,889	3,971,151	153	
2007	26,280	3,943,838	150	
2008	26,471	3,987,481	151	156
2009	26,714	3,324,681	124	153
2010	26,955	3,096,031	115	148
10-Year Base Daily Per Capita Water Use Ending in 2008, gpcd				156
Indicates the 10-year period used to calculate the 10-year base daily per capita water use				

The 5-year Base Daily Per Capita Water Use is shown in Table 3-16.

Table 3-16. Base Daily Per Capita Water Use – 5-year Range (DWR Table 15)

(1)	(2)	(3)	(4)	(5)
Base Years	Service Area Population	Gross Water Use, gpd	Daily Per Capita Water Use (3) ÷ (2), gpcd	10-year Running Average Daily Per Capita Water Use Ending Between 2004 and 2010, gpcd
2003	24,425	3,683,715	151	
2004	24,867	3,987,336	160	
2005	25,359	3,720,147	147	
2006	25,889	3,971,151	153	
2007	26,280	3,943,838	150	152
2008	26,471	3,987,481	151	152
2009	26,714	3,324,681	124	145
2010	26,955	3,096,031	115	139
5-Year Base Daily Per Capita Water Use Ending in 2007, gpcd				152
Indicates the 5-year period used to calculate the 5-year base daily per capita water use				

As described in Appendix F, on April 6, 2011 Town Council posted Resolution 2777-11 that adopted SBx7-7 Method 3 for determining the Town's compliance targets. The Method 3 2020 compliance target of 130 gallons per capita per day (gpcd) is based on 95 percent of the hydrologic region target per capita water demand presented in the Draft 20x2020 Water Conservation Plan (April 30, 2009). The 2015 interim compliance target is 143 gpcd. The resulting required water demand in 2010, based on the population projections shown in Table 3-1 and a target per capita water demand of 130 gpcd, are shown in Table 3-17.

Table 3-17. SBx7-7 Required Total Water Use[(a)], AFY

Water Use	2010[(b)]	2015	2020	2025	2030	2035
Total Potable Water Use	3,471	4,553	4,314	4,488	4,620	4,765

(a) The projected water deliveries assume compliance with SBx7-7 Method 3, using a target per capita water demand of 130 gpcd and the population projections shown in Table 3-1.
(b) Historical Use.

The development of the Town's General Plan Land Use has been primarily in the residential land use types in recent years during the housing boom of the late 1990's and early 2000's. To fulfill the General Plan and balance the residential sector with jobs-creating Commercial, Industrial, and Institutional (CII) Land Use Types, development emphasis for the near future through 2035 will be weighted more heavily towards the CII land use types. The Town's projected per capita water demand is expected to increase in accordance with the General Plan Land Use. None of the four DWR SBx7-7 Target Methods are appropriate for calculating per capita water demand for those utilities that project a disproportionate growth of the CII land use types.

It is the Town's intent to develop the data necessary to evaluate Method 2 and possibly Method 4 over the next five years and re-evaluate the use of SBx7-7 Method 3 to establish the Town's compliance target, during preparation of the Town's 2015 UWMP. Because the Town may adjust the Target per capita water demand in the 2015 UWMP, all projected potable water demands in this UWMP are based on the Maddaus projections.

SBx7-7 also provides that urban water retail suppliers may plan, comply and report on the 2015 and 2020 water use targets on a regional basis, individual basis, or both. Pursuant to this, the Town has formed a regional alliance consisting of the following urban water suppliers: Cities of Santa Rosa, Rohnert Park, Sonoma, Cotati, and Petaluma, Town of Windsor, and North Marin, Marin Municipal and Valley of the Moon Water Districts, all of whom are contractors with the same wholesale water supplier, the Agency. Upon evaluation, the Water Contractors have selected Option 1 as described in DWR Methodologies for calculating the regional alliance target.

The regional alliance interim 2015 and 2020 water use targets are as follows:

- Interim 2015 water use target = 142 gpcd
- 2020 water use target = 129 gpcd

The signed regional alliance Town resolution and Memorandum of Understanding is included in Appendix F.

The Town will report its progress in meeting the established 2015 and 2020 per capita water use targets in the 2015 and 2020 UWMP Updates.

Water from the Agency's transmission system, the Town's Russian River Well Field, a local (off–river groundwater) well that is currently out of service, and recycled water are used to meet the Town's water demand. This chapter describes the surface water and groundwater sources, quantities, supply constraints, and the reliability and water quality of the water supply sources. Because the Town's Recycled Water Program is both a wastewater disposal program and a potable water offset program, only the projected future potable water offset is included in this Chapter. The entire Recycled Water Program is described in Chapter 5 – Recycled Water.

4.1 AGENCY SURFACE WATER

This section briefly describes the physical constraints to the Agency's surface water supply and the legal background and constraints to this supply. As described in Chapter 2, the Agency obtains its surface water from the Russian River. More detailed information regarding the Agency's water supply and facilities can be found in the Agency's 2010 Urban Water Management Plan.

4.1.1 Description

The Town receives its water supply from both water delivered by the Agency through the Santa Rosa Aqueduct and water diverted by the Town through facilities owned by the Town under the Agency's State Water Rights. The Agency is supplied by the Federal Russian River Project, which it operates along with the Agency's appurtenant water transmission system. The Coyote Valley Dam, which creates Lake Mendocino on the East Fork Russian River and Warm Springs Dam, which creates Lake Sonoma on Dry Creek (a tributary to the Russian River), are the key elements of the Russian River Project. Water from the Russian River is diverted by the Agency near the Town of Forestville and conveyed via its transmission system (including diversion facilities, chlorination and corrosion control facilities, pipelines, water storage tanks, booster pump stations, and groundwater wells) to its wholesale customers, including the Town. Further detail on the Town's water supply facilities and distribution system is included in Chapter 2.

4.1.2 Physical Constraints

While the capacity of the Agency's water conveyance system to deliver water to the Town is constrained, particularly during high demand periods in the summer months, this constraint is more of a legal constraint than a physical one, as discussed below. The impact and resolution of the physical constraint is addressed by the Memorandum of Understanding, also described below under Legal Constraints. Future water supply projections are dependent upon planned infrastructure improvements being approved and constructed.

4.1.3 Legal Constraints

The Agency's Russian River water supply is controlled and influenced by a variety of agreements and decisions. The Agency's 2010 Urban Water Management Plan should be consulted for details regarding these agreements and decisions. This section of the plan describes the issues that influence the Town's water supply.

4.1.3.1 Water Rights

Four State Water Resources Control Board (SWRCB) permits (SWRCB Permit Numbers 12947A, 12949, 12950, and 16596) currently authorize the Agency to store up to 122,500 AFY of water in Lake Mendocino and up to 245,000 AFY of water in Lake Sonoma, and to divert and redivert 180 cubic feet per second (cfs) of water from the Russian River at the Agency's Wohler and Mirabel facilities, up to 75,000 AFY. The Agency had applied to the SWRCB to increase the Agency's Russian River diversion limit from 75,000 to 101,000 AFY, but the Agency is currently not pursuing that application.

4.1.3.2 Restructured Agreement for Water Supply

The Restructured Agreement for Water Supply (Restructured Agreement), which was executed in 2006, generally provides for the finance, construction, and operation of existing and new diversion facilities, transmission lines, storage tanks, booster pumps, conventional wells, and appurtenant facilities. The Restructured Agreement provides the contractual relationship between the Agency and its eight contractors, including the Town, and includes specific maximum amounts of water that the Agency is obligated to supply to its water contractors. Maximum water allocations for each of the Agency's water contractors set forth within the Restructured Agreement were premised on the Agency's diversion/rediversion water rights being increased to 101,000 AFY and on the construction of the new facilities authorized by the Restructured Agreement. The water allocation for the Town under the Restructured Agreement is 4,725 AFY with a maximum month delivery rate of 7.2 mgd to serve the Town proper, and 900 AFY with a maximum month delivery rate of 1.5 mgd through transmission system deliveries to the Airport Service Area, for a total supply of 5,625 AFY from the Agency. Chapter 3, Section 3.5 of the Restructured Agreement also provides a specific methodology for allocating water among these parties during periods of shortage.

4.1.3.3 Memorandum of Understanding Regarding Water Transmission System Capacity Allocation during Temporary Impairment

The maximum delivery allocations in the Restructured Agreement assume the construction of certain additional facilities and approval by the SWRCB of increased Agency diversion from the Russian River up to 101,000 AFY. Existing transmission system constraints and the Agency's decision to delay pursuit of the SWRCB application have necessitated the development of an additional agreement to govern maximum water allocations during the summer months. The Memorandum of Understanding Regarding Water Transmission System Capacity Allocation During Temporary Impairment (Temporary Impairment MOU) was in effect between the Agency and its primary customers, including the Town, until September 30, 2008, although the provisions were applied in 2009. The Temporary Impairment MOU allocates the existing 92 mgd of transmission system capacity among the parties during the "summer months" of June through September. While the Town receives delivery of Agency water both directly from the Town's Russian River Wellfield and from the Agency's Aqueduct system, the main transmission/conveyance system restriction of concern is further upstream along Dry Creek, impacting all Russian River water deliveries.

On April 18, 2006, the Agency's Board of Directors adopted Resolution No. 06-0342, which approved a water allocation methodology developed by the Agency and its water contractors, which was essentially based on the principals established under Section 3.5 of the Restructured Agreement. One factor prompting Resolution No. 06-0342 was to provide a water shortage allocation methodology that ensures retail water providers that have aggressive conservation programs are not penalized by the use of "percentage reduction from historic consumption" to determine shortage allocations, and to not create a disincentive from future conservation savings.

4.1.3.4 Town Water Rights

Water from the Russian River Well Field is pumped under an agreement established in 1991 with the Agency and a water rights permit issued by the SWRCB that allows the Town to divert up to 4,725 AFY at a maximum rate (*i.e.*, average rate over 30 days) of 7.2 mgd. The agreement, which includes a term of 23 years, includes provisions that allow for a 40-year renewal with no greater quantities. The Town's diversion falls under the Agency water right permits. The Town applied for an independent surface water right with the SWRCB for diversion of Russian River Well Field (or "Russian River underflow," as referenced in the SWRCB water rights permit), which is considered a water supply with hydrologic connection to the Russian River surface water (Donaldson Associates, 2000; SWRCB Water Rights Information Management System, 2005). The Town continues to pursue the independent surface water right and the application is still pending as of this 2010 UWMP Update.

The Agency projections that quantify water availability to the Town through 2030 are presented in Table 4-1.

Table 4-1. Wholesaler Supplies – Existing and Planned Sources of Water, AFY (DWR Table 17)

Wholesaler Sources	2010	2015	2020	2025	2030	2035
Sonoma County Water Agency – Russian River Well Field and Aqueduct	3,468	5,006	5,118	5,200	5,200	5,200

Source: 2010 delivery is based on historical delivery. 2015 through 2035 data were provided by water wholesaler (Sonoma County Water Agency).

4.2 GROUNDWATER

This section provides a description of the Town's groundwater supply as well as the physical and legal constraints of this supply. For the purposes of this plan, the Town's Russian River Well Field is not considered groundwater, because it taps underflow of the Russian River and is a surface water right. The groundwater supply facilities are described in Chapter 2.

4.2.1 Description

The groundwater basin underlying the Town is the Santa Rosa Plain, a subbasin (DWR number 155.01) of the Santa Rosa Valley Basin (DWR, 2003). The Santa Rosa Plain drains northwest toward the Russian River, and is thus part of the North Coast Hydrologic Region. The groundwater basins are illustrated on Figure 4-1.

The Santa Rosa Plain Subbasin is the largest basin in the County and underlies the most populated areas of the County. In December 2005, the USGS and the Agency began a five-year comprehensive basin study similar to the studies that have been completed for the Alexander and Sonoma Valleys. This $1.975 million study is being funded by the Agency, City of Santa Rosa, City of Cotati, City of Rohnert Park, City of Sebastopol, Town of Windsor, County of Sonoma, the California American Water Company, and the USGS.

The objectives of the study are to: 1) develop an updated assessment of the geohydrology and geochemistry of the Santa Rosa Plain; 2) develop a multi-aquifer groundwater flow model for the Santa Rosa Plain; and 3) evaluate the hydrologic impacts of alternative groundwater management strategies for the basin. The study will provide hydrologic information that will assist the Agency, municipalities in the Santa Rosa Plain, and other management and regulatory agencies in better understanding the potential impacts of any increasing groundwater use on groundwater levels, stream-aquifer interaction, subsidence, and water quality. The study will consider several priority USGS water-resource issues including surface water and groundwater interactions, effects of urbanization on water resources, and hydrologic-system management. The approach of the study will include: (1) data compilation, utilizing a Geographic Information System (GIS); (2) new data collection, focusing on water-quality sampling; (3) data interpretation and geohydrologic characterization, including refining hydrologic budgets and updating conceptual models of the groundwater flow system based on the new data and the results of ongoing USGS geologic studies in the basin; and (4) simulation of groundwater flow in the Santa Rosa Plain.

The geology of the Santa Rosa Plain Subbasin is complex and the stratigraphic relationships are the subject of recent and continuing studies, including mapping by the USGS and others (USGS, 2002). The subbasin is cut by many northwest-trending faults that influence groundwater flow. Most of the groundwater is unconfined, but in some locations can be confined where folding and faulting exists (DWR, 2003). The water-bearing deposits underlying the basin include the Wilson Grove Formation, the Glen Ellen Formation, and a younger and older alluvium (DWR, 2003).

The Wilson Grove Formation is the major water-bearing unit in the western part of the basin and ranges in thickness from 300 feet to 1,500 feet (Winzler and Kelly, 2005; DWR, 2003). Deposited during the Pliocene, it is a marine deposit of fine sand and sandstone with thin interbeds of clay, silty-clay and some lenses of gravel. Interbedded and interfingered with the Wilson Grove Formation are Sonoma Volcanic sediments in the eastern basin separating the water-bearing units.

Aquifer continuity and water quality are generally good according to Cardwell, 1958, which is still the most detailed reference on the hydrogeology.

Quaternary deposits include stream-deposited alluvium, alluvial fan deposits, and basin deposits (Todd Engineering, 2004). The younger alluvium (Late Pleistocene to Holocene age) overlies the older alluvium (Late Pleistocene age). The alluvial deposits consist of poorly sorted sand and gravel and moderately sorted silt, fine sand, and clay. The upper and mid-portion of the alluvial fan deposits are on the eastern side of the Santa Rosa Plain and are permeable and provide recharge to the basin. The basin deposits overlie the alluvial fan materials and have a lower permeability (Todd Engineering, 2004; Cardwell, 1958).

A 1982 DWR study concluded that groundwater levels in the northeast part of the Santa Rosa Plain Subbasin had increased, while groundwater levels in the south had decreased (DWR, 1982). Groundwater storage capacity in the Santa Rosa Plain is estimated by the USGS to be 948,000 AF (Cardwell, 1958).

Natural recharge occurs east of Santa Rosa, primarily along stream beds, at the heads of alluvial fan areas, and in some parts of the Sonoma Volcanics. For the Santa Rosa Plain Subbasin, average annual natural recharge from 1960 to 1975 was estimated to be 29,300 AF and average annual pumping during the same time was estimated at 29,700 AF. Well yields range from 100 to 1,500 gpm (DWR, 2003).

DWR has not identified this basin to be in a critical condition of overdraft in Bulletin 118-80, nor is the basin adjudicated. There is currently no Groundwater Management Plan for the Santa Rosa Plain Groundwater Basin, although the USGS Study, referenced above, may result in a Groundwater Management Plan in the future.

The use of recycled water in the Santa Rosa subbasin offsets demand for potential potable use by agricultural operations. Recycled water use in the Santa Rosa subbasin has decreased somewhat over the years due to increased emphasis on irrigation efficiency and crop conversion to vineyards which have lower water requirements. The Santa Rosa Subregional Reclamation System provides recycled water for agricultural users and will continue to meet the needs of the current agricultural customers.

The DWR groundwater website (http://wdl.water.ca.gov/gw) has water level data for several wells in the Santa Rosa Plain in and near the Town. These monitoring data show stable or rising water levels since 1990. In its entirety, water level monitoring data indicate that the Town's well is reliable and there are no physical constraints on the groundwater supply other than the limited capacity of the Town's pumping facilities. The current USGS/Agency study will provide updated data and new tools that may affect groundwater management strategies for the Santa Rosa Plain Subbasin.

The amount of groundwater pumped in the last six years is shown in Table 4-2.

Table 4-2. Amount of Groundwater Pumped by the Town, AFY (DWR Table 18)

Basin Name(s)	2005	2006	2007	2008	2009	2010
Santa Rosa Plain Subbasin	200	0	0	0	0	0
Percent of Total Water Supply	4	0	0	0	0	0

The projected future production through 2035 is shown in Table 4-3. With the projected addition of groundwater wells in accordance with the 2009 draft Water Master Plan, the amount of groundwater pumped is estimated to increase to 300 AF by 2035.

Table 4-3. Amount of Groundwater Projected to be Pumped by the Town, AFY (DWR Table 19)					
Basin Name(s)	2015	2020	2025	2030	2035
Santa Rosa Plain Subbasin	0	0	162	300	300
Percent of Total Water Supply	0	0	2-3	4-5	4-5

The Town may construct groundwater production capacity prior to 2025 to increase supply reliability and provide for delivery to serve peak demands.

4.2.2 Physical Constraints

The Town currently does not have a groundwater well capable of providing potable water, but may add treatment to the existing Bluebird Well, and/or construct additional groundwater wells in the future.

4.2.3 Legal Constraints

There are no legal constraints on the Town's use of its groundwater supply.

4.3 DESALINATION

Desalinated water is not a viable option for the Town's water supply, because the ocean is not immediately adjacent to the Town and neither brackish nor impaired groundwater has been identified.

4.4 TRANSFER AND EXCHANGE OPPORTUNITIES

Currently, the Town does not transfer or exchange water with other entities. However, water transfers between the Agency's water contractors are authorized under the Restructured Agreement. Such transfers and exchanges between Agency water contractors have been necessary in the past and may be necessary in the future to improve water supply reliability. Nevertheless, no transfers or exchanges are projected for this Plan, as indicated in Table 4-4.

Table 4-4. Transfer and Exchange Opportunities (DWR Table 20)			
Transfer Agency	Transfer or Exchange	Short Term or Long Term	Proposed Volume
None	—	—	0
Total	—	—	0

As such, the Town does not foresee any opportunities to import water from other regions.

4.5 CURRENT AND PROJECTED WATER SUPPLIES

This section provides projections of the future water supply quantities available to the Town. Future water supplies from the Agency are dependent upon planned infrastructure improvements

being approved and constructed, which are described in the Agency's 2010 Urban Water Management Plan. Future projects that will contribute to the Town's local water supply are summarized in Table 4-5.

Table 4-5. Future Water Supply Projects (DWR Table 26)

Project Name	Projected Start Date	Projected Completion Date	Normal year AF to agency	Single-dry year yield, AF	Multiple-Dry Year		
					Year 1, AF	Year 2, AF	Year 3, AF
Off River Wells Water Supply – Phase 1[(a)]	2010	2012	200	400	200	200	200
Off-River Wells Water Supply – Phase 2[(b)]	2012	2015	100	200	100	100	100
Recycled Water Expansion[(c)]	2011	2020	55	55	55	55	55

(a) The Town proposes two replacement water supply wells. One well would replace the existing Bluebird Drive water supply well and a second well would replace the existing Esposti Park water supply well. The two wells are assumed to have an average capacity of 270 gpm and would be used to increase water supply reliability. These two wells are scheduled to be completed in the 2012 Capital Improvement Program year. Dry year water is based on pumping at 50 percent of capacity.

(b) The Town proposes to complete a new water supply well at Hiram Lewis Park and at the Russian River Well Field. The proposed Hiram Lewis Park well is assumed to have a capacity of 270 gpm. The proposed Russian River Well Field well is projected to have a capacity of 1,300 gpm, but pumping would comply with operation of the Russian River Project and would not increase the total water supply. Dry year water is based on pumping at 50 percent of capacity.

(c) Based on correspondence from Town staff to Sonoma County Water Agency. Projected expansion of the recycled water program for potable water offset includes: Existing Caletti Irrigation Accounts, Bell Village, Windsor Mill, and Airport Area (Phase 1). See Chapter 5 for a description of the Town's entire Recycled Water Program.

Table 4-6 summarizes projected water supplies available to the Town.

Table 4-6. Current and Planned Water Supplies (DWR Table 16)

Water Supply Sources	2010[(a)]	2015	2020	2025	2030	2035
Russian River Well Field and Sonoma County Water Agency Aqueduct[(b)]	3,468	5,006	5,118	5,200	5,200	5,200
Supplier produced groundwater[(c)]	0	0	0	162	300	300
Transfers In or Out	0	0	0	0	0	0
Exchanges In or Out	0	0	0	0	0	0
Future Recycled Water[(c)]	0	13	55	55	55	55
Water Conservation – Future Savings[(d)]	0	396	635	796	911	1,016
Desalination	0	0	0	0	0	0
Other Water Supply Sources[(e)]	0	0	0	0	163	448
Total	3,468	5,415	5,808	6,213	6,629	7,019

(a) Values for 2010 are historical.

(b) From Sonoma County Water Agency. The two surface water supply facilities draw from the Sonoma County Water Agency's water rights and operation of the Russian River Project.

(c) Based on correspondence from Town staff to Sonoma County Water Agency. Projected expansion of the recycled water program for potable water offset includes: Existing Caletti Irrigation Accounts, Bell Village, Windsor Mill, and Airport Area (Phase 1). See Chapter 5 for a description of the Town's entire Recycled Water Program.

(d) Based on Maddaus Analysis and includes Plumbing Code, New Development Offset, Tier 1, and 50 percent of Tier 2.

(e) This increment of water would be a maximum of 23 AF in 2035 if the Town were to receive its full water right allotment of 5,625 AF in 2035. The remaining water supply could come from a variety of sources: future urban recycled water use, additional off river water supply, increased conservation, or increased Agency supplies which may be available to meet Town demands. A discussion of the increased conservation measures is included in Chapter 6.

Although the water supply sources for the category of Other Water Supply Sources have not yet been identified, the Town would not experience a water supply shortage during the planning period to 2030 if the Town were able to receive the full Russian River Project water supply entitlement. By 2035, the Town would need to develop 23 AF of new water supply. This remaining water supply could come from a variety of sources: future urban recycled water use, additional off-river water supply, increased conservation, or increased Agency supplies.

The water supply reliability is discussed in Chapter 7.

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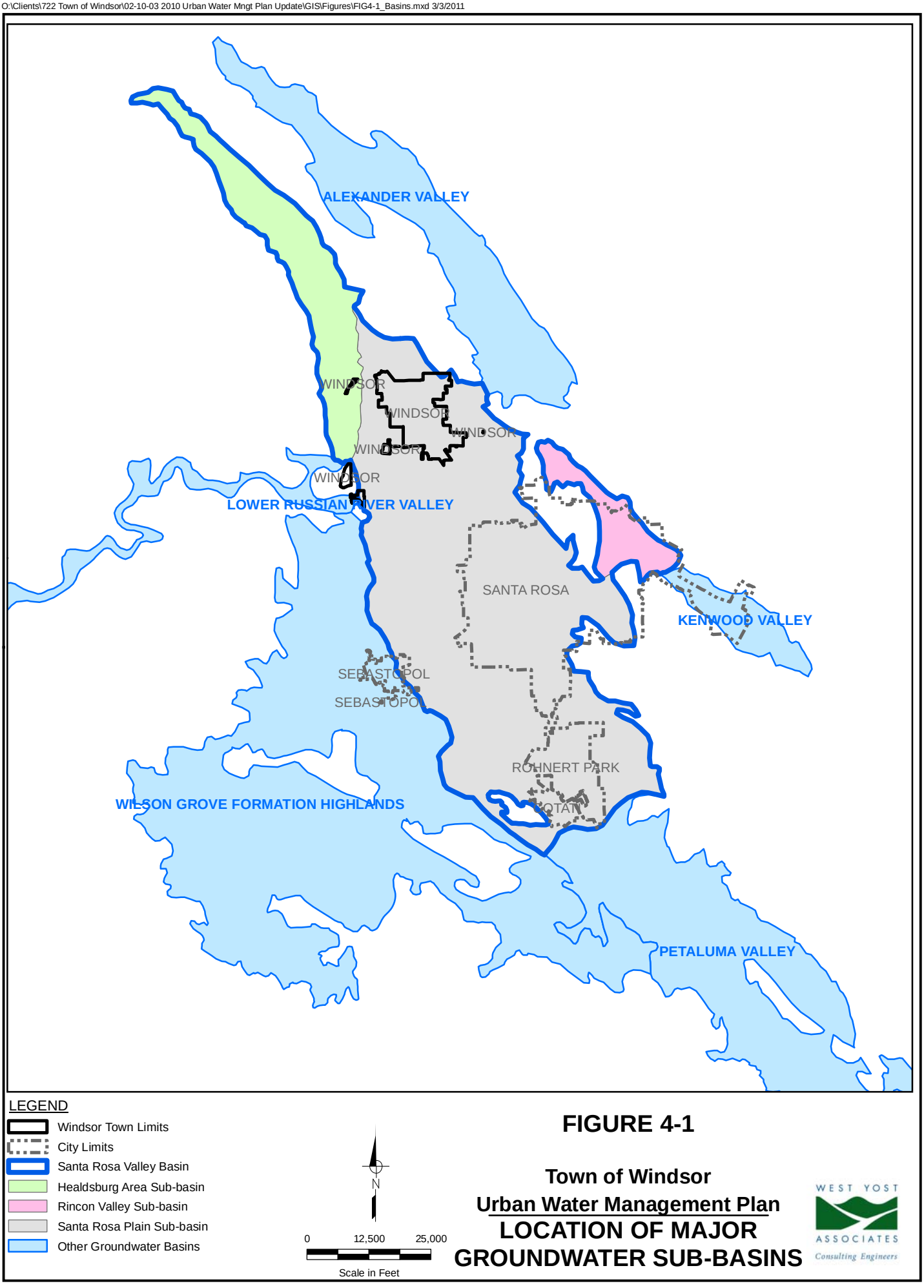

FIGURE 4-1

Town of Windsor
Urban Water Management Plan
LOCATION OF MAJOR GROUNDWATER SUB-BASINS

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Consulting Engineers

The Town owns and operates a wastewater treatment system which produces and supplies disinfected tertiary reclaimed water. The reclamation system includes a Water Reclamation Plant, recycled water storage ponds, discharge to Mark West Creek, agricultural irrigation and urban uses, and will soon (2011) include delivery to the Geysers Geothermal Project. The Town's water reclamation permits enable it to provide recycled water for irrigation of rural pasture, crops and vineyards and for non-potable use on in-Town parks, playgrounds, and commercial and residential landscaping.

This section provides information on the amount of generated wastewater, existing disposal of wastewater, the amount of recycled water potentially available, and existing and future potential uses for the Town's recycled water.

5.1 COORDINATION

The Town works with a number of entities responsible for water supply and wastewater collection and treatment. The Town has coordinated its recycled water plans with a number of agencies in the development of its Water Reclamation Master Plan and the Water Reclamation Joint Use Feasibility Study (Joint Use Study). Additionally, the Town is working with the development community to examine and expand recycled water use areas in the Town, with agricultural property owners to expand recycled water irrigation outside of the Town, and to develop additional water storage. In 2008, the Town certified an EIR and approved a project to construct a 215 MG recycled water storage reservoir at its Eastside Road property. During preparation of the EIR, the Town conducted a public outreach program in addition to coordination with regulatory agencies and neighboring utilities who may be interested in maintaining or acquiring available recycled water. The Town continues to implement an extensive public recycled water awareness campaign as part of its on-going water conservation program and also provides recycled water irrigation at the Town Green, Windsor High School, Vintage Greens Subdivision, Wilson Ranch Soccer Park, Windsor Golf Course, and parks in the Vintana Subdivision. Table 5-1 identifies the public agencies the Town coordinates with in the operation and future enhancement of its water reclamation system. The Town's Geysers Pump Station is a joint facility with the City of Santa Rosa. The Town also completed the Airport Area Recycled Water Feasibility Study in conjunction with the Agency in mid-2011.

Table 5-1. Participating Agencies

Agency Name	Agency Type	Wastewater System	Plan Development Role
Sonoma County Water Agency	Wholesale Water Supplier	Airport Larkfield/Wikiup Sanitation Zone (ALWSZ)	Provided recycled water supply and demand information, jointly prepared feasibility study.
City of Santa Rosa	Municipality	Santa Rosa Wastewater system and the Laguna Subregional Wastewater Facility (Laguna Facility)	Provided recycled water supply and demand information
North Coast Regional Water Quality Control Board	State Regulatory Agency	Regulates Systems in the North Coast Region	Regulates Town recycled water system through issuance of the National Pollutant Discharge Elimination System (NPDES) Permit
State Department of Health Services	State Regulatory Agency	Recycled Water systems in State	Implements regulations pertaining to urban uses of recycled water.

5.2 WASTEWATER QUANTITY AND REUSE AND DISPOSAL

This section provides information on the amount of wastewater collected and treated within the Town's service area and recycled wastewater.

5.2.1 Wastewater Collection and Treatment

The Town treats and discharges approximately 620 to 800 MG (approximately 1,900 to 2,450 AF) of disinfected tertiary recycled water to its recycled water system annually. For the past six years, approximately 250 to 335 MG (770 to 1,030 AF) of the Town's recycled water is used each year. The remainder is lost to evaporation or discharged to Mark West Creek as discussed below. A summary of the Town's historical effluent volumes is presented in Table 5-2.

Table 5-2. Historical Wastewater Collected and Treated

Year	2005	2006	2007	2008	2009	2010
Average Dry Weather Flow (ADWF), mgd[(a)]	1.57	1.54	1.36	1.29	1.29	1.37
Total Effluent Volume, MG[(b)]	788	804	618	668	697	792
Total Volume Reused, MG[(b)]	307	246	319	333	331	312
Average Annual Flow (AAF), mgd[(c)]	2.16	2.20	1.69	1.83	1.91	2.17
AAF/ADWF Peaking Factor[(d)]	1.37	1.43	1.24	1.41	1.48	1.84

Source: Town of Windsor Mass Balance.xls spreadsheet

(a) From 2005 UWMP and Town Spreadsheet "ADJUSTED INF FLOWS YYYY.xls"
(b) From 2005 UWMP and Town Spreadsheet "Mass Balance.xls"
(c) Total Effluent Volume divided by 365 (366 for 2008).
(d) AAF divided by ADWF.

The historical average peaking factor between average dry weather flow (ADWF) and average annual flow (AAF) is 1.4, the projected future peaking factor used in the Town's sewer system Water Balance Model is approximately 1.31. Total projected volume available for irrigation is dependent on future wastewater flows and future total recycled water storage capacity. As described in the 2005 UWMP, the 2001 Reclamation Master Plan presents an alternative which represents maximizing the available irrigation potential of an estimated 785 equivalent acres at an ADWF of 3.0 mgd. An equivalent acre is defined in the Water Reclamation Master Plan as an acre requiring 30 inches of irrigation water per year. Using this definition, 785 equivalent acres results in an estimated 1,963 AF of water reuse per year.

The projected ADWF from 2015 to 2035 was provided by the Town and is based on the projected water demand and the sewer system water balance model, developed by others.

A trend over the past six years of reduced ADWF and the increased rated capacity of the plant due to the Geysers Pump Station from 1.6 mgd ADWF has put off the need for additional storage for the foreseeable future. The projected annual volume of wastewater collected, treated, and available for recycled water use is shown in Table 5-3. All wastewater treated at the Town's facility is treated to disinfected tertiary standards.

Table 5-3. Projected Wastewater Collected and Treated (DWR Table 21)

Year	2005	2010	2015	2020	2025	2030	2035
Average Dry Weather Flow, mgd[a]	1.57	1.37	1.72	1.75	1.80	1.86	1.93
Average Annual Flow, mgd[b]	2.2	2.2	2.25	2.27	2.36	2.44	2.52
Total Projected Effluent Volume, MGY[c]	788	792	820	830	860	890	920
Total Projected Volume Available for Local Reuse, MGY[d]	307	312	367	373	384	396	411
Total Projected Recycled Water Delivery to Geysers Geothermal Project, MGY[e]	—	—	193	274	274	274	274
Total Projected Volume Available for Reuse, MGY	307	312	560	647	657	670	685
Total Projected Volume Available for Reuse, AFY	942	957	1,719	1,985	2,018	2,057	2,103
Remaining Volume for Discharge or Other Use, MGY[f]	502	430	260	183	203	220	235
Remaining Volume for Discharge or Other Use, AFY[f]	1,541	1,320	798	562	622	674	721

Source: Town of Windsor May 2011.

[a] Based on ADWF increasing at the same rate as water use projections.
[b] ADWF times peaking factor of 1.31 based on Water Balance Model Influent Flow See Table 5-2 and text.
[c] Based on Town's sewer system Water Balance Model, except for 2005 and 2010 which are based on historical data (Table 5-2). All treated water meets disinfected tertiary criteria.
[d] Based on values and ratios developed in the 2005 UWMP. See text for discussion.
[e] Based on Geysers agreement of 0.53 mgd to Geysers in 2015 and 0.75 mgd to Geysers in 2020-2035.
[f] Total Effluent Volume minus Total Projected Volume Available for Reuse.

5.2.2 Wastewater Disposal

The Town's existing effluent discharge point is located on Mark West Creek, immediately downstream of the Trenton-Healdsburg Bridge. The Town is currently permitted to discharge disinfected tertiary effluent in quantities up to 1-percent of the natural flow of Mark West Creek from October 1 through May 14. The 1-percent discharge is calculated from the flow measured at the Trenton-Healdsburg Road bridge, minus the quantity discharged by the City of Santa Rosa's Laguna Treatment Plant. The current annual volume of disposed wastewater is shown in Table 5-4. The projected future disposal to Mark West Creek is mainly dependent upon the weather (frequency, duration, and spacing of rainfall events), although it is expected to decrease with the operation of the Geysers Pump Station.

Table 5-4. Disposal of Wastewater (Non-Recycled) (DWR Table 22)

Method of Disposal	Units	2005	2010	2015	2020	2025	2030	2035
Discharge to Mark West Creek (tertiary)[(a)]	MG	502	430	260	183	203	220	235
	AFY	1,541	1,320	798	562	622	674	721

[(a)] Total Effluent minus Total Projected Volume Available for Reuse from Table 5-3

According to the Town wastewater treatment plant data, over the period from 1994 to 2010, Town annual discharges to Mark West Creek ranged from 146 MG (2009) to 502 MG (2005). Town Council Resolution Number 1006-01, adopted on March 7, 2001, directs staff to discharge to Mark West Creek only as a last priority and to manage the system, along with the Town's recycled water storage, to enhance the amount and reliability of recycled water irrigation by the Town.

5.3 RECYCLED WATER USE

This section describes existing and potential recycled water use in the Town. Figure 5-1 depicts the location of the wastewater treatment facilities and reclamation facilities for the Town's service area.

5.3.1 Existing Recycled Water Use

A comparison to projections for 2010 recycled water use from the 2005 UWMP and actual use in 2010 is shown in Table 5-5.

Approximately 1,550 AF of recycled water was used in the Town in 2010. This recycled water use by category is listed in Table 5-5. Some of the specific recycled water uses include:

- Irrigation of Windsor High School's athletic fields and landscaping,
- Flush water for Windsor High School's and Fire Station's toilets and urinals,
- Landscape irrigation of new homes located in the Vintage Greens 470-unit subdivision which have been built with a dual-pipe system,
- Windsor Golf Course,

- Town parks,
- Commercial Irrigation, and
- Irrigation of vineyards and pasture.

Table 5-5. Recycled Water – 2005 UWMP use projection compared to 2010 actual, AFY (DWR Table 24)

Type of Use	2010 Actual Use, AFY	2005 Projection for 2010[a]
Agriculture	410	928
Landscape Irrigation	318	372
Commercial Irrigation	509	[b]
Golf Course Irrigation	309	[b]
Wildlife Habitat	—	—
Wetlands	—	—
Industrial reuse	—	—
Groundwater Recharge	—	—
Seawater barrier	—	—
Geothermal/Energy	—	—
Indirect Potable Reuse	—	—
Total	1,546	1,300

[a] 2005 UWMP Table 5-8.
[b] Included in the "Landscape Irrigation" type of use category.

5.3.2 Potential and Projected Recycled Water Use

The Water Reclamation Master Plan adopted in 2001 described the potential recycled water use alternatives for the Town (Brelje & Race, 2001).

Major factors that determine the use of recycled water and implementation of recycled water projects are the financial feasibility of connecting users to the system through the construction of storage tanks, pipelines and other facilities. Proximity to the production of the recycled water and the transmission/distribution system is a major factor in considering use of recycled water. In addition, the recycled water users must make their own investment in constructing and operating the on-site irrigation pipelines and sprinkler systems with the necessary warning signs, backflow prevention, and associated health and safety requirements. The projected future use of recycled water for the Town's service area for the next 25 years is shown in Table 5-6. Each category in the DWR standard table is discussed below.

Table 5-6. Projected Future Use of Recycled Water in Service Area, AFY (DWR Table 23)

Type of Use	Description	Feasibility	2010[a]	2015[b]	2020	2025	2030	2035
Agricultural Irrigation[c]	Irrigation for vineyards	Expected to Continue	410	375	375	375	375	375
Landscape Irrigation[d]	Residential common areas and Parks	Expected to Continue	318	170	177	190	205	223
Commercial Irrigation[d]	Commercial turf and non-potable indoor use	Expected to Continue	509	271	284	304	328	356
Golf Course Irrigation	Existing use to continue	Expected to continue	309	309	309	309	309	309
Wildlife Habitat	No plans at this time	Not feasible	—	—	—	—	—	—
Wetlands	No plans at this time	Not feasible	—	—	—	—	—	—
Industrial reuse	No plans at this time	Not feasible	—	—	—	—	—	—
Groundwater Recharge	No plans at this time	Not feasible	—	—	—	—	—	—
Seawater barrier	No seawater intrusion	Not feasible	—	—	—	—	—	—
Geothermal/Energy[e]	Water delivery to Geysers Pipeline for steam field recharge	Expected to begin in mid-2011	—	594	840	840	840	840
Indirect Potable Reuse	No plans at this time	Not Feasible	—	—	—	—	—	—
Total			1,546	1,719	1,985	2,018	2,057	2,103

[a] Based on historical deliveries.
[b] Based on projected deliveries, quantity delivered for Agricultural Irrigation, Landscape Irrigation, and Commercial Irrigation are shown to be less in 2015 than in 2010 because actual deliveries in 2010 exceeded the amount projected in the 2001 Water Reclamation Master Plan.
[c] A portion of Agricultural use is expected to offset groundwater pumping.
[d] A portion of Urban landscape use is expected to offset potable water demand.
[e] The Geysers agreement between the Town and City of Santa Rosa specifies three annual flow rates for the Windsor Pump Station: 0.53 mgd, 0.75 mgd, and 1.25 mgd, corresponding to 594, 840, and 1,400 AFY, respectively.

5.3.2.1 Irrigation Lands

Irrigation lands to be considered for recycled water use include Agricultural Irrigation, Landscape Irrigation, Commercial Irrigation, Golf Course Irrigation, and Wildlife Habitat. In order to distribute recycled water from the storage ponds to the irrigated lands, the recycled water pipelines would need to be extended.

5.3.2.2 Agricultural Irrigation

The Town currently irrigates approximately 164 equivalent acres of vineyards and pasture. The Town is not expecting to expand this recycled water use in the foreseeable future.

5.3.2.3 Landscape Irrigation

Landscape Irrigation includes outside irrigation at the High School, and irrigation of multi-family residential common areas. The Town is expecting to expand this recycled water use.

5.3.2.4 Commercial Irrigation

Commercial Irrigation includes indoor water use at the High School and Fire Station, and irrigated commercial landscape. The Town is expecting to expand this recycled water use.

5.3.2.5 Golf Course Irrigation

The Town currently delivers recycled water to the Golf Course for irrigation and intends to continue to do so into the foreseeable future. No expansion of this use is projected.

5.3.2.6 Wildlife Habitat

The Town does not currently have any opportunities for irrigation of Wildlife Habitat and does not anticipate delivering recycled water for that use at this time.

5.3.2.7 Wetlands

At this time, the Town does not have plans to develop this recycled water use.

5.3.2.8 Industrial Reuse

The Town does not have plans to develop this recycled water use.

5.3.2.9 Groundwater Recharge

The groundwater basin is not reported to be in decline, therefore, the Town does not have plans to develop the recycled water infrastructure to support this potential reuse.

5.3.2.10 Seawater Barrier

As the Town is not located in an area experiencing saltwater intrusion, there are no plans to use recycled water as a seawater barrier.

5.3.2.11 Geothermal/Energy

The City of Santa Rosa's Geysers Recharge Project was identified as a project that would allow the disposal of up to 1.25 MGD (approximately 1,400 AFY) of the Town's recycled water year-round to the Geysers steamfields. Potential connection to the Geysers Recharge Project for the year-round disposal of 0.75 MGD of Windsor's tertiary recycled water, as envisioned in the Reclamation Master Plan, is scheduled to begin delivering recycled water into the Geysers pipeline in June 2011.

5.3.2.12 Indirect Potable Reuse

The Town does not have plans to develop this recycled water use.

5.4 METHODS TO ENCOURAGE RECYCLED WATER USE

Methods to encourage recycled water use and the projected amount of resulting recycled water use are presented in Table 5-7.

Table 5-7. Methods to Encourage Recycled Water Use, AFY (DWR Table 25)

Methods	AFY of Use Projected to Result from this Action					
	2010	2015	2020	2025	2030	2035
Ordinances, Financial Incentives, Reliable Supply, Geysers Contract	1,546	1,902	2,345	2,476	2,541	2,671

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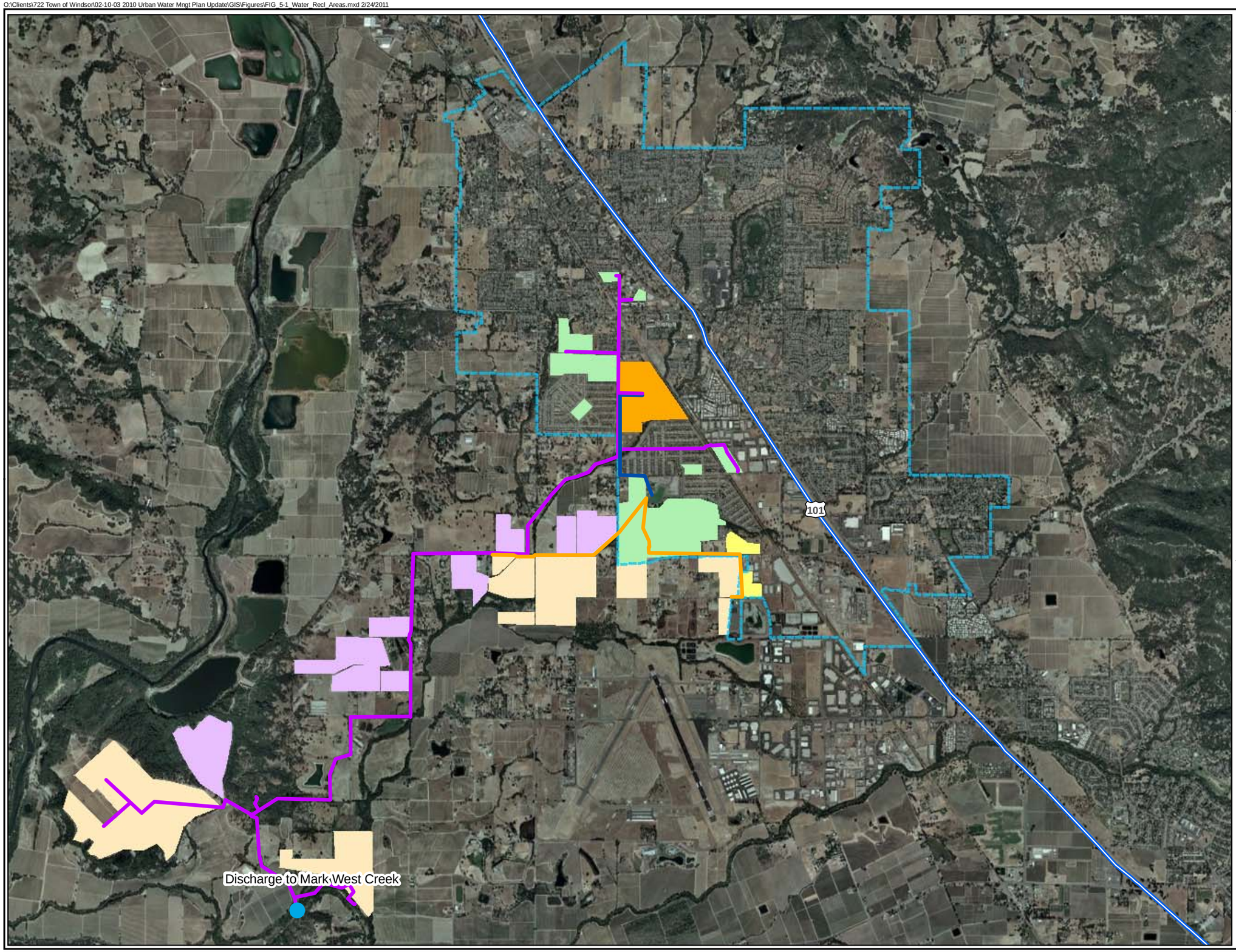
FIGURE 5-1

Town of Windsor
Urban Water Management Plan

WATER RECLAMATION USE AREAS



N

0 1,500 3,000

Scale in Feet

Notes
1. Location of mains approximate.

LEGEND

- Reclamation Plant
- Pasture, Fodder, Other Crops
- Parks, Golf Course
- Vineyard
- Commercial Landscaping
- Windsor SOI
- Effluent Pump Station & Mains
- Mitchell Lane Pump Station & Mains
- Transfer Main

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This section provides a description of the Town's water conservation program and its Best Management Practices (BMPs), which are also referred to as water demand management measures (DMMs). The Town utilizes water conservation BMPs as a method to reduce water demands, thereby reducing water supply need for the Town.

6.1 INTRODUCTION

The Town is 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 Regarding Urban Water Conservation (MOU). As signatory to the MOU, the Town has pledged their good faith effort towards implementing BMPs identified in the CUWCC MOU. The two primary purposes of the MOU are:

1. to expedite implementation of reasonable water conservation measures in urban areas, and
2. 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 Town signed the CUWCC MOU on August 9, 1999, and submits annual BMP reports to the CUWCC in accordance with the MOU. The MOU requires that a water utility implement only the BMPs that are economically feasible. If a BMP is not economically feasible, the utility may request an economic exemption for that BMP. The Town has not requested economic exemption from any of the BMPs at this time.

In prior years, the CUWCC BMPs matched the Urban Water Management Planning Act DMMs one-for-one. The CUWCC recently regrouped their BMPs into the following five categories:

1. Utility Operations Programs (DMMs C, D, J, L, M)
2. Educational Programs (DMMs G, H)
3. Residential (DMMs A, B, F, N)
4. Commercial, Industrial, Institutional (DMM I)
5. Landscape (DMM E)

The first two categories (Utility Operations Programs and Educational Programs) are grouped as Foundational BMPs and do not have a water conservation savings that can be directly attributed to them. The three remaining categories are grouped as Programmatic BMPs. The CUWCC provides guidance on how to estimate water conservation savings from the Programmatic BMPS. How the revised CUWCC BMP structure matches up with the UWMP DMMs is shown in Table 6-1. The Town's participation level for each of the BMPs is provided in greater detail in Table 6-2, located at the end of this chapter.

Urban water suppliers that are members of the CUWCC may submit their most recent BMP Annual Reports for reporting years 2009-2010 to meet the requirements of DWR Water Code Section 10631 (f). The Town is currently implementing all 14 DMMs. The level of implementation is described below. The Town's annual BMP Report for 2009-2010 is presented in Appendix G.

Table 6-1. Demand Management Measures and California Urban Water Conservation Council BMP Names

CUWCC BMP Organization and Names (2009 MOU)				UWMP DMMs	
Type	Category	BMP#	BMP Name	DMM#	DMM Name
Foundational	Utility Operations Programs	1.1.1	Conservation Coordinator	L	Water conservation coordinator
		1.1.2	Water Waste Prevention	M	Water waste prohibition
		1.1.3	Wholesale Agency Assistance Programs	J	Wholesale agency programs
		1.2	Water Loss Control	C	System water audits, leak detection, and repair
		1.3	Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections	D	Metering with commodity rates for all new connections and retrofit of existing connections
		1.4	Retail Conservation Pricing	K	Conservation pricing
	Education Programs	2.1	Public Information Programs	G	Public information programs
		2.2	School Education Programs	H	School education programs
Programmatic	Residential	3.1	Residential assistance program	A	Water survey programs for single-family residential and multifamily residential customers[(a)]
				B	Residential plumbing retrofit
		3.2	Landscape water survey	A	Water survey programs for single-family residential and multifamily residential customers[(a)]
		3.3	High-Efficiency Clothes Washing Machine Financial Incentive Programs	F	High-efficiency washing machine rebate programs
		3.4	WaterSense Specification (WSS) toilets	N	Residential ultra-low-flush toilet replacement programs
	Commercial, Industrial, and Institutional	4	Commercial, Industrial, and Institutional	I	Conservation programs for commercial, industrial, and institutional accounts
	Landscape	5	Landscape	E	Large landscape conservation programs and incentives

Source: 2010 UWMP Guidebook, Table E-1

[(a)] Components of DMM A (Water survey programs for single-family residential and multifamily residential customers) applies to both BMP 3.1 (Residential assistance program) and BMP 3.2 (Landscape water survey)

6.2 DEMAND MANAGEMENT MEASURES IMPLEMENTATION

This section describes the Town's implementation of each of the 14 urban water conservation BMPs (Tier 1) through the end of calendar year 2010. Section 6.3 describes additional water conservation measures, beyond the BMPs, the Town is considering implementing.

As provided by Town staff, the Town actively implements all of the relevant BMPs as follows:

6.2.1 Foundational BMPs

The Foundational BMPs include Utility Operations Practices and Education Programs.

BMP 1. Utility Operations Programs

BMP 1.1.1 Conservation Coordinator

The Town of Windsor has maintained a conservation coordinator on staff since 1998. Occasional, part-time staff in support of the conservation coordinator has existed at the Town from the year 1998 up to June 2006. Starting in June 2006, a full time water conservation specialist was hired. By July 2007 the water conservation specialist assumed duties as the full time conservation coordinator, leaving the specialist position vacant. The Town's adopted Biennial Budget for fiscal years 2011 – 2013 includes personnel time allocations related to implementation of the Town's water conservation activities as follows:

Position	Personnel Time[(a)]
Water Conservation Program Coordinator	1.000
Water Conservation Specialist (unfilled)	1.000
Accounting Supervisor	0.050
Accounting Specialist	0.050
Accounting Specialist	0.050
Accounting Technician	0.050
Accounting Technician	0.050
Maintenance Technician	0.050
Maintenance Worker	0.050
TOTAL STAFF	2.350

[(a)] Full time employee equivalents

BMP 1.1.2 Water Waste Prevention

In December 1999, the Town adopted Regulations and Restrictions on Water Use through Ordinance Number 99-123 (now Municipal Code 12-3-361), which promotes water conservation by prohibiting water waste and use of equipment which is wasteful. A copy of the ordinance is included in Appendix D. The ordinance gives the Town the authority to discontinue service if water waste is not corrected. The ordinance prohibits a number of wasteful practices including washing driveways with direct hosing, irrigation with excessive runoff, washing cars without a

hose nozzle, and use of non-recycling decorative water fountains. Any reported water waste incident receives immediate response from field staff. If water waste is identified, a door tag is left at the property to notify the customer of the violation and follow-up technical assistance is provided.

BMP 1.1.3 Wholesale Agency Assistance Programs

This BMP does not apply because the Town is not a wholesale water supplier.

BMP 1.2 Water Loss Control

Prior to 2009 the Town completed informal annual audits in the process of tabulating sales and production data. Most of the Town's transmission and distribution system is less than 15 years old and is in excellent condition. Consequently, the Town has experienced relatively few pipe failures or leaks. The Town has leak detection equipment and all leaks are traced and repaired as quickly as possible when noticed. In addition, the Town has an aggressive corrosion control program that is intended, in part, to prolong the useful life of the distribution system pipes.

In July 2009, the Town began implementing new water loss management procedures as detailed in the AWWA's 3rd Edition M36 Manual *Water Audits and Loss Control Programs*. In March 2011 staff received CUWCC training on the use of AWWA's Water Loss Audit Software. This software is now being utilized by the Town to complete a standard water audit and balance annually.

BMP 1.3 Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

All Town water connections are metered and have been, as required by Town Regulations, since 1959 when the original Windsor Water District was formed. Metering is recognized as a sound urban water management practice as well as a basic water conservation measure. Metering of each water connection provides the opportunity for the detection of water leaks and has the effect of compelling customers to manage their use of water, particularly for landscape irrigation. The Town's supply sources are also metered, and the data from the supply meters can be cross-checked against sales data to allow the Town to identify water lost in the transmission/distribution system.

A meter survey conducted in 2008 identified 74 mixed-use meters in the Town that serve both domestic and landscape water demand. In June 2010, the Town began implementation of a Service Split Rebate Program that provides an incentive for customers with mixed use meters to install dedicated landscape meters for irrigation. To date, one customer has participated in the Service Split Rebate Program to install a dedicated irrigation meter.

A written plan is being developed for meter testing, repair, and replacement.

BMP 1.4 Retail Conservation Pricing

The water and sewer rate structures for the Town of Windsor are both increasing block rates with multiple tiers. Meters are read monthly, with bi-monthly (6 per/yr.) billing cycles and billing units are 1,000 gallons.

BMP 2. Education Programs

BMP 2.1 Public Information Programs

Starting in 1998, the Town has had an active public information program to educate customers about the need for water conservation and ways they can conserve, and to influence customer behavior to conserve. Current program elements include website program information with links to other helpful sites, use of social networking sites such as Facebook, advertisements on public access television stations, use of outdoor banners, event tabling, bill stuffers, direct mailers, print ads, and more.

In July 2010, the Town initiated a professional services contract with a local non-profit to provide additional social marketing program development and implementation support. Program elements include neighborhood canvassing to increase awareness of available water conservation incentive programs, community workshops on water efficient landscape practices, increased event tabling and marketing of conservation programs at community events, increased earned and bought media advertising.

BMP 2.2 School Education Programs

The Town's Water Education Program is implemented by Sonoma County Water Agency (SCWA), the regional water wholesaler. SCWA provides a comprehensive program designed to help educators teach students the "value" of water as an important natural resource and to promote water conservation and stewardship of our watershed. The program includes classroom instructional presentations, field study opportunities, teacher trainings and workshops, free curriculum materials aligned with the existing California State Frameworks and the new 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 programs and materials are free to teachers in the service area. The following is a brief summary of the different program components:

Classroom Instructional Program and Field Study Program: Certain grade levels are offered a field study experience and some grades a classroom instructional program. Each grade level lesson has a subject specific focus that supports the California Science Standards and is designed to be developmentally appropriate.

Curriculum Materials: Curriculum Materials are available for all grade levels. Water Education Program packets with order forms are distributed in September to all schools in the service area for teachers to request education materials and direct instruction.

ZunZun: "The Musical Watershed" is a 45 minute school wide assembly where students are introduced to the topics of water pollution, recycling, watershed ecology, storm drain run-off, sanitary sewers and water conservation.

Water Awareness Contests: Two contests are conducted each year in celebration of Water Awareness Month, a poster contest for 3rd and 4th graders and a video contest for high school students.

6.2.2 Programmatic BMPs

The Programmatic BPMs include Residential; Commercial, Industrial, and Institutional; and, Landscape BMPs.

BMP 3. Residential

BMP 3.1 Residential Assistance Program

Since June 2006, the Town's Water Smart Home Program has offered site specific leak detection assistance to all residential customers, which includes a water conservation survey, water efficiency suggestions, and /or inspection. Free showerheads and faucet-aerators that meet the current water efficiency standard as stipulated in the WaterSense Specifications are provided as needed. The program is marketed primarily through phone contact with high water use customers or customers suspected of having leaks. Contact lists are automatically generated each billing cycle from accounts that are flagged as being above historic use. Additional marketing occurs through bill inserts, direct mail pieces, media buys, public access television, and the Town's website.

BMP 3.2 Landscape Water Survey

Since June 2006, the Town's Water Smart Home Program also provides site-specific landscape water surveys that include: checking the irrigation system and timers for maintenance and repairs as needed; estimating or measuring the landscape area; developing a customer irrigation schedule based on precipitation rate, local climate, irrigation system performance, and landscape conditions; and, providing the customer with evaluation results and water savings recommendations. The program is marketed primarily through phone contact with high water use customers or customers suspected of having leaks. Contact lists are automatically generated each billing cycle from accounts that are flagged as being above historic use. Additional marketing occurs through bill inserts, direct mail pieces, media buys, public access television, and the Town's website.

BMP 3.3 High-Efficiency Clothes Washers

From fiscal year 2005/06 through fiscal year end 2008/09, the Town offered a $75 rebate for the purchase of high-efficiency clothes washing machines that met an average water factor value of 6.0 or less. This included both Tier 2 and Tier 3 machines as promulgated by the Consortium for Energy Efficiency's *Residential Clothes Washer Specifications*. Beginning in fiscal year 2009/10 the Town increased the rebate amount to $125 and narrowed the eligibility list to include only high-efficiency clothes washing machines that met an average water factor value of 4.5 or Tier 3. The current water factor value for Tier 3 machines is 4.0 as of January 1, 2011. The program is marketed primarily through point of sale advertising at local retail appliance outlets. Additional marketing occurs through bill inserts, direct mail pieces, media buys, public access television, and the Town's website.

BMP 3.4 WaterSense Specification Toilets

The Town began offering rebate incentives for the installation of high efficiency toilets in May 2007. The Town provides two different rebate amounts for the purchase of WaterSense Specification toilets that use no more than 1.28 gallons per flush (gpf). Replacements of existing toilets that use 3.5 or more gpf are eligible for a $150 rebate. Replacements of existing toilets that use 1.6 or more gpf are eligible for a $50 rebate. Rebates at the $50 level will be discontinued in 2014. The program is marketed primarily through point of sale advertising at local retail plumbing fixture supply outlets. Additional marketing occurs through bill inserts, direct mail pieces, media buys, public access television, and the Town's website.

BMP 3.5 WaterSense Specification for Residential Development

As of January 1, 2011 the Town has adopted the California Green Building Standards Code, Tier 1 as the mandatory minimum requirement for all new residential construction.

BMP 4. Commercial, Industrial, and Institutional

BMP 4.1 Demonstrated Savings Measure List

High Efficiency Toilets

In May 2007 the Town began offering a rebate incentive of $150 for the purchase of high efficiency toilets that use no more than 1.28 gpf and that replace existing toilets that use 3.5 gpf or more. This incentive applies to the purchase of gravity tank type water closets, flushometer tank type water closets, flushometer valve type water closets, and electromechanical hydraulic type water closets. The program is marketed primarily through bill inserts, direct mail pieces, media buys, public access television, and the Town's website. Additional marketing occurs through a partnership with the Sonoma County Economic Development Board's Business Water Project.

Ultra Low Volume and Zero Consumption Urinals

In June 2010 the Town began offering a rebate incentive of $300 for the purchase of pint flush (0.325 gpf) or waterless urinals that replace existing urinals that use 1.0 gpf or more. The program is marketed primarily through bill inserts, direct mail pieces, media buys, public access television, and the Town's website. Additional marketing occurs through a partnership with the Sonoma County Economic Development Board's Business Water Project.

BMP 4.2 CII Flex Track Menu List

Water Audits

In partnership with the Sonoma County Economic Development Board's Business Water Project, the Town of Windsor offers all commercial, industrial, and institutional accounts free comprehensive water use assessments. These assessments are typically conducted by Town staff or, in the case of a business with more complex process water use, by a qualified independent contractor. Following completion of the assessment, businesses are provided a voluntary action plan for the reduction of water use and wastewater production at their facility. Free faucet-

aerators that meet the current water efficiency standard as stipulated in the WaterSense Specifications are provided as needed.

Sustained Water Use Reduction

Started in June 2007, the Town's Water Efficient Technology Program provides a rebate incentive of up to $25,000 for process or equipment changes that create sustained water savings. The incentive paid is based on the amount of water saved, with a minimum reduction of at least 50,000 gallons per year for a project to qualify. Projects may include, but are not limited to: commercial or industrial laundry upgrades; clean in place technology; cooling tower conductivity and/or pH controllers; industrial process water use reduction from recycling or deionization technologies. The program is marketed primarily through bill inserts, direct mail pieces, media buys, public access television, and the Town's website. Additional marketing occurs through a partnership with the Sonoma County Economic Development Board's Business Water Project.

Pre-Rinse Spray Valves

The Town participated in a regional direct install program for 1.6 gallon per minute pre-rinse spray valves for restaurants and other businesses with commercial food service/preparation components. This three phase regional program ended following completion of the third phase in fiscal year 2006/07.

BMP 5. Landscape

BMP 5.1 Accounts with Dedicated Irrigation Meters

The Town has developed ETo-based water use budgets equal to no more than 60% of annual reference evapotranspiration for 187 dedicated irrigation accounts. Accounts are provided notices during the irrigation season May – October showing the budgeted amount versus actual consumption. Customers over budget are offered technical assistance in the form of free landscape audits. These audits include checking the irrigation system and timers for maintenance and repairs as needed, estimating or measuring the landscape area, developing a customer irrigation schedule based on precipitation rate, local climate, irrigation system performance, and landscape conditions, reviewing the schedule with the customer, and providing the customer with evaluation results and water savings recommendations.

BMP 5.2 Commercial/Industrial/Institutional Accounts with Mixed-Use Meters

The Town continues to offer large landscape water use surveys to all 74 commercial accounts identified as having mixed use meters. The program is marketed primarily through bill inserts, direct mail pieces, media buys, public access television, and the Town's website. Additional marketing occurs through a partnership with the Sonoma County Economic Development Board's Business Water Project.

BMP 5.3 Customer Incentive Program for Irrigation Equipment Retrofits

Started in July 2008, the Town's Water Efficient Landscapes Program offers incentives for irrigation equipment retrofits, as well as incentives for replacing turf grass with a low water use landscape. Rebate amounts of up to $350 are available for residential customers, $650 for mixed-use accounts, and up to $2,500 for accounts with dedicated irrigation meters. Qualifying equipment retrofits include such items as rain shut-off devices, SMART controllers, high efficiency spray nozzles, check valves to prevent low head drainage, pressure regulation, drip irrigation conversions, and more. Turf grass removal is rebated based on $0.50 per square foot of turf removed. The program is marketed primarily through bill inserts, direct mail pieces, media buys, public access television, and the Town's website. Additional marketing occurs through a partnership with the Sonoma County Economic Development Board's Business Water Project and a professional services agreement with the non-profit Daily Acts.

6.3 ADDITIONAL DEMAND MANAGEMENT MEASURES

The Town has committed to implementing the CUWCC BMPs. The CUWCC BMPs, which are considered "Tier 1 BMPs", are currently in various stages of completion, as described above. Water conservation measures that are not part of the CUWCC BMPs are being considered for implementation by the Town and are described as "Tier 2 BMPs" and "New development standards." The proposed new development standards focus on low water using requirements for new single family housing. An analysis of the Tier 2 and new development standards was conducted by Maddaus Water Management (Maddaus) to roughly estimate the water savings potential. The Water Demand Analysis and Water Conservation Measures Update Report (Maddaus 2010) is included as Appendix E. The analysis projects the future water demands based on four levels of increasing conservation effort: (1) current unit water use and the projected water savings from future plumbing retrofits as required by the plumbing code, (2) Tier 1 BMP efforts to date and remaining Tier 1 BMP efforts, (3) future Tier 2 BMP efforts, and (4) adoption of new development standards. The new development standards water savings estimate does not reflect the water saving impacts of the Town's new residential development which are almost exclusively either mixed use, higher density, and/or utilize recycled water for outdoor uses. The water savings potential, therefore, is largely already being realized by newer development in the Town and is reflected in the base demand projections.

The Town will use its best effort to evaluate these additional water conservation measures and implement those measures that are found to be cost effective. Existing water conservation savings due to past implementation efforts are included in the baseline projection. Because the water conservation savings are projections, actual demand reduction and the manner in which the demand reduction is achieved may vary. Table 6-3 presents the Tier 2 BMPs.

Table 6-3. Tier 2 BMPs (Include the proposed new development standards)

Tier 2 BMP #	Measure Title
1	Rain-sensor (shut off device) retrofit on irrigation controllers
2	Cash for grass (turf removal program)
3	Financial incentives for being below water budget
4	Financial rebates for irrigation meters
5	Smart irrigation controller rebates
6	Financial incentives/rebates for irrigation upgrades
7	Hotel retrofit (with financial assistance) – CII existing
8	Offer new accounts reduced connection fees for installing efficient process equipment for selected businesses (restaurants, laundry mat, food/groceries and hospital) – REMOVED FROM ANALYSIS FOR 2010
9	Synthetic turf rebate – REMOVED FROM ANALYSIS FOR 2010
10	High efficiency toilet (HET)
11	Dishwasher new efficient – REMOVED FROM ANALYSIS FOR 2010
12	CII rebates – replace inefficient water using equipment
13	0.5 gal/flush urinals in new buildings
ND1	Rain-sensor shut off device on irrigation controllers
ND2	Smart irrigation controller
ND3	High efficiency toilet (HET)
ND4	Dishwasher new efficient
ND5	Clothes washing machines requirement for new residential
ND6	Hot water on demand
ND7	High efficiency faucets and showerheads
ND8	Landscape and irrigation requirements

ND = New Development

The three Tier 2 BMPs that were removed from analysis for 2010 (8, 9, and 11 in Table 6-3) were considered out of date, or superseded by other Tier 2 BMPs. As described in the Maddaus Report:

- Measure Tier 2–8 was removed because new development regulations have changed significantly since this measure was analyzed in 2005 and the regulations require higher efficiency fixtures than this measure.
- Measure Tier 2-9 was removed as rebates for installing synthetic turf are incorporated into Measure Tier 2-2, Cash for Grass.
- Measure Tier 2-11 was removed because this measure is not cost effective.

The BMP modeling analysis and demand projections were performed using the CUWCC approved DSS model which is a Microsoft® Office spreadsheet based program run from Windows XP. The DSS model has been designed to provide a detailed planning evaluation framework for water demand management programs. The DSS analysis projects on an annual basis the water savings and the estimated dollar values of the benefits and costs that would result from implementing the BMPs.

The total projected water savings estimated as a result of Tier 2 implementation is 312 AFY, including an estimated 199 AFY reduction due to new development standards, by the year 2035 or nearly 5 percent of the projected base demand of 6,315 AFY. The projected 2035 base demand of 6,315 AFY already reflects a decrease of approximately 704 AFY as a result of plumbing code changes and implementation of Tier 1 measures. Taken together, the total potential water conservation savings represents approximately 14 percent of total projected 2035 demands. Water conservation savings beyond the 14 BMPs are incorporated in Table 4-5 of this UWMP as a potential water supply.

6.4 DEMAND MANAGEMENT MEASURES NOT IMPLEMENTED

The Town is implementing all applicable Best Management Practices of the California Urban Water Conservation Council's Memorandum of Understanding regarding Urban Water Conservation.

6.5 WATER CONSERVATION ASSUMPTIONS AND MODELING

The water demand projections presented in Chapter 3 were developed based on certain assumptions regarding the future implementation of water conservation measures or BMPs. The Town has previously committed to implementing all of the CUWCC BMPs. The CUWCC BMPs are currently in various stages of completion. Water conservation measures that are not part of the CUWCC BMPs are also assumed to be implemented for this analysis. These measures are identified as Tier 2 BMPs. New development standards that focus on low water using requirements for new single family housing are also assumed. These assumed future water conservation activities were integrated with the current water use characteristics and the population growth projections using the DSS model. The analysis projects the future water demands based on four levels of increasing conservation effort: (1) current unit water use and the projected water savings from future plumbing retrofits as required by the plumbing code, (2) Tier 1 BMP efforts to date and remaining Tier 1 BMP efforts, (3) future Tier 2 BMP efforts, and (4) adoption of new development standards. The water demand projections presented in Chapter 3 assume that approximately half of the water savings from Tier 2 BMPs and 100 percent of savings from the new development standards would occur. The Town will use its best effort to implement these additional water conservation measures. Existing water conservation savings due to past implementation efforts are included in the baseline projection. Because the water conservation savings are projections, actual demand reduction and the manner in which the demand reduction is achieved may vary. Table 6-3 presents the Tier 2 BMPs. The analysis is presented in Appendix E.

The BMP modeling analysis and demand projections were performed using the CUWCC approved DSS model, a Microsoft® Office spreadsheet based program run from Windows XP. The DSS model has been used elsewhere in northern California, including a recent project for the San Francisco Public Utilities Commission. The DSS model has been designed to provide a detailed planning evaluation framework for water demand management programs. The DSS model performs a cost-effectiveness evaluation of each BMP using the data on market potential for each conservation measure and the assumptions for each conservation measure variable. The DSS analysis projects on an annual basis the water savings and the dollar values of the benefits and costs that would result from implementing the BMPs. The DSS model components consist of the following steps:

1. Establish customer base-year water use conditions by customer-billing category and then by end use.
2. Establish service area conditions for evaluation of conservation measures by creating a database of service area data relevant to the conservation measures to be evaluated.
3. Conduct model calibration to current water use conditions by end use fixture models.
4. Use the service area data to perform a benefit and cost evaluation of each BMP.
5. Develop water demand projections assuming the implementation of the selected BMPs.

Table 6-4 presents projected water conservation savings.

Table 6-4. Estimated Water Conservation Program Savings, AFY

Water Use	2015	2020	2025	2030	2035
Conservation Savings[(a)]	396	635	796	912	1,016

[(a)] Total projected savings including new plumbing codes, Tier 1, New Development standards, and 50 percent of Tier 2.

Table 6-2. Windsor Water Conservation Programs

BMP Category	Program	Program Start Date	Description	# Participants / Items Distributed Last 4 Fiscal Years							
				Residential				Commercial			
				FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 06-07	FY 07-08	FY 08-09	FY 09-10
Foundational: Utility Operations Practices	1.1.2 Water Waste Ordinance	December 1999	Prohibits wasteful water use practices								
Foundational: Education Programs	2.1 Public Information Program	December 1998	Includes website, social networking, public access television, banners, event tabling, direct mailers, print ads, and provision of free informational pamphlets on how to save water inside and outside a home or business								
Foundational: Education Programs	2.2 School Information Program	December 1998	Administered through wholesaler (SCWA), Indicates number of students reached	1643	2622	3978	2,840	NA	NA	NA	NA
Programmatic: Residential	3.1 Residential Assistance Program	December 1998[(a)]		59	111	144	95	NA	NA	NA	NA
Programmatic: Residential	3.1 Residential Assistance Program	December 1998[(a)]	Low Flow Aerators, 1.5 gpm	259	325	915	610	NA	NA	NA	NA
Programmatic: Residential	3.1 Residential Assistance Program	December 1998[(a)]	Self-Closing Hose Nozzles	?	91	108	127	NA	NA	NA	NA
Programmatic: Residential	3.1 Residential Assistance Program	November 2003[(a)]	Water Use Surveys (Indoor)	199	173	130	141	NA	NA	NA	NA
Programmatic: Residential	3.2 Landscape Water Survey	November 2003	Water Use Surveys (Landscape)	199	173	130	141	NA	NA	NA	NA
Programmatic: Residential	3.3 High Efficiency Clothes Washers	July 1999	$125 Rebate for CEE Tier 3 Machines	174	188	154	283	NA	NA	NA	NA
Programmatic: Residential	3.4 WaterSense Specification Toilets	May 2007	$50 Rebate for upgrading from 1.6 gpf, $150 Rebate for upgrading 3.5 gpf, $150 for Commercial	(2) 3.5 to 1.28 gpf	(23) 3.5 to 1.28 gpf	(28) 3.5 to 1.28, (12) 1.6 to 1.28 gpf	(181) 3.5 to 1.28 gpf, (99) 1.6 to 1.28 gpf	NA	NA	NA	NA
Programmatic: Commercial, Industrial, and Institutional	4.1.1 High Efficiency Toilets	May 2007	$150 Rebate for HETs	NA	NA	NA	NA	0	(5) 3.5 to 1.28 gpf	(8) 3.5 to 1.28	0
Programmatic: Commercial, Industrial, and Institutional	4.1.2 Urinal Replacement Programs: Replace 1.0 gpf or greater with 1/8 gpf or less = Tier 2	June 2010	$300 Rebate for HEUs	NA	NA	NA	NA	0	0	0	0
Programmatic: Commercial, Industrial, and Institutional	4.2.1 Water Audits	January 2003	Water Use Surveys (Indoor)	NA	NA	NA	NA	4	2	4	2
Programmatic: Commercial, Industrial, and Institutional	4.2.1 Water Audits	January 2003	Low Flow Showerheads, 2.0 gpm	NA	NA	NA	NA	0	0	0	5
Programmatic: Commercial, Industrial, and Institutional	4.2.1 Water Audits	January 2003	Low Flow Aerators, 0.5 gpm	NA	NA	NA	NA	0	22	75	53
Programmatic: Commercial, Industrial, and Institutional	4.2.2 Sustained Water Use Reduction	January 2008	water only accts; $4.50/1000 gal /yr saved, water & sewer accts; $11.40/1000 gal/yr saved up to 50% of the cost of equipment, minimum 50 Kgal/yr savings	NA	NA	NA	NA	0	0	0	1
Programmatic: Commercial, Industrial, and Institutional	4.2.3 Pre-Rinse Spray Valves	July 2004	Direct install program for 1.6 gpm pre-rinse spray valves in restaurants & other commercial food institutions	NA	NA	NA	NA	9 (phase 3)	discontinued	discontinued	discontinued
Programmatic: Landscape	5.1 Dedicated Irrigation Meter Water Budgets	June 2006	Provide comparison of actual use to water budget projected use	NA	NA	NA	NA	0	0	0	Budgets completed for 187 of 371 accounts
Programmatic: Landscape	5.2 CII Accounts with Mixed-Use Meters	June 2006	Lanscape Water Surveys	NA	NA	NA	NA	1	1	2	1
Programmatic: Landscape	5.3 Irrigation Equipment Rebate	July 2008	Water Efficient Landscape (WEL) program. Residential up to $350, mixed-use up to $650, commercial up to $2500	0	0	0	4	0	0	0	0
Programmatic: Landscape	5.3 Irrigation Equipment Rebate	July 2008	WEL Program: Rain Sensor / Shutoff	0	0	0	1	0	0	0	1
Programmatic: Landscape	5.3 Irrigation Equipment Rebate	July 2009	WEL Program: SMART Controller	0	0	0	0	0	0	0	1
Programmatic: Landscape	5.3 Irrigation Equipment Rebate	July 2008	WEL Program /Cash for Grass: Rebate is $0.50/$ft^2$, residential up to $350, mixed use up to $650, commercial up to $2,500. Part of WEL Program.	0	0	23 (14,436 ft^2)	69 (51,974 ft^2)	0	0	1 (5,406 ft^2)	2 (9,740 ft^2)
Programmatic: Landscape	Adoption of Regional Water Efficient Landscape Ordinance	January 2010	Yes- 10 % More restrictive than State WELO								

[(a)] Start date estimated by Town staff.

This section provides a comparison of the projected water supply and demand for the Town from 2015 through 2035. Water supply to demand comparisons are also provided for single dry year and multiple dry year scenarios. The water demand is developed in Chapter 3, water supply sources and quantities are defined in Chapter 4, and recycled water supply and demand are presented in Chapter 5 of this report. Decreasing water use resulting from future water conservation efforts are discussed in Chapter 6 and accounted for in the projected demands developed in Chapter 3.

7.1 WATER SUPPLY RELIABILITY

This section presents the projected supplies available during single and multiple-dry water years, based on supply reliability information provided to the Town by the Agency.

The basis years for which the historic water supply conditions are based are listed in Table 7-1.

Table 7-1. Basis of Water Year Data (DWR Table 27)

Water Year Type	Base Year(s)[(a)]
Normal Water Year	2006
Single Dry Water Year	2009
Multiple Dry Water Years	2007-2009

[(a)] According to the Department of Water Resources Hydrologic Classification Indices, 2006 was a wet year, 2007 was a dry year, 2008 was a critical dry year, and 2009 was a dry year. These are the most appropriate years for which data to complete Table 7-2 (DWR Table 28) were available for several reasons. First, because the Town was incorporated in 1992, the availability of water production data prior to that time is limited. Second, the State Water Resources Control Board mandated 25% reductions in diversions from the Russian River, creating a legislative drought, even though there was sufficient volume of water in storage to serve the estimated potable water demand.

The actual water supply from the Town's three water supply sources (Russian River Well Field, Agency Aqueduct, and groundwater) for the specific Normal, Single Dry and multiple dry years identified in Table 7-1are summarized in Table 7-2.

Table 7-2. Supply Reliability – Historic Conditions[a], AFY (DWR Table 28)

Sources	Normal Water Year (2006)	Single Dry Water Year (2009)	Multiple Dry Water Years			
			Year 1 (2007)	Year 2 (2008)	Year 3 (2009)[b]	Year 4 (N/A)
Russian River Well Field	3,820	3,207	3,889	3,957	3,207	—
Sonoma County Water Agency Aqueduct	628	517	528	509	517	—
Groundwater	—	—	—	—	—	—
Total	4,448	3,724	4,418	4,467	3,724	—
Percent of Normal	100	84	99	100	84	—

[a] As indicated in Table 7-1, footnote (a), these are the most appropriate years for which the Town has water supply data. The data included in this table are not the projected water supplies during Normal, Dry, and Multiple Dry years indicated in the remainder of this section, but actual historical deliveries for these specific years.

[b] The State Water Resources Control Board required a mandatory 25 percent reduction in Sonoma County Water Agency diversions from the Russian River in 2009, severely restricting the available water supply to the Town.

Factors resulting in inconsistency of supply are summarized in Table 7-3. Alternatives to mitigate the Agency's constrained delivery system could include new treatment and/or conveyance projects, or environmental mitigation projects. The Town could potentially develop groundwater wells, aquifer storage and recovery well capability, increased use of recycled water, and/or increased conservation.

Water quality issues are not anticipated to have a significant impact on water supply reliability. If applicable in the future, chemical contamination and the lowering of maximum contaminant levels (MCLs) for naturally occurring constituents can be mitigated by constructing new treatment facilities. These treatment facilities could have a significant cost.

Table 7-3. Description of the Factors in Inconsistency of Supply (DWR Table 29)

Name of Supply	Legal	Environmental	Water Quality	Climatic
Sonoma County Water Agency	Current supply is available at a consistent level of use with regard to these factors. Future supply increase may not be consistent due to delays in construction, in approval of water rights application, or in environmental documentation/mitigation.		None	Drought could result in a reduction of surface water supply.
Groundwater	None	None	None	None
Recycled Water	None	None	None	None

The Town's surface water supply from the Agency is subject to reductions during dry years (seasonal and climatic shortages) pursuant to SWRCB water rights Decision 1610 (adopted in April 1986). When the Lake Sonoma water volume is less than 100,000 AF during single dry years, a 30 percent reduction of diversions is required. The Town's groundwater supply capacity is assumed to not be impacted by single dry years.

7.2 WATER SHORTAGE CONTINGENCY PLAN

The Town's Water Shortage Contingency Plan, included in Appendix H, was adopted in June 2007 as part of the adoption of the 2005 UWMP Update. The Plan complies with Section 10632 of the California Water Code, which states that the Urban Water Management Plan shall provide an urban water shortage contingency analysis that includes information on the estimated three-year minimum water supply, actions in the event of a water shortage, water waste prohibitions, non-essential water uses during a water shortage, mechanisms for determining water use reductions, revenue and expenditure impacts and the emergency preparedness and plans for catastrophic events. Portions of the required Plan contents, such as the three-year minimum water supply, are included in this Chapter 7 of the UWMP.

The Town draft water shortage contingency model ordinance to be enacted during a water shortage is provided in Attachment 1 of Appendix H. Attachment 2 of Appendix H contains Section 12-3-361 from the Town's Municipal Code regarding Regulations and Restrictions on Water Use.

7.3 WATER QUALITY

The quality of the Town's water deliveries is regulated by the California Department of Public Health (DPH), which requires regular collection and testing of water samples to ensure that the quality meets regulatory standards and does not exceed MCLs. Both the Town and the Agency perform water quality testing, which has consistently yielded results within the acceptable regulatory limits.

The quality of existing surface water and groundwater supply sources over the next 25 years is expected to continue to be good. Surface water will continue to be treated to drinking water standards, and no surface water or groundwater quality deficiencies are foreseen to occur in the next 25 years. Table 7-4 summarizes the current and projected water supply changes due to water quality.

Table 7-4. Current and Projected Water Supply changes due to Water Quality – Percentage (DWR Table 30)

Water Source	2010	2015	2020	2025	2030	2035
Sonoma County Water Agency	0	0	0	0	0	0
Groundwater	0	0	0	0	0	0
Recycled Water	0	0	0	0	0	0
Total	0	0	0	0	0	0

7.4 DROUGHT PLANNING

Based on the criteria described above, the Town's minimum supply reliability for the next three years based on its current available supplies and information provided to the Town from the Agency regarding supplies available from the Russian River Well Field and Agency are shown in Table 7-5.

Table 7-5. Current Supply Reliability, AFY (DWR Table 31)

Source	Average/ Normal Water Year Supply (2011)	Multiple Dry Water Year Supply		
		Year 1 (2011)	Year 2 (2012)	Year 3 (2013)
Agency Aqueduct and Russian River Well Field Supply[(a)]	3,778	3,778	4,085	4,392
Local Groundwater[(d)]	—	—	—	—
Total	3,778	3,778	4,085	4,392

[(a)] Based on a straight line projection between actual 2010 delivery of 3,471 AF and projected 2015 delivery of 5,006 AF. According to the Agency, water deliveries in Multi-Dry Years will be 100 percent of Normal Year Deliveries.

A comparison of the projected normal year water supply available to the Town and customer demands from 2015 through 2035, in five-year increments, is shown in Table 7-6.

Table 7-6. Projected Normal Water Supply and Demand Comparison, AFY (DWR Table 32)

	2015	2020	2025	2030	2035
Agency Aqueduct and Russian River Well Field Supply[(a)]	5,006	5,118	5,200	5,200	5,200
Local Groundwater[(a)]	—	—	162	300	300
Potable Water Offset with Recycled Water Expansion[(a)]	13	55	55	55	55
Supply Totals	5,019	5,173	5,417	5,555	5,555
Demand Totals[(b)]	5,019	5,173	5,417	5,718	6,003
Difference/Other Water Supply Sources[(a)]	0	0	0	163	448
Difference as a percent of Supply	0	0	0	-3	-8
Difference as a percent of Demand	0	0	0	-3	-7

[(a)] See Table 4-5.
[(b)] See Table 3-10. Includes savings due to water conservation program.

As shown in Table 7-6, the Town has sufficient water supplies through 2025 to meet Normal Year water demands. However, a supply deficit of approximately 162 AFY is projected in 2030, increasing to about 450 AFY in 2035. Over the next several years the Town will be evaluating a variety of sources including: future urban recycled water use, additional off river water supply, aquifer storage and recovery wells, increased conservation, and additional Agency supplies to help meet the Town's projected water demands. It should also be noted that the Town's existing water entitlement under the existing Restructured Agreement with the Agency states the Town's

water supply is 5,625 AFY. Therefore, if the Town were to receive its full entitlement from the Agency in 2035 only a 25 AFY deficiency would exist.

A discussion of the increased conservation measures is included in Chapter 6.

A comparison of the projected single dry year water supply available to the Town and customer demands from 2010 through 2035, in five-year increments, is shown in Table 7-7.

Table 7-7. Supply and Demand Comparison – Single Dry Year, AFY (DWR Table 33)

	2015	2020	2025	2030	2035
Agency Aqueduct and Russian River Well Field Supply[(a)]	3,504	3,583	3,640	3,640	3,640
Local Groundwater[(a)]	600	600	600	600	600
Potable Water Offset with Recycled Water Expansion[(a)]	13	55	55	55	55
Supply Totals	4,117	4,238	4,295	4,295	4,295
Required Percent Demand Reduction From Normal Year[(b)]	18	18	21	25	29
Demand Totals[(b)]	4,117	4,238	4,295	4,295	4,295
Difference/ Other Water Supply Sources	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0

(a) See Table 4-4 and Table 4-5. As indicated by the Agency, Single Dry Year water deliveries are assumed to be 70 percent of Normal Year water deliveries. Local Groundwater deliveries during single dry years are assumed to be at 50 percent of the total installed capacity.

(b) Based on reduction from Normal Year Demand Totals shown in Table 7-6. Assumes a Water Shortage Emergency Stage 3 would be declared, which provides for reduction in water demands of 25 to 50 percent. See Water Shortage Contingency Plan Table 1. These data assume a 30 percent reduction in Agency supply would trigger a corresponding 18-29 percent reduction in demand, assuming increased groundwater pumping.

A comparison of the projected multiple dry year water supply available to the Town and customer demands from 2010 through 2035, in five-year increments, is shown in Table 7-8.

Table 7-8. Supply and Demand Comparison – Multiple Dry Year, AFY (DWR Table 34)

		3-Year Dry Period Beginning				
		2015	2020	2025	2030	2035
Multiple-dry year first year supply	Supply Totals[(a)]	5,019	5,173	5,417	5,555	5,555
	Demand Totals	5,019	5,173	5,417	5,718	6,003
	Difference	0	0	0	-163	-448
	Difference as % of Supply	0	0	0	-3	-8
	Difference as % of Demand	0	0	0	-3	-7
Multiple-dry year second year supply	Supply Totals[(a)]	5,019	5,173	5,417	5,555	5,555
	Demand Totals	5,019	5,173	5,417	5,718	6,003
	Difference	0	0	0	-163	-448
	Difference as % of Supply	0	0	0	-3	-8
	Difference as % of Demand	0	0	0	-3	-7
Multiple-dry year third year supply	Supply Totals[(a)]	5,019	5,173	5,417	5,555	5,555
	Demand Totals	5,019	5,173	5,417	5,718	6,003
	Difference	0	0	0	-163	-448
	Difference as % of Supply	0	0	0	-3	-8
	Difference as % of Demand	0	0	0	-3	-7

[(a)] As indicated in Tables 7-5 and 7-6, and in the text, the Multiple Dry Year water supplies are projected to be the same as the Normal Year water supplies, based on information provided to the Town by the Agency.