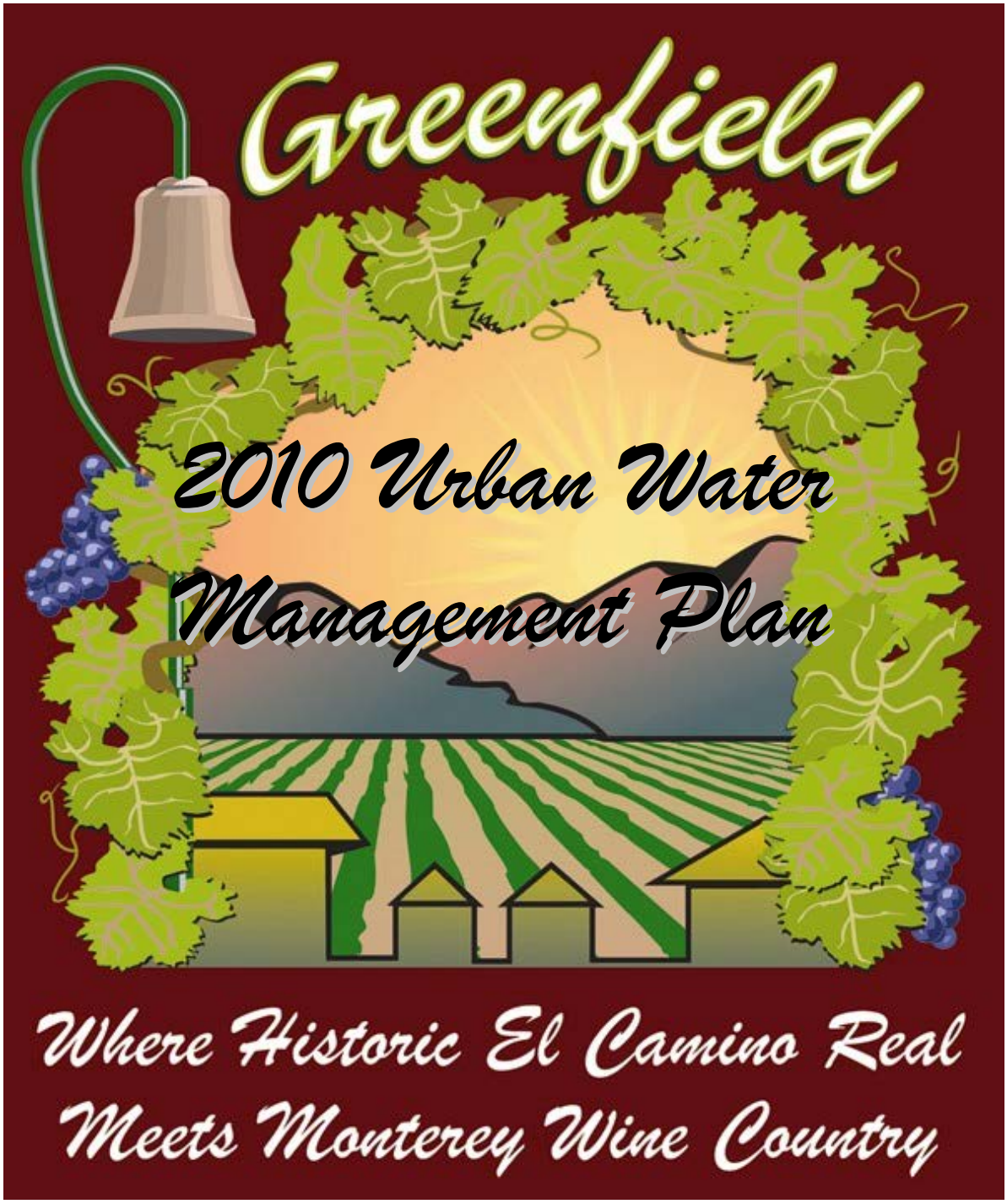

Prepared for the City of Greenfield by:

Price Consulting Firm
CLIFTON W. PRICE
Civil Engineering Management
Mariposa (209) 742-6859
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City of Greenfield
2010 Urban Water Management Plan
Contact Sheet

Date plan submitted to the Department of Water Resources:

Name of person preparing this plan:

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List of City Contacts:

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Dale Lipp, Public Works Director
Phone: **(831) 674-2301**
E-mail address: **DLipp@ci.greenfield.ca.us**

The Water supplier is a: **Municipality**

Utility services provided by the water supplier include: **Water**

Is This Agency a Bureau of Reclamation Contractor? **No**

Is This Agency a State Water Project Contractor? **No**

1.0 Urban Water Management Plan Preparation

1.1 Introduction

This Plan provides information and analyses specific to the City of Greenfield (City), and describes the regional context in which it operates. The City's current and projected water demands are considered over the next 20 years to ensure there will be sufficient water supply to meet these demands. Water shortage contingencies are discussed, as well as reliability of the water supply against various situations. The ability to meet conservation goals by 2020 is detailed. The Plan also reviews proposed projects and programs that will aim to protect the water supply and increase conservation efforts of the City.

Analysis of the City's current needs against future forecasting scenarios will allow the City to gauge sufficiency of the water supply available to them and plan for alternatives should a shortage occur.

The City plans on development and implementation of integrated master planning for water, wastewater and storm water. This plan would include deployment of water management tools. The effort would include a feasibility study for utilizing the neighboring City's water reclamation facility versus upgrading the City's existing wastewater treatment facility. In either case, options would become available for use of recycled water to offset potable demand currently used for irrigation limiting the amount of water pulled from the underlying aquifer. This holistic approach to water resource planning will allow the City to better prioritize its water resource related capital improvement projects with a focus on how to maximize water conservation efforts and ensure future sustainability of the City's potable water supply. The City has already implemented new water rates that will show progress toward meeting the conservation goals by 2020. Utilizing population projections, water use rate structures, and water budgets for large landscaped areas, the City will have a good grasp on where their supply and demand numbers need to be. Having management tools will ensure these numbers are measured and checked, and that conservation measures for various scenarios are ready for employment.

This Plan meets all requirements of the Water Code as described in the Department of Water Resources (DWR) "Guidebook to Assist Urban Water Suppliers to prepare a 2010 Urban Water Management Plan".

This section describes the requirements, purpose and contents of the Urban Water Management Planning Act (Act). This section also outlines the development and review process for this document, both internally and interactively with affiliated regional agencies and the public.

1.2 The Urban Water Management Planning Act

This Urban Water Management Plan (UWMP) has been prepared in response to the Urban Water Management Planning Act (Act), Water Code Division 6, Part 2.6, Sections 10610 through 10656. This Act, which became effective in 1984 and has since had several amendments, requires that, "Every urban water supplier shall prepare and adopt an Urban Water Management Plan." An urban water supplier is defined by the Act as a, "Supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually."

The City of Greenfield's (City) water system currently provides water to more than 3,000 customers. This 2010 Urban Water Management Plan replaces the City's 2008 Plan due to the scope of regulatory changes needed to meet the 2010 plan requirements. Updated Plans will continue to be submitted each year ending in a 5 or 0, or every five years. It should be noted that no regional or basin-wide plan has been developed to date. The Salinas Valley Integrated Regional Water Management Functionally Equivalent Plan (IRWMP) was adopted by Monterey County Water Resources Agency in 2006. That plan assumes that mid-county will continue to supply water needs with groundwater, so this Plan is consistent with the IRWMP.

1.3 Plan Coordination

1.3.1 Public Participation

Law

> 10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

The City of Greenfield has actively encouraged community participation in its urban water management planning efforts. Notice of a public hearing was posted on the public bulletin board at City Hall on INSERT DATE HERE, and in local newspapers including the NEWSPAPER NAME (INSERT DATES HERE). The draft Plan was posted to the City's website and made available at Public Works for advance review and consideration on February 25, 2013. A public hearing was held on March 26, 2013 to solicit comments and feedback from the community. No public comments on the Draft Report were received at the public hearing. City Council members asked questions regarding the UWMP. These questions were answered by the Public Works Director, and no changes to the document except the addition of this description were made as a result of the public hearing.

Revisions were made to the Plan as necessary and appropriate as a result of the public hearing, at which time the final Plan was reposted to the City's website.

A second public hearing was held April 23, 2013, prior to adoption of the Plan. After adoption, the Final adopted Plan was reposted to the City's website.

1.3.2 Agency Coordination

Law

> 10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

Coordination within the City

The City's Public Works Department has worked closely with the City's Finance and Planning Departments and City Manager in the preparation of this Urban Water Management Plan. Additional coordination with outside City representatives (consultants) who have prepared and/or are preparing affiliated plans and studies has also been instrumental in preparing the Plan. The City Council has heard and reviewed the necessary Plan components to ensure the Plan is consistent with the City's ultimate local and regional goals as represented by the current General Plan, applicable General Plan Amendments and the most recent Water, Wastewater and Storm Water planning documents.

Interagency Coordination

Affiliated agencies that were contacted and utilized as resources for the preparation of this Plan included the Monterey County Water Resources Agency (MCWRA), the Central Coast Regional Water Quality Control Board (RWQCB), the California Department of Public Health District 05 (CDPH), United States Geological Surveys (USGS), the Monterey County Resource Agency (RMA) and the nearby city of Soledad.

Each of these agencies was provided with a notice that this UWMP was being reviewed and updated on February 21, 2013. The notice included a schedule of public review and anticipated adoption dates. A copy of these letters is provided in Appendix A. Additional agencies or public entities that contributed to the UWMP update include AMBAG, the California Department of Water Resources (DWR) and the California Department of Finance (DOF).

Table 1 Coordination With Appropriate Agencies

Table 1
Coordination with appropriate agencies

Coordinating Agencies	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
Water mgmt agencies							
-Monterey County Water Resources Agency						X	
-Regional Water Quality Control Board						X	
-Ca. Dept. of Public Health						X	
Relevant public agencies						X	
- City of Soledad						X	
- County of Monterey RMA						X	
- DOF				X			
-AMBAG				X			
-DWR				X	X		
-USGS						X	
General public						X	

1.4 Plan Adoption

This Plan has been prepared by the City with the assistance of Price Consulting Firm. A list of City contacts is included at the front of this document.

The Urban Water Management Plan was adopted by City Council on April 23, 2013 and submitted to the California Department of Water Resources on April 30, 2013. The adopted Resolution may be found in Appendix B of this Plan.

2.0 Water System Description

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

2.1 Geography

The City of Greenfield is (formerly, Clarke Colony) is a city in Monterey County, California, United States. Greenfield is located 33 miles (53 km) southeast of Salinas, at an elevation of 289 feet (88 m) in the highly agricultural Salinas Valley. The city of Greenfield is located between the Gabilan mountain range to the east and the Santa Lucia mountain range to the west. According to the United States Census Bureau, the city has a total area of 2.1 square miles (5.4 km2), all of it land.

It has no common boundaries with other municipalities, and is surrounded completely by unincorporated areas of Monterey County. The City's nearest neighbor is Soledad, approximately eight miles to the north. The main conduit of surface water within the region is the Salinas River, flowing to the northwest and discharging into Monterey Bay. The unconfined flow of water within the underlying groundwater basin exhibits the same general flow characteristics as the Salinas River, with flow primarily in the northwesterly direction.

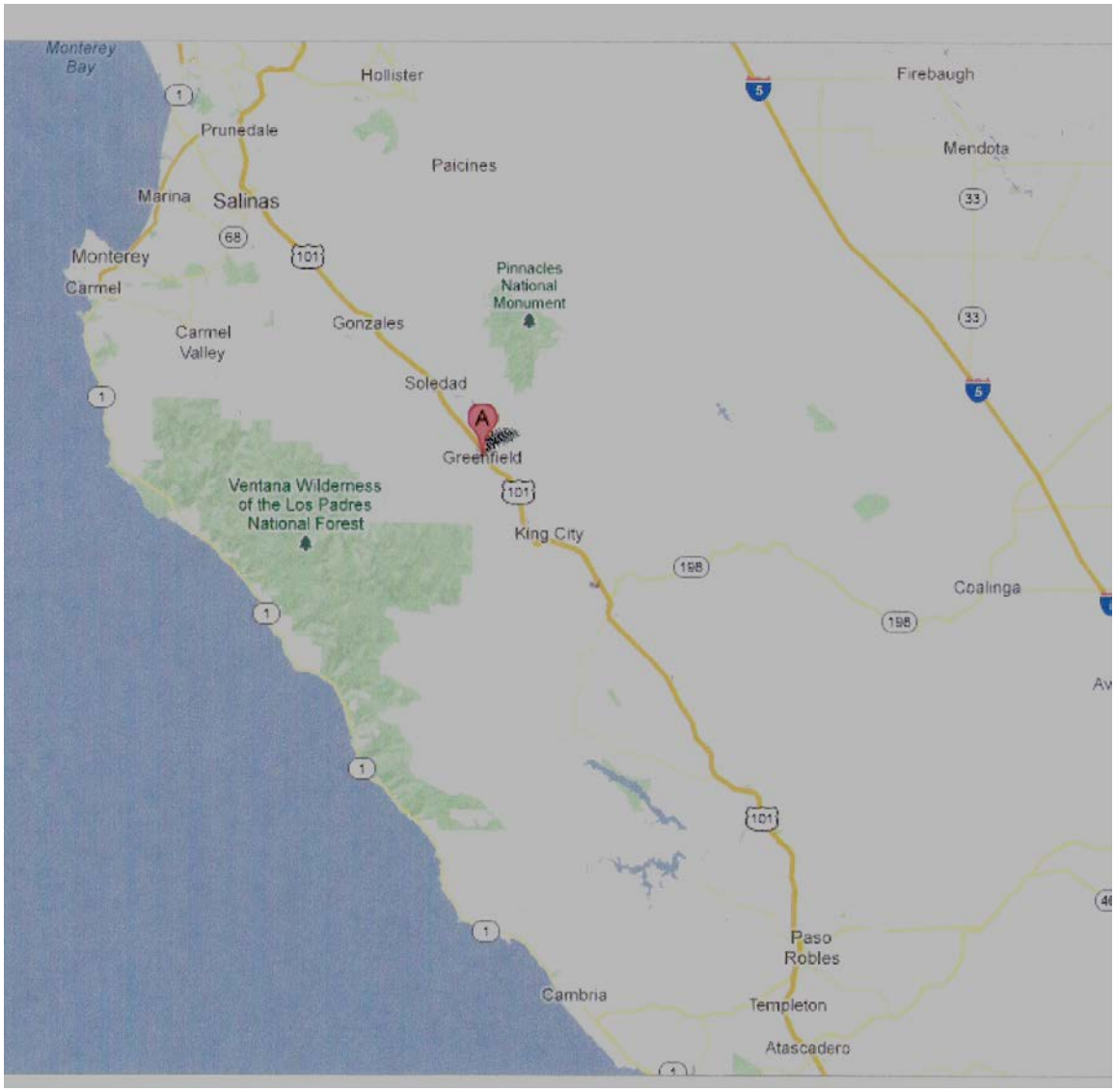


Figure 1: Vicinity Map of City

2.2 Climate

Greenfield has a Mediterranean climate, exhibiting dry, warm summers and cool, wet winters. Nearly all of its 12.3 inches of annual rainfall occur between October and April, with virtually no rainfall in the summer months. Average monthly values for rainfall, evapo-transpiration (ETo), and temperature are shown in the tables below.

Table 2 Climate

Table 2 Climate						
	Jan.	**Feb.**	**March**	**April**	**May**	**June**
Average ETo (in)	1.83	2.20	3.42	4.84	5.61	6.26
Average Rainfall (in)	2.35	2.65	2.49	0.74	0.24	0.07
Average Temperature (°F)	63	66	69	75	78	83

	July	**August**	**Sept.**	**Oct.**	**Nov.**	**Dec.**	**Annual**
Average ETo (in)	6.47	6.22	4.84	3.66	2.36	1.83	**49.54**
Average Rainfall (in)	0.01	0.05	0.25	0.55	1.23	1.67	**12.3**
Average Temperature (°F)	85	85	85	80	69	63	

Source: CIMIS Eto Data for Greenfield, weather.com for City of Greenfield Rainfall and Temperature Data

2.3 Regional Water System

The water supply for the Central Salinas Valley is derived almost exclusively from groundwater, and the City's potable water supply is entirely groundwater. The City of Greenfield's water source has historically been from groundwater resources, specifically the Salinas Valley Groundwater Basin. The City does not use surface water as a supply source. The City pumps groundwater from its three existing wells. One of the wells has been converted into a irrigation well for Patriot Park, while the other two wells are used for domestic production. The City overlays the Salinas Valley Groundwater Basin, specifically, the forebay sub-area.

Infiltration in the Salinas River channel is the principal source of groundwater recharge for the Salinas Valley groundwater basin. The recharge area is generally believed to end at a point between Chualar and the City of Salinas. Both natural runoff and conservation releases from Nacimiento and San Antonio Reservoirs contribute to the flow in the Salinas River. Infiltration from other smaller tributaries that drain the highland areas also provides recharge to the groundwater basin. The down-valley movement of this subsurface water is essential to the containment of saltwater intrusion into the Pressure sub-area. Higher elevations tend to have little potential for groundwater recharge due to either shallow or non-existent soils and steep slopes. These same characteristics pose problems for septic suitability and limit water availability.

Groundwater consumption in the Salinas Valley has increased over time as the amount of croplands under irrigation has continued to increase annually. Continued residential,

commercial and industrial development has also increased groundwater consumption. Agriculture continues to dominate, representing at least 90% of the area's water consumption. In some parts of the basin (although not the sub-area that the City is located in), agricultural and urban consumers are now using more water than is recharged annually, resulting in a groundwater overdraft.

2.4 Demographic Factors

Since 2008 population growth has slowed considerably, dropping annually between 2009 and 2012 to an average of less than 1%. Residential population is expected to increase to less than the County average of 1.3% in the next 5 years, and is projected to potentially reach 36,000 at build out in the second half of this century.

The 2010 United States Census reported that Greenfield had a population of 16,330. The population density was 7,647.9 people per square mile (2,952.9/km²). The average household size was 4.71. There were 3,100 families (89.6% of all households); the average family size was 4.72.

There were 3,752 housing units at an average density of 1,757.2 per square mile (678.5/km²), of which 1,829 (52.9%) were owner-occupied, and 1,631 (47.1%) were occupied by renters. The homeowner vacancy rate was 3.4%; the rental vacancy rate was 5.9%. 7,874 people (48.2% of the population) lived in owner-occupied housing units and 8,427 people (51.6%) lived in rental housing units.

Greenfield is the second most populous city in the Salinas Valley and is the fifth most populous city in Monterey County. In 2006, Greenfield was the fourth fastest growing city in California growing 15.6%, from 13,270 in 2005, to 15,335 in 2006. As of the 2007 California Department of Finance estimate, there were 16,629 people, 2,643 households, and 2,360 families residing in the city. The population density was 9,781.76 people per square mile (3,779.32/km²). There were 2,726 housing units at an average density of 1,606.5 per square mile (619.1/km²).

2.5 Population Projection

Residential, commercial, and industrial growth in the City has been affected by the recent economic downturn. Population growth during this period has been below that rate identified in the City's General Plan and the Department of Finance population growth projections which had the City growing to over 18,000 by 2014. The growth projections are now at 18,000 in 2030. As such, much of the development originally predicted to occur between 2005 and 2010 has not yet occurred.

Current and projected population is shown in the table below. 2010 data is from the US Census. Projections are from the Department of Finance annual growth rates for Monterey County.

Table 3 Population Projections

Table 3 Population — current and projected						
	2010	**2015**	**2020**	**2025**	**2030**	**Data source**
Service area population	16330	16722	17123	17568	18025	DOF

3.0 Water System Demands

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:
>
> (A) Single-family residential; (B) Multi-family; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.
>
> (2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.
>
> 20x2020

This section describes the City's water system demands, including its calculated baseline (base daily per capita) water use and interim and urban water use targets.

3.1 Current Water Demands

The City of Greenfield serves over 3,500 water meters. The overwhelming majority of the City's water connections are for single family residential (SFR) accounts. SFR accounts make up 83% of the service connections; multi-family customers (apartments,

duplexes and trailer parks) make up approximately 11%; commercial (businesses, schools, churches and business parks) make up 4%; landscape (parks and medians) make up 1%; and 1% are "other" (fire protection, government, and hydrants).

Water deliveries by use sector for 2005 and 2010 are shown in 4 and Table 5, respectively.

Table 4 Water Deliveries in 2005

Table 4
Water deliveries — actual, 2005

	2005				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	2267				unavailable
Multi-family	291				unavailable
Commercial/ Institutional	123		15		unavailable
Industrial	0				unavailable
Landscape	35				113.02
Agriculture	0				unavailable
Other	32				unavailable
Total	2748				1751.69

Units : acre-feet per year Source Greenfield Water System Statistics

Table 5 Water Deliveries in 2010

Table 5 Water deliveries — actual, 2010					
	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	3059	1349.58	0	0	1349.58
Multi-family	252	247.42	0	0	247.42
Commercial/ Institutional	101	193.66	0	0	193.66
Industrial	12	14.47	0	0	14.47
Landscape	50	59.12	0	0	59.12
Other	7	32.36	0	0	32.26
Total	3531	1896.61	0	0	1896.61
Units : acre-feet per year Source: Greenfield Water System Statistics					

3.2 Future Water Demand Projections

The 20-year projection in this plan is 2093 ac-ft/yr, as discussed in the following sections. The reduction is due to the rapid decrease in the pace of development. As shown in the population projections in Table 3, the population projected for 2030 is 18,025; compared to the projection of 36,000 (complete City build out).

3.2.1 Demand Projection Methodology

In the most recent DOF population projections (Table 3), the City will experience an annual increase in population of about 2.5% every five years. At this rate, the City will reach its maximum build out population of 36,000 well beyond 2030. It was therefore assumed that the City will not reach its build out development potential in 2030. A linear interpolation of these values between 2010 and 2030 is assumed. The reasonableness of this linear interpolation was verified with current population and water statistics data in 2005 through 2010 wherever possible.

3.2.2 Projected Water Demand by Sector

Residential Sector
The City water delivery statistics report residential water delivery in two categories: Single Family and multi-family. The average demand per unit was calculated (using 2010 data) for each of these use categories for future projections.

Industrial Sector

The square footage of industrial area was projected based on a linear interpolation between existing 2010 values and 18,000 population achieved by 2030 rather than the build out of 36,000. The 2010 water use statistics were applied to future projections based on the Department of Finance growth projections for Monterey County.

Landscape / Recreational Sector

The existing usage per area of landscape is calculated using the City's water use statistics from 2006-2010, and applied to future projections.

Commercial and Institutional / Government Sectors

In the City water delivery records, commercial and institutional uses are combined. Water use was assumed to be linear for Commercial and institutional/government, and a use per acre calculated based on the 2010 water delivery statistics. The future demand projections applied these use per area values to future development.

Unmetered Accounts

The City's records indicated there are no unmetered accounts as of 2010, thus the future projections from 2015 on do not include unmetered accounts.

Table 6 Projected Water Deliveries in 2015 and 2020

Table 6 Water deliveries — projected, 2015 and 2020				
	2015		2020	
	Metered		Metered	
Water use sectors	# of accounts	Volume	# of accounts	Volume
Single family	3132	1381.97	3208	1415.14
Multi-family	258	253.36	264	259.44
Commercial/ Institutional	103	198.31	106	203.07
Industrial	12	14.82	13	15.17
Landscape	51	60.54	52	61.99
Other	7	33.03	7	33.83
Total	3565	1942.03	3650	1988.63
Units : acre-feet per year				

Table 7 Projected Water Deliveries in 2025 and 2030

Table 7 Water deliveries — projected, 2025 and 2030				
	2025		2030	
	Metered		Metered	
Water use sectors	# of accounts	Volume	# of accounts	Volume
Single family	3291	1451.93	3377	1489.68
Multi-family	271	266.18	278	273.1
Commercial/ Institutional	109	208.35	111	213.76
Industrial	13	15.57	13	15.97
Landscape	54	63.60	55	65.26
Other	8	34.71	8	35.61
Total	3745	2040.34	3842	2093.39
Units : acre-feet per year				

Table 8 Summary of Actual and Projected Water Deliveries

Table 8 Total water use						
Water Use	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Total water deliveries	1751.69	1896.61	1942.03	1988.63	2040.34	2093.39
Sales to other water agencies						
Additional water uses and losses	225.99	41.19	42.18	43.19	44.32	45.47
Total	1977.68	1937.8	1984.21	2031.82	2084.66	2138.86
Units: acre-feet per year						

3.3 Baselines and Targets

The calculation and selection of water conservation targets for the 2010 Urban Water Management Plan is required by the Water Conservation Act of 2009[1]. Commonly called the 20x2020 ('Twenty by Twenty-Twenty') plan, this legislation established a statewide goal of reducing urban water per capita water demands by 20 percent by the year 2020.

An urban retail water supplier must set a 2020 water use target and a 2015 interim target using one of four methods. Three of these are defined in Section 10608.20(a)(1) of the Water Code, and the fourth was developed by the California Department of Water Resources (DWR). The 2020 water use target must be calculated using one of the following four methods:

- Method 1: Eighty percent of the water supplier's *baseline per capita water use*.
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and commercial, industrial, and institutional uses.
- Method 3: Ninety-five percent of the applicable state hydrologic region target as stated in the State's April 30, 2009, draft 20x2020 Water Conservation Plan.
- Method 4: The provisional target method developed by DWR uses conservation Best Management Practices (BMP) to determine the potential water demand reductions in each water use sector. A Calculator spreadsheet was developed for this method, which requires detailed information on current water uses.

A maximum conservation target, regardless of method used, is also defined as discussed below.

Gross water use is calculated as the total water entering the system minus wholesale water deliveries leaving the system. The City does not purchase or provide wholesale water, so the gross water use is simply the total well pumping for the period. Water suppliers may deduct from this total (1) recycled water use, (2) industrial process water use, and (3) agricultural irrigation use. The City does not currently directly re-use recycled water, nor provide agricultural irrigation water. Industrial process water is not separately metered from general industrial water uses, and so none of these deductions were made for the City's gross water use calculations.

Baseline per capita water use is calculated as the gross water use for a year divided by the average population during that year. Years may be defined by the water supplier as calendar year, fiscal year, or another 12-month reporting period. The water supplier will submit future compliance reports using the same reporting year. The City currently uses the calendar year for all water use reporting, and that method is utilized herein. Annual population for the City's service area is based on California Department of Finance estimates. A ten-year average water consumption rate must be calculated for a period ending not earlier than December 31, 2004 and not later than December 31, 2010. Ten years of water consumption data were not available, thus an average was developed according to the guidelines for the appropriate five year period. If the baseline demand is less than 100 gallons per capita per day (gpcd), no additional conservation reduction is required.

Conservation targets are established by choosing a representative baseline from the seven possible periods (ending in 2004-2010), and using one of the four methods. Table 9 shows the chosen time spans and the corresponding population, water use and resulting average demand rates for these periods. The City has adopted the average value of the 5-year period of 120 gpcd as the City baseline, from the period ending December 31, 2010.

Table 9 5-Year Range Base Daily Per Capita Water Use

Table 9 Base daily per capita water use — 5-year range				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2006	14309	1937048	135
Year 2	2007	15311	2040473	133
Year 3	2008	15850	1885412	119
Year 4	2009	15975	1754366	110
Year 5	2010	16330	1693187	104
Base Daily Per Capita Water Use[1]				120

After calculating targets using one of the four methods, the targets are compared to the minimum water conservation target required under Section 10608.22 of the Water Code.

Method 1: The 2020 water demand target is 80% of the baseline demand (**120 gpcd**). This method yields a target of **96 gpcd**.

Method 2: This method consists of establishing separate water demand targets for indoor water use, landscape water use and commercial, industrial and institutional (CII) water use. The indoor residential demand target is established in the legislation as 55 gpcd. Landscape water demand must meet the requirements of the Model Water Efficient Landscape Ordinance. CII water demand targets may be set at 10% below the baseline demand. In order to apply this method, detailed information is required for all irrigated landscapes (area, date installed, vegetation type, and metered or estimated water use). Because the City does not have this level of data available, this method was not used.

Method 3: The 2020 water demand target is 95% of the hydrologic region target. The City is in Region 3, Central Coast, which already has the lowest per capita water demand in the state. In the 20x2020 Water Conservation Plan, the baseline demand for the Region 3 was calculated as 154 gpcd, and the 2020 urban water use target is 123 gpcd. The Method 3 target is 95% of 123 gpcd, or 116.9 gpcd.

Method 4: This method is based upon estimating conservation savings using the CUWCC BMPs. The advantage of this method is that the CUWCC annual reports for 2015 and 2020 will serve as the interim and final compliance reports to DWR. A water

savings calculator (workbook) is used to estimate the potential savings from programs targets at indoor, outdoor and commercial, industrial and institutional (CII) use sectors. As with Method 2, additional data will be required to use this method. Specifically, landscape irrigation demands must be segregated from residential and CII demands. Because this level of information is not available, targets were not calculated using this method.

Maximum Conservation Target: This method consists of calculating a five-year average water consumption rate for a period ending not earlier than December 31, 2007 and not later than December 31, 2010. The 2020 conservation target must be less than or equal to 95% of the 5-year base daily per capita usage, which, as shown in table 9 above, is **120 gpcd** for the recommended baseline period ending December 31, 2010.

Using Method 1, the City may select the 80% target, since this meets the minimum 5% reduction requirement of the Water Conservation Act. The result of this analysis is a baseline period ending December 31, 2010. Utilizing the Method 1 approach, the City has established a **2020 conservation target of 96 gpcd**, and a **2015 interim target of 114 gpcd**.

3.4 Water Use Reduction Plan

To reduce per capita demands below the compliance targets, the City has three strategies, in addition to the on-going water conservation efforts. First, the City is in the process of determining feasibility of implementing an urban recycled water project for landscape irrigation. Once the recycled water line is installed, all projected landscaping demands are expected to be met through recycled water delivery for the purpose of irrigation. This alone would reduce the potable water demand per capita below the water conservation target for 2020. Additionally, the City would implement a conservation landscape watering schedule and adopt a financial incentive to reduce water use. The City will monitor annual water demand, and adjust incentive programs as needed to meet the conservation targets.

The use of recycled water to serve non-potable demands is a conservation measure recognized in the 20x2020 State Conservation Plan. As detailed in Section 4, the City plans to build a recycled water transmission line to carry recycled water to the City once the integrated water resources plan and feasibility study is completed from which a schedule can be set and funding attained.

4.0 Water System Supplies

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments [to 20 years or as far as data is available.]

4.1 Water Supply Sources

The City currently utilizes groundwater from the Salinas Valley Groundwater Basin as its sole potable water supply source. Recycled water is a potential new water source available to the City. The City of Greenfield is located approximately 95 miles south of San Jose, in the center of California's Salinas Valley, and is governed by a five-member elected City Council. The City owns and operates a public water system that supplies potable water to its approximately 16,000 residents.

Water Sources

The City of Greenfield's water source has historically been from groundwater resources, specifically the Salinas Valley Groundwater Basin. The City does not use surface water as a supply source. The City pumps groundwater from its three existing wells. One of the wells has been converted into a irrigation well for Patriot Park, while the other two wells are used for domestic production.

Water Supply

The City's water system contains two primary water production wells (well #1 and #6), one well converted to irrigation use, one water storage tank, a water booster pump station, and over 17 miles of water distribution pipelines. The combined capacity of the two domestic production wells is 4,760 AFY. Estimated water demand at build out requires three additional wells similar in capacity to the two existing wells. The City is currently in the process of constructing well #7, and it is expected to be operational in the near future.

Water Storage

The water system contains a 1.0 MG ground level water storage tank. This provides water for the booster pumping plant that provides the City its required water pressure. The City's 2005- 2025 Water CIP forecasts a build out storage need of 3.75 MG. The City is in the process of designing a 1.5 MG storage tank.

Water Distribution

The City's transmission and distribution pipelines vary from 4 to 16 inches in diameter and total more than 17 miles in length.

The SCADA system is programmed to use the water in the storage tanks down to fire protection levels before filling and only fill completely during periods of lowest use. The wells pump directly into the distribution system. Water not used to meet demands goes to fill reservoirs. The primary wells are far enough apart that they do not influence each other when pumping simultaneously. Any well can be used to meet demand anywhere in the City and to fill the reservoirs. The City rotates the use of the wells.

The Monterey County Water Resources Agency manages the Salinas Valley Groundwater Basin, but the basin is not adjudicated. There are currently no restrictions on how much water the City of Greenfield can pump, nor are any such restrictions expected in the future. The Salinas River Groundwater Basin (and all of the agencies within it), however, sat on the edge of adjudication in 1996-97 due to substantial saltwater intrusion near the coast. Ultimately local agencies were able to convince the State Water Resources Control Board that the local solution was the best option. This local solution eventually materialized as the Salinas Valley Water Project.

The City's water supply may be looked at in a variety of ways – there is the water supply available in the aquifer itself, the sustainable yield of the aquifer, discussed above, the water supply that the City has the capacity to pump, and the supply that it in fact pumps. The calculation to determine the amount of water available in the aquifer is described in Section 4.2, Groundwater.

The existing and projected ground water supply system of the City of Greenfield has been designed to produce water meeting the California Department of Public Health standards. The standards require that the groundwater well systems will be able to operate without the capacity of the largest well which allows the largest well to be out of service.

In addition to groundwater, the City of Greenfield will be evaluating the potential future use of recycled water. The details of these plans will be developed through a feasibility study to decommission their existing wastewater treatment plant and send the effluent via lift station and pipeline to the neighboring city's water reclamation facility versus a future expansion and upgrade of the existing facility at Greenfield. Additionally the City will develop an integrated master plan for all their water resources with sustainability and conservation at the forefront of the planning effort.

4.2 Groundwater

Greenfield falls within the Salinas Valley Groundwater Basin. The Basin follows the Salinas River, varying from 3 miles to 10 miles across and stretching through most of Monterey County. A map of the basin and its regions is shown in the basin is divided into four subareas: East Side, Pressure, Forebay, and Upper Valley. The City of Greenfield is in the Forebay Subarea, which has a total surface area of 94,000 acres. Greenfield draws its water from the unconfined shallow aquifer zone, and overdraft has not historically been a problem in the Forebay Subarea. Groundwater production for the City has steadily increased over time, and is projected to further increase in coming years as a result of new developments.

Infiltration in the Salinas River channel is the principal source of groundwater for the Salinas Valley Groundwater Basin. Flows from the Salinas River channel and its tributaries percolate through alluvial materials and porous geological structures, recharging the local aquifers. Overdraft in the basin has caused saltwater intrusion in areas closer to the coast, but has never been identified as a problem in the Forebay Subarea. While seawater intrusion does not directly affect the City of Greenfield, it is an issue for the Monterey County Water Resources Agency (MCWRA), which manages water resources throughout the county. The MCWRA Groundwater Management Plan was completed in May, 2006.

In the 2006 Salinas Valley Integrated Regional Water Management Functionally Equivalent Plan (IRWMP), it was estimated that the SVGB is in overdraft, with pumping exceeding recharge by up to 4% a year. This condition affects groundwater users in the Pressure Subarea along the coast, where seawater is intruding into the aquifer. The Salinas Valley Water Project, described below, will increase annual recharge and reduce well-pumping in the Pressure Subarea, and is expected to reduce or eliminate the overdraft condition. The overdraft condition does not affect groundwater users in the Forebay Subarea.

In order to best manage the groundwater basin, the MCWRA owns and operates the Nacimiento and San Antonio reservoirs, both on tributaries of the Salinas River upstream of Greenfield. These reservoirs serve several purposes, one of which is to ensure that farms throughout the valley can have water year-round, particularly in the summertime when most crops are grown but rain is scarce. To do this, the reservoirs store excess winter flows and release them in the summer so that the Salinas River can recharge the groundwater basin throughout the year.

In addition to the City of Greenfield, the City of Greenfield and local farmers also draw from the Forebay Subarea. Outside of the City's UWMP, there have been no attempts to

quantify the total amount of water available to Greenfield, and data on the subject is limited. In the UWMP, the total volume of groundwater available to the City is estimated to be 1,500,000 acre-feet based on a proportional percent of the total aquifer volume.

A more accurate way to analyze the water available to the City in any given year is to estimate the safe yield of the aquifer. The Salinas Valley Groundwater Basin (SVGB) is a regional resource that serves the majority of Monterey County. Annual usage varies with rainfall, but over the last decade groundwater use has ranged from 440,000 AFY to 527,000 AFY. Pumping from the Forebay Subarea accounts for 29% of the total groundwater use from the SVGB. Agricultural irrigation accounts for 91% of SVGB water use, and 95% of the water use within the Forebay Sub-Area. Urban use accounts for the remaining five percent.

Total pumping from the Forebay Subarea over the last decade ranges from 124,000 AFY to 161,000 AFY, with an average annual pumping of 149,000 AFY. Even during severe drought conditions, drawdown of the aquifer in the Forebay Subarea has generally been limited to 15 to 20 feet (see Section 5.1). In the IRWMP, the total use of groundwater in the Salinas Valley is projected to decrease as agricultural land is converted to urban use, which has a lower per acre water demand. Additionally, agricultural water demand is declining due to implementation of conservation methods. Although a sustainable yield has not been estimated for the Forebay Subarea, for the purposes of this report we will use the average usage rate of 149,000 acre-feet per year. Given the storage available in the aquifer, and the relative lack of impact that drought conditions have on water availability, this number is conservative.

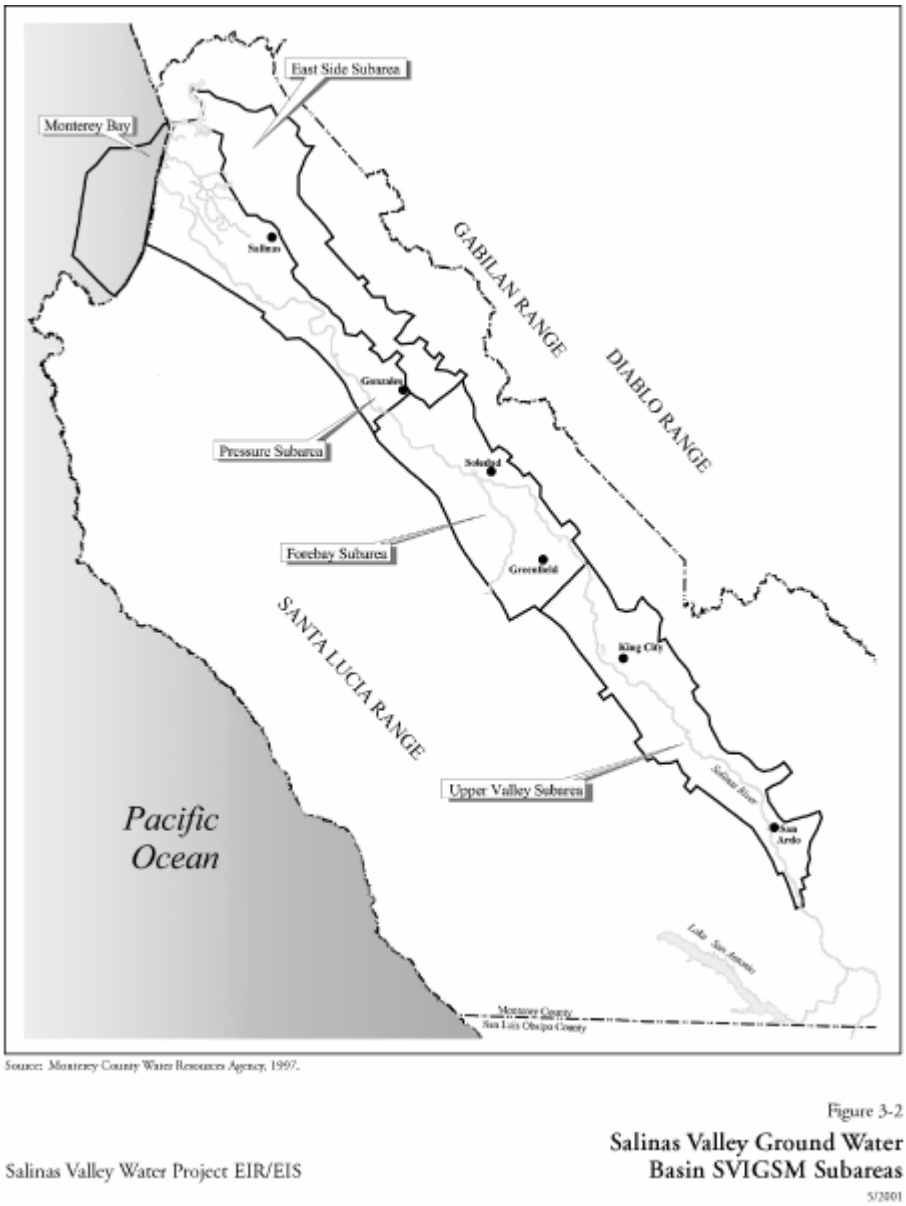
Table 10 illustrates projected pumped groundwater, which is significantly smaller than the amount available using the 148,000 acre-feet per year sustainable yield value. As described previously, currently 100% of the City's water supply is groundwater.

Table 10 Projected Groundwater Pumped

Table 10 Groundwater — volume projected to be pumped				
Basin name(s)	**2015**	**2020**	**2025**	**2030**
Forebay Subarea (Sustainable Yield)	148,000	148,000	148,000	148,000
City groundwater pumped	1984	2032	2085	2139
Percent of total water supply	1.3%	1.4%	1.4%	1.4%

Units : acre-feet per year

Figure 2: Salinas Valley Groundwater Basin

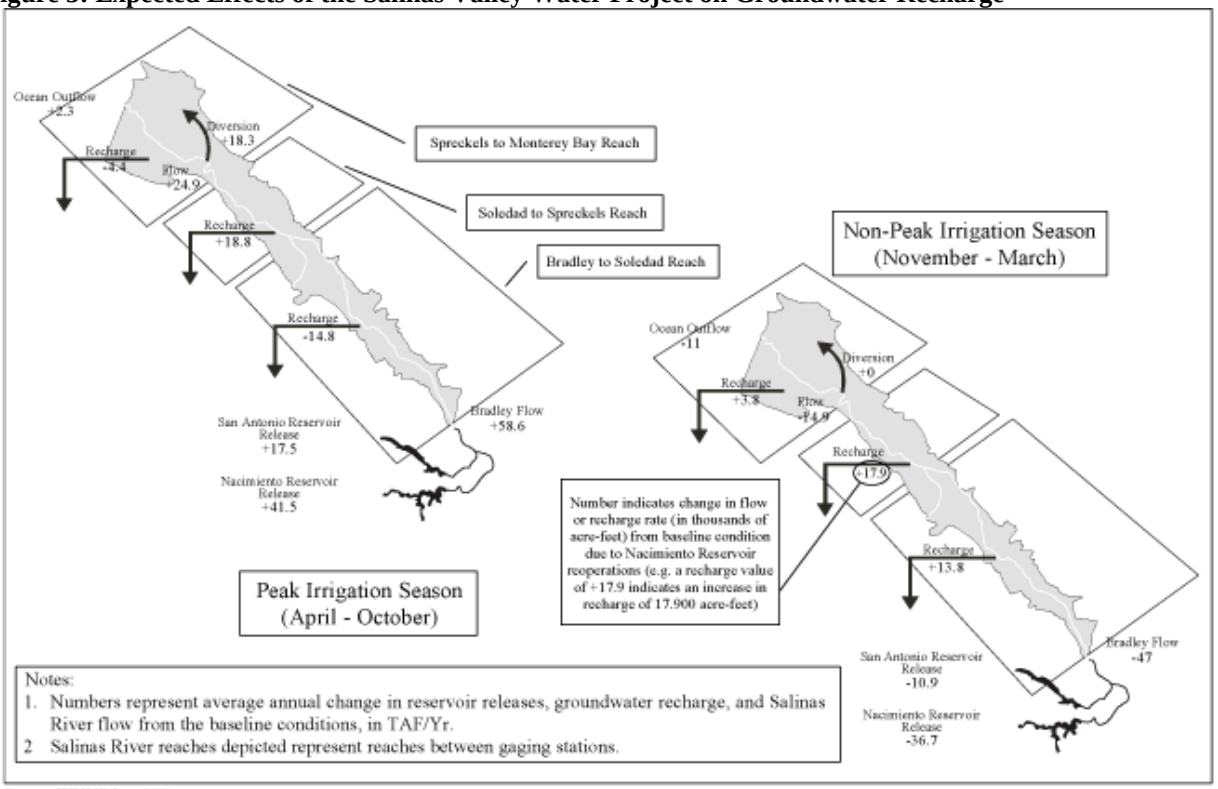


Source: Salinas Valley Water Project EIR/EIS

The Salinas Valley Water Project was completed in 2010 and is now operational. The project consisted of a modification of the Nacimiento spillway to allow for increased flow in the Salinas River throughout the summer. It also includes a rubber inflatable dam near the City of Marina that is operational during summer months to increase surface

water diversions for irrigation as a means to mitigate saltwater intrusion. The inflatable dam is downstream from Greenfield, however the altered reservoir releases are expected to increase recharge in the Forebay Subarea by approximately eighteen thousand acre-feet per year as shown in Figure 3.

Figure 3: Expected Effects of the Salinas Valley Water Project on Groundwater Recharge



Source: WRIME Inc., 2001.

Figure 5.3-34
Effects of Reoperation:
Future Baseline (2030) Compared to Future Plus Alternative A
Salinas Valley Water Project EIR/EIS
4/2001

4.3 Recycled Water

4.3.1 Wastewater System Description

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area…

The City of Greenfield Wastewater Treatment Plant (WWTP) is located easterly of the City along the westerly banks of the Salinas River at the easterly terminus of Walnut Avenue.

The WWTP was reconstructed and completed in 1978. Additional plant improvements completed in 1993 increased the capacity to 1.0 million gallons per day (MGD). The plant had some improvements completed after 2009 increasing the capacity to 2.0 MGD. The plant provides treatment and disposal of sanitary wastewater contributed by the residents of the City.

Wastewater treatment and disposal is accomplished in accordance with the Waste Discharge Requirements Order No. R3-2002 - 0062 that has been established by the California Regional Water Quality Control Board, Central Coast Region. This order allows the capacity of the facility to be increased upon submittal by the City and approval by the Board of documentation that sufficient improvements have been made to the facility for now.

The treatment process, generally considered primary treatment, is to remove a portion of the solids in the wastewater through a settling process. The solids collected are transferred to a basin in which they are reduced in a process know as aerobic digestion. After digestion, the solids are dried in a lagoon and then buried.

The basic disposal concept is to percolate all the wastewater into the ground in a manner that protects the public health, maintains or enhances the existing groundwater quality

and does not create a visual or odor nuisance. No wastewater effluent is discharged to any of the adjacent surface waters. The wastewater quantities are such that with the ample amount of land available, treatment and disposal of wastewater is quite simple and straightforward.

The major portion of the settleable solids are removed by settling in the primary sedimentation tank and then decomposed by aerobic digestion. The settled wastewater is then conveyed to a series of ponds where treatment of dissolved organic matter through a natural oxidation process occurs. Final effluent disposal is accomplished by percolation through the sandy soil into the ground, eventually reaching the groundwater underlying the area. In addition, a spray irrigation system with an estimated capacity of 1.0 MGD has been added to the disposal facilities.

The treatment facilities provide primary treatment for solids removal followed by oxidation and percolation.

The design of the major plant units generally follows conventional practice. The treatment structures are constructed of reinforced concrete and the pond embankments are constructed of compacted native soil. All wastewater flow through the plant is by gravity and the only process pumping used is for transferring sludge and scum from the sedimentation tank into the digestion tank. The plant water system includes a well on the plant site. Well water is pumped into a hydro-pneumatic tank.

According to a 2009 Wastewater System Capital Improvement Plan Update and Capacity Charge Study in 2009 the plant capacity was 1.0 MGD average daily flow. City has since made some capacity improvements and the facility now has a design treatment capacity of 2 MGD with disposal capacities 2MGD during high groundwater conditions. Future growth will require a capacity of about 3.5 MGD. The estimated cost of those improvements was $17,400,000 in 2009 that recommended the plant be upgraded to a water reclamation facility at a capacity of 4.0MGD. The City therefore intends to have an integrated water resources master plan developed that will look at alternatives to plant expansion and treatment upgrade prior to the requisite 2015 UWMP update.

COLLECTION SYSTEMS

The City wastewater collection system includes more than 110,000 feet of gravity wastewater pipelines, ranging in diameter from 6 to 24 inches and two large 0.4 mgd and four small sewage pump stations.

The wastewater collection system been extended over time as the City grew. Located in alleys and easements of the original downtown area, the sanitary sewer pipe is predominately 6-inch diameter clay pipe. New pipes in newer residential areas to the west and east of the downtown area tend to be 8-inch diameter polyvinyl chloride (PVC) pipe and are generally aligned in street right-of-ways. There is a network of trunk sewers greater than or equal to 12 inches in diameter that generally flow from west to east and discharge into the Greenfield Wastewater Treatment Plant at the eastern end of Walnut Avenue.

4.3.2 Recycled Water

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (a) A description of the […] methods of wastewater disposal.
>
> 10633 (b) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.
>
> 10633 (c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
>
> 10633 (d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.

The City of Soledad very recently completed an upgrade of the City Plant which, in addition to increasing plant capacity to 5.5 mgd, also treats wastewater to meet the waste discharge requirement effluent limits adopted by the State Water Resources Control Board of California as well as Title 22 standards for recycled water use.

Greenfield would send all or a portion of its wastewater to the Soledad Plant then return the recycle water to Greenfield for its application on landscape irrigation as one option after completion of a recycle water and wastewater feasibility study that would determine

whether it makes more sense for the City of Greenfield to expand the current wastewater treatment facility and upgrade it to a water reclamation facility or complete plans and improvements to send the wastewater to the Soledad water reclamation facility for treatment.

4.3.3 Recycled Water Currently Being Used

Additional infrastructure is required to deliver recycled water to potential users. Currently, all effluent from the City Plant is disposed of via rapid infiltration basins and spray field irrigation. This water then percolates back into the aquifer. The city does not currently directly re-use any of its treated wastewater.

4.3.4 Potential Uses of Recycled Water

The amount of wastewater currently disposed of (i.e. infiltrated) in the City of Greenfield is approximately 1,000 acre-foot annually. It is anticipated that once the mechanism for producing recycled water is installed, all projected landscaping demands will be met through recycled water delivery. This is the minimum amount of recycled water that may be required since it may be feasible and desirous to use recycled water for residential and commercial landscaping as well. However, a complete analysis of potential recycled water use demands is not available at this time.

4.3.5 Encouraging Use of Recycled Water

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

Once the City ascertains the appropriate approach to produce and distribute recycle water. The City will be pursuing funding to complete the infrastructure required to provide recycled water to existing residential, agricultural, and recreational uses. In

addition, the City of Greenfield intends to promote recycled water use by installing a reclaimed water distribution system in new residential developments. The use of recycled water through this "purple pipe" will be encouraged for outdoor water uses within the development, ensuring that the reclaimed water will be used. There is more uncertainty concerning the reclaimed water that will be distributed for agricultural purposes from the existing treatment facilities.

The City would adopt a recycled water ordinance once funding is acquired and a project timeline established. The ordinance would set forth the following City policies:

- Recycled water shall be encouraged for any and all purposes approved by State regulations for recycled water use.
- Recycled water will be the primary source of supply for commercial and industrial uses, whenever the City determines that such use is available and/or feasible.
- Recycled water shall be used within the jurisdiction of the City whenever and wherever there is not an alternative higher or better use for the recycled water and its use is consistent with legal requirements, preservation of public health, the safety and welfare of the public, and protection of the environment.

Table 11 Methods to Encourage Recycled Water Use

Methods	Methods Used
Subsidized costs	✓
Grants	✓
Dual Plumbing Standards	
Regulatory Relief	✓
Regional Planning	✓
Incentive Program	
Long-Term Contracts (Price/Reliability)	✓
Rate Discounts	✓
Prohibit specific fresh water uses	
Low interest loans	
Public education	
Other ("guarantee" recycled water supply reliability)	

4.3.6 Recycled Water Optimization Plan

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems and to promote recirculating uses.

The City's plans for optimizing recycled water use will be included in the integrated water resources planning effort.

4.4 Future Water Projects

Law

> 10631 (h) Include a description of all water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

The City does not plan to develop any new sources of water other than adding ground water wells and water storage, but it does intend to continue making upgrades and expansions to its current system to keep up with current and future development. This includes wells, generators, new distribution lines and pump stations, as summarized in the table below. These could me modified in the update of the 2009 Water Master Plan anticipated in year 2013 in the integrated planning effort.

RECOMMENDED CAPITAL IMPROVEMENT PROJECTS (CIP)

The recommended capital improvement projects are indicated in the table below.

Recommended Water System Capital Improvement Projects

Facility	Estimated Cost
Water Supply Wells	**$ 2,400,000**
Reservoirs	**$ 1,800,000**
Pump Stations	**$ 1,750,000**
Pipelines	**$ 6,948,000**
SCADA	**$ 300,000**
Total Construction Cost	**$13,198,000**
Contract Administration, Engineering & Contingencies	**$ 3,959,400**
Land Acquisition	**$ 100,000**
Total Capital Improvement Cost	**$17,257,400**
Administration (1.5% of total costs)	**$ 258,861**
Total Water Capacity Charge Costs	**$17,516,261**

Source: *City of Greenfield Executive Summary Water Capital Improvement Plan Update And Capacity Charge Study2009*

4.5 Other Water Supply Opportunities

Other water supply opportunities will be fully discussed in the Integrated water resources master plan that will be completed in 2013.

4.5.1 Transfer or Exchange Opportunities

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

The City does not currently buy or sell water to other agencies. The City has the potential to provide recycled water on a wholesale or retail basis to the state prison, local farms or nearby communities in the future. It is too early within the recycled water project to forecast external sales.

4.5.2 Desalination

There are currently no opportunities for development of desalinated water. The City is over 40-miles from the ocean and does not overlie a brackish groundwater source. Since the City has an abundant source of groundwater the transport of desalinated water is not expected to be necessary.

4.6 Water Quality

Law

> 10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

City water quality data can be seen in the table below. Contaminants of local concern are pesticides, Biochemical Oxygen Demand (BOD) and Total Dissolved Solids (TDS). The City also recognizes that pollutants of concern in common urban runoff may include sediments, non-sediment solids, nutrients, pathogens, BOD, petroleum hydrocarbons, heavy metals, floatables, polycyclic aromatic hydrocarbons (PAHs), trash, pesticides and herbicides. The City routinely tests all its wells to ensure that the groundwater pumped meets EPA and CDPH drinking water standards. The water quality of the primary wells is good and meets all standards.

Table 12 Water Quality Data

SUMMARY OF WATER QUALITY DATA FOR THE YEAR 2010 - WELLS 1, 6 AND 7

Primary Standards - Mandated Health Related Standards

Coliform Bacteria	Number of Detections	MCL	PHG	MCLG	Likely Source of Contamination
Total Coliform Bacteria (Total Coliform Rule)	0	No more than one positive monthly sample	0	0	Naturally present in the environment
Fecal Coliform Bacteria (Total Coliform Rule)	0	A routine sample and a repeat sample are total coliform positive, and one of these is also fecal coliform or E.coli positive	0	0	Human and animal fecal waste

Radioactive Contaminants	Violation Y/N	Level Detected	Range	Unit	MCL or [MRDL]	PHG	MCLG	Likely Source of Contamination
Gross Alpha particle activity	N	4.8	2.94-7.64	pCi/L	15	15	0	Erosion of natural deposits
Combined radium	N	0.52	ND-1.6	pCi/L	5	5	0	Erosion of natural deposits
Uranium	N	6.2	2-7.4	pCi/L	20	20	0.43	Erosion of natural deposits

Contaminant	Violation Y/N	Level	Range	Unit	MCL or [MRDL]	PHG	MCLG	Likely Source of Contamination
Inorganic Contaminants								
Arsenic	N	1.7	1-2	ppb	10	N/A	N/A	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Nitrate (as NO3)	N	12	ND-25	ppm	45	45	N/A	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Total Trihalomethanes	N	6.6	6.6	ppb	80	N/A	N/A	By-product of drinking water disinfection
Secondary Standards - Aesthetic Standards								
Color	N	0.7	ND-1	Units	15	N/A	N/A	Naturally occurring organic materials
Turbidity	N	0.12	ND-0.35	Units	5	N/A	N/A	Soil runoff
Total Dissolved Solids	N	523	371-715	ppm	1000	N/A	N/A	Runoff/leaching from natural deposits
Specific Conductance	N	772	550-1046	µS/cm	1600	N/A	N/A	Substance that form ions when in water; seawater influence
Chloride	N	45	18-81	ppm	500	N/A	N/A	Runoff/leaching from natural deposits; sea water influence
Sulfate	N	145	93-217	ppm	500	N/A	N/A	Runoff/leaching from natural deposits; industrial waste
Other Constituents								
Sodium	N	53	29-77	ppm	N/A	N/A	N/A	Generally found in ground and surface water
Total Hardness	N	17	14-22	Grains per Gallon	N/A	N/A	N/A	Generally found in ground and surface water

LEAD and COPPER	Samples	Percentile	# Of Sites	AL	PHG			Likely Source of Contamination
Lead (ppb)	120	ND	0	15	2	0.2		Typical source of contaminant; erosion of natural deposits
Copper (ppm)	120	0.312	0	1.3	0.3			Internal corrosion of household water plumbing systems; erosion of

Key to Table

ND: not detectable at testing limit
µS/cm: a measure of specific conductance
ppm: parts per million or milligrams per liter (mg/L)
ppb: parts per billion or micrograms per liter (ug/L)

: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. City of Greenfield is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Well 6 was not in service in 2010. It was down for maintenance and repairs.

5.0 Water Supply Reliability and Water Shortage Contingency Planning

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.
>
> 10631 (c) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.
>
> 10631 (c) Provide data for each of the following:
> (1) An average water year, (2) A single dry water year, (3) Multiple dry water years.
>
> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (b) An estimate of the minimum water supply available during each of the next
> three-water years based on the driest three-year historic sequence for the agency's water supply.

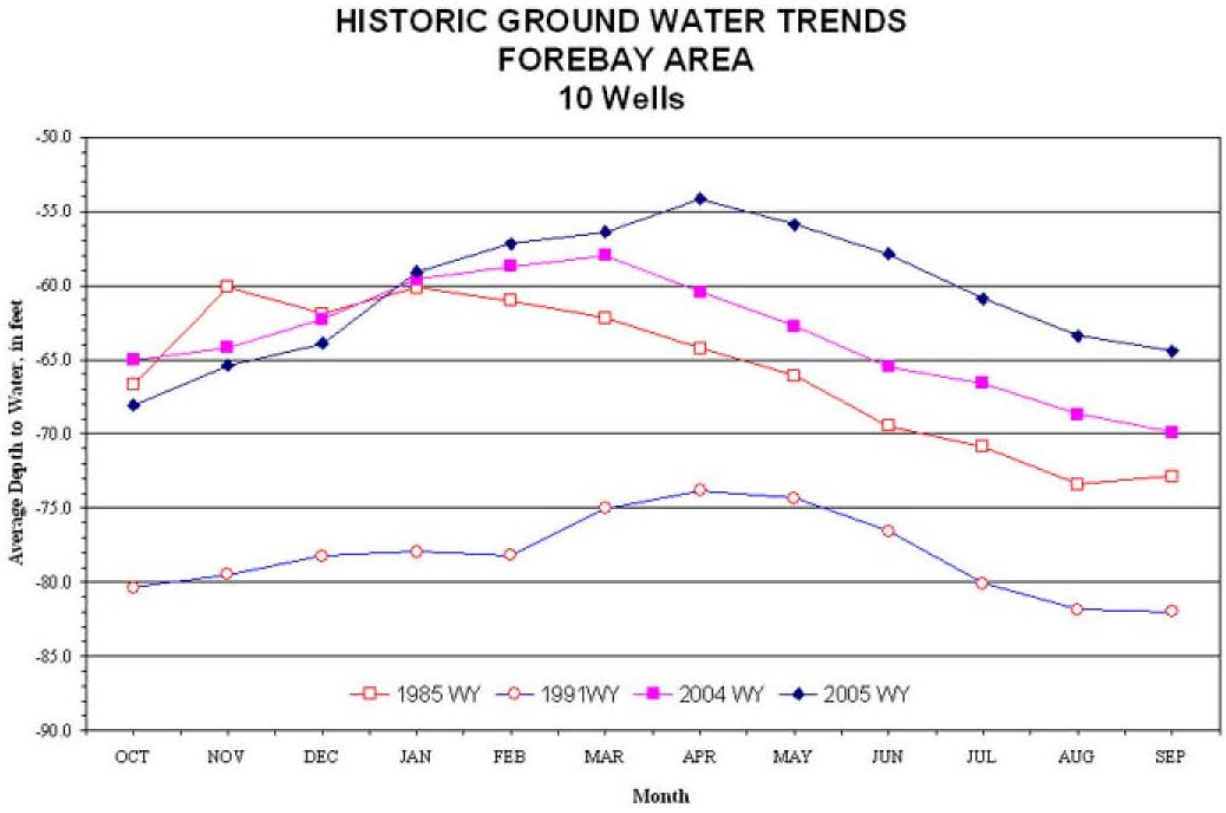
5.1 Water Supply Reliability

Greenfield falls in the Forebay Subarea of the Salinas Valley Groundwater Basin. The MCWRA reports that in all its years of measurement (since the 1950's), there has never been an instance of overdraft in the Forebay Subarea. Because Greenfield falls just downstream of the confluence of the Salinas River and Arroyo Seco, its groundwater levels are particularly high and no overdraft is expected in the future. In fact, due to the above, no safe yield number has ever been calculated for the Forebay Subarea.

Average depth to groundwater throughout the Forebay Subarea, where 1985 represents an average year and 1991 represents the final year of a three-year drought. While the groundwater table dropped between 90 and 100 feet in the areas near the coast, drawdown in the Forebay Subarea was generally limited to 15 to 20 feet. Since there is very little rainfall in the summer months, the groundwater table is generally ten feet

lower during the summer than during the winter as can be seen. Regardless, Greenfield's water supply has not proven vulnerable to seasonal changes.

Figure 4: Groundwater Trends



Source: MCWRA Website:

There are several factors that could yield an inconsistency of supply. Earthquakes are common in coastal California, and could potentially disrupt water supply. Contamination is also possible. The City's responses to the above are discussed in the City's Emergency Response Plan in Appendix C. There are currently no legal threats to Greenfield's access to its water supply.

Table 13 Factors That Could Affect/Impact Consistency of Supply

Table 13 Factors resulting in inconsistency of supply						
Water supply sources	**Specific source name**	**Limitation quantification**	**Legal**	**Environmental**	**Water quality**	**Climatic**
Groundwater	Forebay Area		None	Earthquake	Contamination	Drought

The total water volume available to the City was estimated as 1,500,000 acre-feet. As the culmination of a three-year drought, 1991 is the driest year on record, with the groundwater table lowered by about 15 feet. The period of 1989-1991 was thus considered representative of three subsequent dry years, with the water table dropping five feet per year. To determine the total quantity lost in a dry year, the fall in groundwater was multiplied by the surface area in question (24,600 acres) and then by a porosity value of 0.4. The following tables illustrate the aquifer supply reliability, and confirm the abundance of water supply available to the City far into the future, including during drought scenarios. Within the last decade, rainfall and pumping records are inversely proportional. Since the majority of water use in the forebay area is agricultural, this is logical. Despite this increased pumping during dry years, the ability to pump in subsequent years is unaffected, and drawdown levels of the aquifer have not been significant.

Table 14 Basis of Water Year Data

Table 14 Basis of water year data	
Water Year Type	**Base Year(s)**
Average Water Year	1985
Single-Dry Water Year	1991
Multiple-Dry Water Years	1989-1991

Source: MCWRA Website:

Table 15 Aquifer Supply Reliability

Table 15 Supply reliability — historic conditions					
Average / Normal Water Year	**Single Dry Water Year**	**Multiple Dry Water Years**			
		Year 1	**Year 2**	**Year 3**	**Year 4**
Aquifer Volume = 1,500,000	1,450,800	1,450,800	1,401,600	1,352,400	1,303,200
Sustainable Yield = 148,000	148,000	148,000	148,000	148,000	148,000
Percent of Average/Normal Year (sustainable yield):	100.0%	100.0%	100.0%	100.0%	100.0%

Table 16 Supply and Demand Comparison – Multiple Dry-Year Events

Table 16 Supply and demand comparison — multiple dry-year events					
		2015	**2020**	**2025**	**2030**
Multiple-dry year first year supply	**Supply totals (Sustainable Yield)**	148,000	148,000	148,000	148,000
	Demand totals	1,984	2,032	2,085	2,139
	Difference	146,016	145,968	145,915	145,861
	Difference as % of Supply	99%	99%	99%	99%
	Difference as % of Demand	7,360%	7,357%	7,355%	7,352%
Multiple-dry year second year supply	**Supply totals (Sustainable Yield)**	148,000	148,000	148,000	148,000
	Demand totals	1,984	2,032	2,085	2,139
	Difference	146,016	145,968	145,915	145,861
	Difference as % of Supply	99%	99%	99%	99%
	Difference as % of Demand	7,360%	7,357%	7,355%	7,352%
Multiple-dry year third year supply	**Supply totals (Sustainable Yield)**	148,000	148,000	148,000	148,000
	Demand totals	1,984	2,032	2,085	2,139
	Difference	146,016	145,968	145,915	145,861
	Difference as % of Supply	99%	99%	99%	99%
	Difference as % of Demand	7,360%	7,357%	7,355%	7,352%
Units: acre-feet per year					

5.2 Water Shortage Contingency Plan

5.2.1 Preparation for Catastrophic Water Supply Interruption

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

The City of Greenfield has prepared a Water System Emergency Response Plan (ERP). The purpose of the ERP is to provide the City of Greenfield with a standardized response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of natural or man-made origin.

The goals of the ERP are:

- Rapidly restore water service after an emergency.
- Ensure adequate water supply for fire suppression.
- Minimize water system damage.
- Minimize impacts and loss to customers.
- Minimize negative impacts on public health and employee safety.
- Provide emergency public information concerning customer service.

The City of Greenfield has considered the threats posed by natural events and weather related phenomena. Specific action plans AP(s) have been developed to guide a timely and prudent response should such threats be realized. These detailed APs are found in Appendix C. See table 17 for considered catastrophes.

Table 17 Preparation Actions for Catastrophe

Preparation Actions for Catastrophe			
Possible Catastrophe	**Check if Discussed**	**Primary AP No.**	**Secondary AP No.**
Natural Disasters			
Earthquake	✓		
Floods	✓		
Winter Storm	✓		
Hurricane	✓		
Power Outage	✓		

The City of Greenfield has developed specific AP documents. These AP documents are not included in Appendix C due to the sensitive and confidential nature of the information. They can be found in Appendix A of the City of Greenfield's Water System Emergency Response Plan, a confidential document kept at City offices.

Continued **Preparation Actions for Catastrophe**			
Possible Catastrophe	**Check if Discussed**	**Primary AP No.**	**Secondary AP No.**
Man-made Threats			
Threat of contamination to water system	✓		
Confirmed contamination to water system	✓		
Structural Damage from explosive device	✓		
Employee Assaulted with weapon	✓		
SCADA System Intrusion	✓		
IT System Intrusion	✓		
Chemical Release	✓		
Water Supply Interruption	✓		
Bomb Threat	✓		

5.2.2 Supplemental Water Supplies

The City of Greenfield's Water System ERP identifies alternate water resources, emergency water supply calculations and emergency equipment and supplies. The City of Greenfield has two alternate and independent raw water sources in the event of the failure of all four City wells, which is highly unlikely:

- Water Source 1: Ag well (s) near City (need details)
- Water Source 2: Salinas River

Each of these raw water services can supplement the water supply if the other sources are compromised. For additional information please refer to the City of Greenfield's Water System ERP.

5.2.3 Water Shortage Contingency Ordinance/Resolution

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (h) A draft water shortage contingency resolution or ordinance.

The City adopted Mandatory Water Conservation Regulations in 1995, which can be found in Chapter 13.09 of the City of Greenfield's Municipal Code and are attached as Appendix A of the adopted Water Shortage Contingency Plan. The City of Greenfield has developed a formal water-rationing plan consistent with the City's adopted Water Shortage Contingency Plan in Appendix D. Additionally a model resolution is included as Appendix B of the adopted Water Shortage Contingency Plan that will be adopted in the case of an impending water shortage.

5.2.4 Stages of Action

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage.

The City of Greenfield utilizes a five-stage rationing plan to invoke during declared water shortages. The rationing plan includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the water supply shortage.

Table 18 Rationing Stages

Table 18
Water shortage contingency — rationing stages to address water supply shortages

Stage No.	Water Supply Conditions	% Shortage
1	Levels in wells reach 220-235 feet below surface	5-10%
2	Levels in wells reach 235-250 feet below surface	10-20%
3	Levels in wells reach 250-265 feet below surface	20-30%
4	Levels in wells reach 265-280 feet below surface	30-40%
5	Levels in wells reach 280-300 feet below surface	40-50%

Levels in wells are recorded by the Distribution Operator on a semi-annual basis. In case of a water shortage (Stages 3 and higher), the levels will be recorded weekly.

Stage 1

Greenfield maintains an ongoing public information campaign consisting of distribution of literature, speaking engagements, monthly bill inserts, and conservation messages printed in the city's local newspapers. The City of Greenfield's Mandatory Water Conservation Regulations are in place.

Stage 2

This stage is voluntary for high commercial and industrial uses of water and mandatory for water use within the City's control, wherein a 50% reduction of potable water use is required in all parks, medians, and public landscaped areas. In addition, the public will be encouraged to participate in water conservation practices by changing their water use habits and installing water efficient devices in their homes. Outreach will primarily be through informational means including news media and water conservation literature. Per the residential health and safety water quantity calculations found below, habit changes alone result in a 26% reduction of total water consumption, while replacement of standard fixtures with conserving fixtures within the home can result in a 43% reduction.

Therefore, expected reduction due to these efforts far exceeds the required reduction at this level.

Table 19 Residential Health and Safety Water Quantity Calculation

Fixture	Non-Conserving	Habit Changes	Conserving Fixtures
Toilets	4 flushes x 6gpf 24 gpcd	3 flushes x 6gpf 18 gpcd	4 flushes x 1.5gpf 6.0 gpcd
Shower	6 min. x 4gpm 24 gpcd	4 min. x 4gpm 16 gpcd	6 min. x 2.5gpm 15 gpcd
Laundry	11 gpcd	9 gpcd	10 gpcd
Kitchen	9 gpcd	7 gpcd	8 gpcd
Total gcd	**68**	**50**	**39**

Source: Wastewater Rate Study and Municipal Code Chapter 13.09 (Conserving Fixture gpf/gpm data.)

Stage 3

At this level, the City would eliminate its public potable water uses (City landscaping) entirely. The City would also notify schools, developers, and industrial water users of a water shortage, encouraging them to conserve. With continued public outreach, habit changes and fixture replacements, the demand reduction at this level will again far exceed the amount required.

Stage 4

In order to supplement actions taken at the previous level, the City may temporarily increase water rates. Water rate increases will discourage use of water and prevent or defer installation of new landscaping. Additionally, further water use prohibitions will be required.

Stage 5

This level would represent a true critical water shortage. The City would pass their model resolution prescribing additional rate increases, prohibiting unmetered usage including fire hydrants, and placing a ban on water use for any and all irrigation.

Stages 1-5 are summarized in table 20.

Table 20 Water Shortage Contingency – Consumption Reduction Methods

Table 20 Water shortage contingency — consumption reduction methods		
Consumption Reduction Methods	**Stage When Method Takes Effect**	**Projected Reduction (%)**
Additional rate increases, prohibition of unmetered usage including fire hydrants, and ban on water use for any and all irrigation.	1	10%
Industrial and commercial - voluntary reduction. City - mandatory 50% reduction in all parks, medians, and public landscaped areas. Public - encouraged to participate in water conservation practices by changing their water use habits and installing water efficient devices in their homes.	2	20%
City will eliminate public landscaping water use entirely and notify schools, developers, and industrial water users of a water shortage, encouraging them to conserve.	3	30%
City may temporarily raise water rates to discourage water use.	4	40%
Additional rate increases, prohibition of unmetered usage including fire hydrants, and ban on water use for any and all irrigation.	5	50%

5.2.5 Prohibitions, Consumption Reduction Methods and Penalties

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
>
> 10632 (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption

reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

10632 (f) Penalties or charges for excessive use, where applicable.

The City of Greenfield's Mandatory Water Conservation Regulations (see Appendix D) includes current and ongoing restrictions and prohibitions on various wasteful water uses such as:

- Cleaning of Structures
- Cleaning of Surfaces
- Construction Activities utilizing water for cleanup or dust control
- Commercial Car Washes
- Fountains
- Leakage and Repair Program
- New Construction requiring water connection activation
- Public & Quasi-Public Entities
- Repair of Plumbing, Sprinkler and Irrigation Systems
- Retrofitting Existing Hotels and Motels
- Swimming Pools and Spas
- Use of Hydrants
- Visitor Serving Facilities
- Washing of Vehicles
- Water Spillage

Table 21 Mandatory Prohibitions by Stage

Table 21 Water shortage contingency — mandatory prohibitions	
Examples of Prohibitions	**Stage When Prohibition Becomes Mandatory**
Using potable water for street washing	Stage 1
50% reduction required in all parks, medians and public landscaped areas	Stage 2
All public landscaping water use	Stage 3
Unmetered usage such a fire hydrants	Stage 5

Current & Ongoing Procedures

1) In order to encourage cooperative efforts to achieve water conservation, it is the policy of the City of Greenfield to issue a written warning notice when an alleged violation is first noted. Such warning shall include an explanation of the alleged violation. Any individual provided with such notice will then be given an opportunity to correct the identified problem.
2) Any violation that occurs or continues from one day to the next shall be deemed a separate violation, for each day during which such violation occurs or continues to occur.
3) The fine for the first violation of this chapter shall be fifty dollars.
4) The fine for second violation and each subsequent violation of Municipal Code Chapter 13.09 within a period of twelve months, regardless of the specific section or subsection violated shall be one hundred dollars.

Shortage Stage Procedures

1) Issue a written warning notice when an alleged violation is first noted. Such warning shall include an explanation of the alleged violation. Any individual provided with such notice will then be given an opportunity to correct the identified problem.
2) If the violation is not corrected after one written warning notice, the City shall install a flow restrictive device on the service line of any customer observed by Greenfield's personnel to be using water for any non-essential or unauthorized use.
3) Repeated violations of unauthorized water use will result in discontinuance of water service.

These procedures are summarized in table 22.

Table 22 Water Shortage Contingency – Penalties and Charges

Table 22 Water shortage contingency — penalties and charges	
Penalties or Charges	**Stage When Penalty Takes Effect**
Penalty for excess use	Stage 1
Charge for excess use	Stage 1
$50 fine for first violation of Muni Code 13.09	Stage 1
$100 fine for subsequent violations of Muni Code 13.09	Stage 1
If violation is not corrected after one written warning notice, the City shall install a flow restrictive device on the customer's service line	Stage 1
Repeated violations will result in discontinuance of service	Stage 1

5.2.6 Revenue and Expenditure Impacts and Measures to Overcome Impacts

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier…
>
> 10632 (g) [An analysis of the impacts of each of the] proposed measures to overcome those [revenue and expenditure] impacts, such as the development of reserves and rate adjustments.

Imposing water restrictions on customers would have an impact on City revenues. The following table shows the estimated impacts on revenues resulting from implementing various levels of restrictions. Those impacts are detailed in Table 23.

Table 23 Revenue Impacts From Water Restrictions

Revenue Impacts From Water Restrictions		
Rationing Stage	**Revenue Reduction**	**Percent of Total Annual Revenue**
Stage 1 (5-10%)	$27,000	2.5%
Stage 2 (10-20%)	$54,000	5.0%
Stage 3 (20-30%)	$81,000	7.5%
Stage 4 (30-40%)	$108,000	10.0%
Stage 5 (40-50%)	$135,000	12.5%

Revenue reduction = percent decrease times projected normal revenue.
Based on a three month period of drought
Source: Finance Department

The City currently maintains a capital replacement reserve fund and has recently adjusted its user rates to include building an operating reserve amounting to $77,000 in its water operations budget in case of emergencies.

Under long-term drought conditions, it may be necessary to institute temporary increases to rates to cover increased operating expenses. One option that the City could utilize would be to adopt a surcharge or flat rate increase over a specific time period to cover increased operating expenses while under water shortage. This measure would allow the City to implement various levels of rate increases after City Council, by resolution, has declared a threatened shortage of funds due to water shortage or other emergency.

Conditions of drought and the implementation of water restrictions would also impact expenditures. Reduced availability of groundwater would produce higher energy bills. The difference in groundwater elevation would lengthen the pumping time required to produce the same amount of groundwater. A detailed study on how a drought would impact City expenditures has not been completed at this time.

5.2.7 Reduction Measuring Mechanism

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

Under normal water supply conditions, potable water production figures are recorded daily. Totals are reported weekly to the Water treatment Facility Supervisor. Totals are reported monthly to the Water Department Manager and incorporated into the water supply report.

During a Stage I or Stage II water shortage, daily production figures read from wellhead meters will be reported to the Utilities Department. The Supervisor compares the weekly production to the target weekly production to verify that the reduction goal is being met. Monthly reports will be sent to the City Council. If reduction goals are not met, the manager will notify the City Council so that corrective action can be taken. During a Stage III or Stage IV water shortage, the procedure listed above will be followed, with the addition of monitoring production figures by sector and furthermore by consumer.

During emergency shortages Stage V, production figures will be reported to the Supervisor hourly and to the Manager and the Water Shortage Response Team daily. Daily reports will also be provided to the City Council and the Monterey County Office of Emergency Services.

5.3 Drought Planning

As previously described (Section 5.1), the City water supply (i.e. water available in the aquifer) is significantly greater than the anticipated demand even during a multi-year drought scenario. As such, the City does not have specific drought planning measures other than what has been described in the mandatory water conservation and planning measures described above. That said, the City does employ several ongoing water conservation measures and is working towards utilizing significant amount of recycled water, as described elsewhere in this report.

6.0 Demand Management Measures

Law

> 10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
> (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:……..

The 2010 UWMP, the each required Demand Management Measure (DMM) is discussed in detail below. It is anticipated that in future Plan updates, the City will submit a copy of their annual report describing DMMs within the Plan to the California State Department of Water Resources. Further, each DMM is discussed following the table.

Table 24 Demand Management Measures and Implementation Schedule

DMM #	DMM Name	**Scheduled Implementation Start Date**	**Fully Implemented By Date**
1.	Water Survey Program	July 2013	July 2015
2.	Plumbing Retrofit	July 2013	July 2014
3.	Water System Audits	July 2013	July 2016
4.	Metering w/ Commodity Rates	April 2012	May 2012
5.	Large Landscape Program	July 2013	July 2014
6.	Washing Machine Program	July 2013	July 2014
7.	Public Information Program	July 2013	July 2015
8.	School Education Program	July 2013	July 2016
9.	Commercial, Industrial, Institutional Program	July 2013	July 2017
10.	Wholesaler Assistance	N/A	N/A
11.	Conservation Pricing	April 2012	May 2012
12.	Conservation Coordinator	July 2013	July 2014
13.	Water Waste Prohibition	December, 1993	December, 1994
14.	Residential ULFT Program	July 2013	July 2014

6.1 DMM 1 - Water Survey Program

The City is in the process of developing and conducting an indoor and outdoor water survey for single/multi-family residential customers. This effort is scheduled to begin in July 2013, and is anticipated to be complete by July 2015. The survey questionnaire is still in development, and shall include solicitation of information such as:

- Type and age of residence
- Number of connections to the water system
- Number of household individuals
- Specific to landscaping, description of area(s) broken down by grass, hardscape, landscape, and garden, approximate slope, type of irrigation and sprinkler heads used, and amount of shade.
- Description of in-home toilets, faucets, showers (including flow rate and leaks)
- Quantification of frequency and duration of showers, baths, washer and dishwasher loads, and car washes.
- Description of pool or spa.
- Amount of utility bills for past 12 months
- Whether or not the residence is a working home such as a day care.

The questionnaire will be posted to the City website by July 2013, with participation encouraged through announcements included in two consecutive utility billings. Also by August 2013 a procedure for reviewing and following-up on the responses will be developed.

Based on the existing conditions the City is projecting that at least 5% of returned surveys will retrofit their homes. Ultimately the surveys will be used to target households for outreach to receive conservation tips and suggestions specific to their household, resulting in lower overall water consumption. Effectiveness will be measured by comparing historic use with current use for those customers targeted. The following table represents water savings that may be achieved through this program:

Table 25 Typical Water Savings

	Pre-1980 Construction	Post-1980 Construction
Low-flow showerhead retrofit	7.2 gcd	2.9 gcd
Toilet retrofit (five year life)	1.3 gcd	0.0 gcd
Leak repair	0.5 gcd	0.5 gcd
Landscape survey (outdoor use reduction)	10%	10%

Table 26 Projected Water Survey Program Savings

Planned Measures	2013	2014	2015
Number Single Family Surveys	1,000	1,000	1,132
Number Multifamily Surveys	86	86	86
Projected Expenditures ($)	$1,000	$1,100	$1,800
Projected Water Savings(AFY)	-	0.24	1.72

6.2 DMM 2 - Plumbing Retrofit

The City began developing their plumbing retrofit program in 1994 under Chapter 13.09 Municipal Code Requirements. Under code regulations, retrofitting of toilets and showerheads is required upon change of ownership or use for existing residential structures, while retrofitting of toilets is required upon change of ownership or use for existing commercial and industrial structures. Additionally, the City is currently beginning implementation of an ULFT program as described under DMM 14 – Residential ULFT.

Utilizing DMM 1, the City will be able to track which homes are lacking water saving devices so that it is flagged during the transfer of ownership and/or change of use process. Each year the number of homes without conserving fixtures will decrease. This program may go into effect immediately once returned water surveys are processed, or no later than beginning July 2013.

Utilizing internal resources (city housing data), the City may determine the number of pre- and post-'94 homes (consistent with construction stipulations per the City's Municipal Code Section 13.09) so that the City may additionally target 5% of the pre-1994 single family homes and multi-family homes every two years for showerheads and ultra-low flush toilet replacements. Of the 2.5% targeted each year, the City is assuming that half will require retrofit. Typical water savings from Table 14A is used in this analysis. The City has not tracked the number of Pre-1992 single and multi family residential accounts thus far; as described above, a distinction will be determined (albeit for the year 1994 used as the cutoff since this is consistent with when the City's retrofit ordinance went into effect) and utilized in the future for this DMM.

Table 27 Projected Plumbing Retrofit Savings

Planned Measures	2013	2014	2015
Number Single Family Devices	-	116	131
Number Multifamily Devices	-	26	32
Projected Expenditures ($)	$1,500	$1,800	$1,900
Projected Water Savings(AFY)	0.00	1.53	1.70

6.3 DMM 3 – System Water Audits, Leak Detection and Repair

Per the requirements stipulated in the City Municipal Code Chapter 13.09, the Public Works Director shall maintain in effect a distribution system leakage detection and repair program. The City will initiate this program in July 2013, and the System Audit is anticipated to be completed in July 2016.

As part of this program, the City will adjust SCADA software and install new water meters which track water use and flags users with significant increases in their water usage. The City is in the process of developing a program of investigating and communicating with the owners of these flagged accounts to detect if a leak is occurring and initiate repair measures.

Additionally, the City has appointed the Maintenance Department to handle and schedule physical audits and repairs. The Maintenance Department will be developing a system for implementing testing agents within the distribution pipelines to determine where specifically a leak exists when the physical audit indicates a substantial (greater than 6%) loss. Discovered leaks will then be slated for repairs, although thus far the audit has not discovered any significant leaks within the system.

Documentation of each incidence and/or detected leak will be kept along with the date repairs are made. Once a repair is made, a minimum of two month's follow up of well production versus use data will be tracked to determine the total amount of water savings through said repair.

The auditing system would be automated for efficient tracking via the SCADA once installed in 2016. Annual reviews shall be conducted. Effectiveness will be evaluated by seeing a marked decrease in losses each year until losses fall below the threshold 6% value. The Public Works Director will submit annual reports to the City Council, per Code requirements. Ultimately the City will see an estimated savings of 150 AFY once the 6% threshold is reached.

In order to project system needs without having formal audit information to work off of, the City anticipates that for each of the planned implementation years, the primary (and necessary) focus will be on the lines located mainly in the older part of town that exhibit the most deterioration of the system. It is anticipated that 10% of all lines will be surveyed each year, and 50% of those lines will require replacement until the 6% threshold is achieved (approximated to occur by 2016 per table below).

Table 28 Projected Water Audits, Leak Detection and Repair Savings

Planned	2013	2014	2015	2016
% of unaccounted water	13%	9%	4%	4%
Miles of main surveyed	0.39	0.39	0.39	0.39
Miles of lines repaired	0.19	0.19	-	-
Projected Expenditures ($)*	$2,632	$2,709	$2,785	$2,862
Projected Water Savings(AFY)	18.21	21.47	-	-

Table 28 does not include the costs of design or construction of system repairs or Capital improvements.

6.4 DMM 4 – Metering with Commodity Rates

The City is fully metered for all customer sectors, including separate meters for single-family residential, commercial, large landscapes, and all institutional/governmental facilities. Implementation of DMM 4 will began in April 2012 with a physical reading of all operational meters for water auditing purposes. The City requires meters for all new connections. Water billing is based on volume of use pursuant to the newly adopted water rates. Table 29 details the rates adopted in April 2012.

The savings generated from these rates cannot yet be quantified. With the implementation of the new rates starting in May 2012 one full year of reduced water usage can be recorded in May of 2013 and again in the following year. From this data actual water savings will then be calculated and reported as part of the annual report to the California Department of Water Resources.

Table 29 Water Rate Structure

Monthly Service Charges	Prevailing Rates	Proposed Adjustments to Rates				
		2011/12	2012/13	2013/14	2014/15	2015/16
Projected Revenue from Rates	$900,000	$1,080,000	$1,296,000	$1,555,200	$1,664,064	$1,780,607
Annual Change	-	20.00%	20.00%	20.00%	7.00%	7.00%
Average Monthly Bill - Single Family Home (1)	$16.89	$20.27	$24.32	$29.19	$31.23	$33.42
Rates for Customers Within City Limits:						
Base Service Charge:						
5/8 x 3/4" meter	$7.59	$9.11	$10.93	$13.12	$14.03	$15.02
1" meter	$8.46	$10.15	$12.18	$14.62	$15.64	$16.74
1 1/2" meter	$10.48	$12.58	$15.09	$18.11	$19.38	$20.73
2" meter	$12.46	$14.95	$17.94	$21.53	$23.04	$24.65
3" meter	$26.83	$32.20	$38.64	$46.36	$49.61	$53.08
4" meter	$32.93	$39.52	$47.42	$56.90	$60.89	$65.15
6" meter	$86.05	$103.26	$123.91	$148.69	$159.10	$170.25
Variable Consumption Rater per 1,000 gallons:						
0 to 5,000	$0.40	$0.48	$0.58	$0.69	$0.74	$0.79
5,001 to 10,000	$0.65	$0.78	$0.94	$1.12	$1.20	$1.29
10,001 to 15,000	$0.81	$0.97	$1.17	$1.40	$1.50	$1.60
15,001 to 20,000	$0.95	$1.14	$1.37	$1.64	$1.76	$1.88
20,001 to 25,000	$1.00	$1.20	$1.44	$1.73	$1.85	$1.98
25,001 and up	$1.50	$1.80	$2.16	$2.59	$2.77	$2.97
Monthly Base Service Charge for Fire Protection Services:						
1 1/2" meter	$7.96	$9.55	$11.46	$13.75	$14.72	$15.75
2" meter	$9.38	$11.26	$13.51	$16.21	$17.34	$18.56
3" meter	$10.60	$12.96	$15.55	$18.66	$19.97	$21.37
4" meter	$12.22	$14.66	$17.60	$21.12	$22.59	$24.16
6" meter	$15.50	$18.60	$22.32	$26.78	$28.66	$30.67
Water Usage Rates for 3-inch Fire Hydrant Meter						
For first 9,000 gallons	$48.50	$58.20	$69.84	$83.81	$89.67	$95.95
For each 1,000 gallons above 9,000 gallons	$1.28	$1.54	$1.84	$2.21	$2.37	$2.53
(Deposit is two times the usage fee)						
Rates for Customers Outside City Limits:						
Base Service Charge:						
5/8 x 3/4" meter	$15.18	$18.22	$21.86	$26.23	$28.07	$30.03
1" meter	$16.92	$20.30	$24.36	$29.24	$31.28	$33.48
1 1/2" meter	$20.96	$25.15	$30.18	$36.22	$38.75	$41.47
2" meter	$24.92	$29.90	$35.88	$43.06	$46.08	$49.30
3" meter	$53.66	$64.39	$77.27	$92.72	$99.22	$106.16
4" meter	$65.86	$79.03	$94.84	$113.81	$121.77	$130.30
6" meter	$172.10	$206.52	$247.82	$297.39	$318.21	$340.49
Variable Consumption Rater per 1,000 gallons:						
0 to 5,000	$0.82	$0.98	$1.18	$1.42	$1.52	$1.62
5,001 to 10,000	$1.30	$1.56	$1.87	$2.25	$2.40	$2.57
10,001 to 15,000	$1.62	$1.94	$2.33	$2.80	$3.00	$3.21
15,001 to 20,000	$1.90	$2.28	$2.74	$3.28	$3.51	$3.76
20,001 to 25,000	$2.00	$2.40	$2.88	$3.46	$3.70	$3.96
25,001 and up	$3.00	$3.60	$4.32	$5.18	$5.55	$5.94
Monthly Base Service Charge for Fire Protection Services:						
1 1/2" meter	$12.22	$14.66	$17.60	$21.12	$22.59	$24.18
2" meter	$15.50	$18.60	$22.32	$26.78	$28.66	$30.67
3" meter	$18.23	$21.88	$26.25	$31.50	$33.71	$36.07
4" meter	$21.60	$25.92	$31.10	$37.32	$39.94	$42.73
6" meter	$27.81	$33.37	$40.05	$48.06	$51.42	$55.02
Water Usage Rates for 3-inch Fire Hydrant Meter						
For first 9,000 gallons	$97.17	$116.60	$139.92	$167.91	$179.66	$192.25
For each 1,000 gallons above 9,000 gallons	$2.58	$3.10	$3.72	$4.46	$4.77	$5.10
(Deposit is two times the usage fee)						

1) Average monthly bill based on consumption of 15,000 gallons and a 5/8 x 3/4" meter

6.5 DMM 5 – Large Landscape Water Audits and Incentives

A large landscape water auditing and incentive program will be developed by the City that includes irrigation surveys solicited of the City's large landscape customers (to be defined as three acres or greater). The program will incorporate calculations of water budgets for the site based on the size of the landscape and the climate, and compared against the water allotment for that site. Any water use which exceeds the water budget

may be billed at a higher rate. This would take an additional change in the water rates to implement. On-site follow-up evaluations will be recommended for customers whose annual water use exceeds their water budget.

This program will bee initiated in July 2013and will be implemented over the next five years. The City projects they'll conduct 12 surveys for developing site-specific budgets in the year of 2014. The follow up inspections will start in 2015.

It is projected that the landscape areas maintained by the Landscape Assessment District will be part of this DMM. Several parks and landscape strips are included in the landscape Computer programs such as AutoCAD and GIS will be used to project the areas covered by the large landscape customers within the City limits.

It is expected that large sized landscapes upgraded based on survey recommendations could result in a 15% reduction in water demand.

Table 30 Projected Large Landscape Conservation Program & Incentive Water Savings

Planned	2013	2014	2015	2016	2017
Number of Surveys Completed	6	5	0	0	0
Number of Budgets Developed	6	5	0	0	0
Number of Follow-up Visits	0	0	11	11	11
Projected Expenditures ($)	$1,300	$1,200	$1,200	$1,200	$1,200
Projected Water Savings(AFY)	11.0	23.0	26.0	30.0	33.0

With construction of the infrastructure necessary to connect existing 'purple pipe' to the future recycle water supply, the City anticipates replacing potable water with recycled water for all of the City owned landscape area, and many of the private landscaped areas as well. These water reductions have not been included in Table 30, since the Recycled Water potential has not yet been fully quantified.

The City will also investigate the existence of a nearby California Irrigation Management Information System (CIMIS) weather station where daily climatological data (temperatures, relative humidity, wind velocity, and precipitation) are documented. This data may ultimately be used to develop irrigation schedules that will help to maximize water use by adjusting timing, quantity, and frequency of watering.

6.6 DMM 6 – Washing Machine Rebate

The City is evaluating developing their washing machine rebate program. The City recognizes that high-efficiency washers use approximately 25 gallons per load, versus 40 to 50 gallons per load for top loader machines. The washing machine is the second

biggest water-user in most households; only the toilet will use more water (see below table). The next washing machine you buy will have an enormous effect on the amount of water you'll use over the next 10 years. The City proposes to provide customers with a **$100 rebate** on their water bill when a customer purchases a qualifying high-efficiency washing machine. Similar to the toilet rebate, a customer must complete a rebate form.

Table 31 Typical Municipal Water Use in USA

Device	Percentage
Shower	21.20%
Faucet	11.70%
Toilet	28.40%
Clothes- Washer	21.20%
Toilets Leaks	5.50%
Baths	8.95%
Dishwashers	3.10%

The City proposes to develop the rebate form and a list of washing machines that qualify under this program. The program should be developed by July 2013, pending Council approval. At this time, the City anticipates offering 50 rebates per year to its customers depending upon each year's budgets. As a starting point, 95% of single family homes are assumed to own washing machines; of those it is expected that 30% are energy-efficient. Likewise for multi-family homes, 65% are assumed to own washing machines; of those it is expected that 5% are energy-efficient.

Table 32 Projected High-Efficiency Washing Machine Rebate Programs Water Savings

Planned	2013	2014	2015	2016	2017
$ per Rebate	$100	$100	$100	$100	$100
Projected Number of Rebates to be Paid	50	50	50	50	50
Projected Expenditures ($)	$5,000	$7,281	$7,866	$8,089	$7,917
Projected Water Savings(AFY)	0.00	33.50	33.50	33.50	33.50

6.7 DMM 7 – Public Information

The City is currently implementing a public information program newly developed as an element of the City's UWMP. It is anticipated that through education on water usage and saving tips that there would be a reduction in water used and influent to the wastewater plant. Public outreach includes the following:

Utility Bills

Monthly utility bills are sent to each customer in the City. Included as part of the billing process is the ability to include a short notice (less than 32 characters) on each bill. The City will utilize this space to include water conservation messages on each of the utility bills in both English and Spanish. Below is a listing of past and potential future messages:

1. We need your help to conserve
2. Help conserve, use less water
3. Fix toilet leaks & save water
4. Less flushes reduces flow
5. Wash full loads of clothes
6. Install low flow devices
7. Quick showers, flush less
8. Don't waste, conserve water
9. Don't throw trash in toilets
10. Fix dripping water/shower faucets
11. Capture tap water/ reuse on plants

Articles in Local newspaper

As part of the process to inform the public as to the City's water supply situation and conservation efforts, the following will be done:

1. Articles run in English and Spanish on the City situation and its effects on the public and growth.
2. Monthly articles are run updating the public as to the City's situation.
3. Weekly factoids are run on tips to reduce flow to the Wastewater Treatment Plant.

Articles in Local newspaper

Another outreach effort is to inform the public as to the City's situation via the local paper:

1. An article is run in English and Spanish with tips to reduce flow to the plant. (To be run each first quarter newsletter)
    a. Installation of low flow equipment.
    b. Installation of hot water recirculating unit

2. Quarterly articles are run each second quarter updating the public as to the City's situation and reiterating tips to reduce flow to the plant.

Public Outreach

Varied methods to inform the public on the developed Integrated Water Resources Planning effort that will detail future Wastewater Plant Upgrades/Decommissioning, Recycle Water Efforts, Storm Water Plans and Water System Plans and upgrades, and methods they can take to help the situation will be implemented, including:

1. A power point presentation on the City's situation. City Staff present to different non-profit organizations, businesses and schools each month.
2. Door hangers will be made with information on the City's situation and tips on how citizens can help reduce flow to the plant.
    a. Use of High School Students to deliver
    b. Use of CSUMB students to deliver
3. Tips will be continuously posted to reduce flow to plant on Greenfield's Local Channel.
    a. Rather than having all tips Staff will create "Tip of the Week" and change the tip each week.
4. Information will be placed on the City's website with links on conservation measures.
5. Direct mailings to all citizens on conservation measures will be initiated during drought conditions.

The City will track the commentary regarding the information provided, and effectiveness will be gauged by increased awareness.

Projected costs shown in the below table are based upon approximate amount of time required of Staff as well as associated materials and expenditures.

Table 33 Projected Public Information Program Expenditures

Planned Outreach	2013	2014	2015	2016	2017
Paid Advertisement - News Paper (ea)	12 $581	12 $598	12 $616	12 $633	12 $650
Public Service Announcement - Local TV Channel (ea)	52 $807	52 $831	52 $855	52 $879	52 $810
Utility Bills Announcements (ea)	12 $255	12 $262	12 $270	12 $278	12 $285
Other newspapaer articles announcements (ea)	4 $509	4 $525	4 $540	4 $555	4 $570
Door Hangers with information & Tips (ea)	1 $592	1 $610	1 $628	1 $646	1 $664
Presentations at Business & Non-profit organizations (ea)	12 $1,535	12 $1,581	12 $1,627	12 $1,673	12 $1,719
Brochures (ea)	1 $326	1 $336	1 $346	1 $355	1 $365
Direct Information send to customers (ea)	1 $1,991	1 $2,051	1 $2,111	1 $2,170	1 $2,230
Web Information (ea)	4 $933	4 $961	4 $989	4 $1,017	4 $1,045
Projected Expenditures $	**$7,529**	**$7,755**	**$7,981**	**$8,207**	**$8,432**

6.8 DMM 8 – School Education

The City will be working on a school education program to promote water conservation and water conservation related benefits by the fall of 2013. The City will develop educational materials such as water conservation posters and classroom presentations. The City plans to put on water conservation programs for elementary school children beginning in 2013. They plan to visit 3rd to 5th grade classrooms on a quarterly basis. Once an elementary school water conservation program is established additional water conservation programs will be developed to include grade appropriate materials for middle and high school students. The City plans to have a complete school education program in place by the 2016 school year. All materials prepared for distribution or presentation to the students will be from an approved source, such as from the California Environmental Protection Agency's website or other.

Table 34 Projected School Education Program Expenditures

Projected	# Classes/Periods	2013	2014	2015	2016	2017
Grades 3rd - 5th	**45**	2	2	2	2	2
Grades 6th – High School	**26**				1	1
Projected Expenditures $		**$1,450**	**$1,500**	**$1,540**	**$1,550**	**$1,600**

In order to evaluate the effectiveness of this program the City will survey the institutions and educators on the number of programs, materials and attendance at water conservation activities.

The City has no method to quantify the water savings associated with this DMM but believes that this program is in the public's interest, and that awareness alone will result in significant savings.

6.9 DMM 9 – Commercial, Industrial, and Institutional Water Conservation

The City is fully metered for all customer sectors, including commercial, industrial and institutional accounts. (The reader is directed to Table 29 for a breakdown of accounts by sector.) The City began developing their plumbing retrofit program in 1994 under Chapter 13.09 Municipal Code Requirements (Included in Appendix D), however has not been well documented. Under code regulations, retrofitting of toilets is required upon change of ownership or use for existing commercial and industrial structures. In order to accelerate this process the City will implement an Accelerated Fixture Replacement Program (AFRP).

The City will utilize the survey results from DMM 1 to identify and rank commercial, industrial, and institutional accounts that will be targeted to participate in the AFRP. It is projected that 15% of commercial, industrial, and institutional accounts will return their surveys, and at least 5% of the owners of those returned surveys will retrofit. Incentive Programs will be evaluated once water saving success is measured with those DMMs targeting rebate programs for fixture replacements.

The AFRP will accelerate replacement of existing high water using toilets with ultra low flush (1.6 gallons or less). The number of commercial, industrial and institutional accounts with water conserving fixtures is expected to increase annually. The City will

begin implementing this DMM in 2013 with an annual target rate of 5% increase in use of water conserving fixtures for at least the next five years.

The City will evaluate the effectiveness of this DMM by annual review of customers' water use, and by offering on-site follow-up evaluations to customers whose total water use exceeds their total annual water budget. Projected expenditures for DMM 9 are illustrated at table 35.

Table 35 Projected Commercial, Industrial, and Institutional Water Conservation Program Savings

Planned Measures	2013	2014	2015	2016	2017
Number of Surveys Completed	15	15	16	18	20
Projected Incentives?*	No	No	No	No	No
Number of Follow-up Visits	-	15	15	16	18 No
Projected Expenditures ($)	$400	$405	$410	$415	$420
Projected Water Savings(AFY)	-	0.85	1.7	3.5	7.0

*City will evaluate water saving success of DMM 6 & DMM 14 in considering appropriate incentive options

6.10 DMM 11 - Conservation Pricing

The City is fully metered for all customer sectors, including separate meters for single-family residential, commercial, large landscapes, and all institutional/governmental facilities. The City has a tiered water use rate structure put into effect in 2012. More information is found under DMM 4.

Water savings effectiveness will be measured through periodic review of customer water use, comparing current water use per capita with historic data.

New wastewater and water service rate charges for the City of Greenfield was implemented in 2012. Appendices E & F show the breakdown for each category for the newly adopted rates for water and wastewater rate increases that the City has implemented.

6.11 DMM 12 – Conservation Coordinator

Conservation Coordination efforts will be overseen by the Public Works Department. The City has designated the Public Works Director as the Water Conservation Coordinator. The Director is currently Dale Lipp. Duties for the Conservation Coordinator position include, but are not limited to, the following:

- Coordination and oversight of conservation programs, DMMs and BMP implementation.
- Keeping a log of conservation practices conducted throughout the City and point person(s) assigned to each area.
- Acting as the point of contact to the Public for general inquiries and requests for information.
- Preparation and submittal of the Council BMP Implementation Report
- Communication and promotion of water conservation issues to City senior management; coordination of City conservation programs with operations and planning staff; preparation of annual conservation budget; participation in the Council, including regular attendance at Council Meetings.

It is projected that the Conservation Coordinator will spend 3% working in this capacity. The City is anticipating that only one Conservation Coordinator will manage and enforce the water demand management measures.

Table 36 Projected Water Conservation Coordinator Expenditures

Projected	2013	2014	2015	2016	2017
Number of Full Time Positions	0	0	0	0	0
Number of Part Time Positions	1	1	1	1	1
Projected Expenditures $	$3,000	$3,000	$3,000	$3,000	$3,000

6.12 DMM 13 – Water Waste Prohibition

The City established mandatory restrictions on water waste in 1994 that require repair of plumbing, sprinkler, and irrigation systems within seventy-two hours after such the property owner first learns of the problem in their Municipal Code Chapter 13.09

(Appendix D). The regulations stipulated therein are actively enforced through issuance of warnings and penalties.

The City has not formally tracked expenditures for administering to their waste ordinance to this point. The City has budgeting an annual staff cost of $3,000 for expenditures for administering the existing waste ordinance. See table 37 below.

Table 37 Projected Water Waste Prohibition Expenditures

Projected	2013	2014	2015	2016	2017
Waste Ordinance in effect?	Yes	Yes	Yes	Yes	Yes
Projected Number of On-Site Visits	12	12	12	12	12
Projected Expenditures $	$3,000	$3,000	$3,000	$3,000	$3,000

6.13 DMM 14 – Residential Ultra-Low Flush Toilet Replacement

Please see DMM 2 discussing the regulations in place for replacing toilets to ULFT's upon change of ownership or use. In addition, the City plans to develop a residential ultra-low flush toilet replacement program wherein single family and multifamily owners are eligible to receive a rebate on their water bills, for replacement of a 3.0 gpf toilet with a ULFT (1.6 gpf), in an established amount per toilet. – To be eligible for a rebate the property owner is solely responsible for purchase of toilet, installation arrangements, and payment. A Rebate certification form must be completed and returned to the City by the proposed expiration date to be valid. As a condition of the rebate, customer agrees not to alter the toilets and/or showerheads in order to increase the flow of water through the fixtures. Customer must agree to allow City inspector access to verify installation if selected for random inspection. Lastly, customer agrees that rebate(s) will be through credit(s) on his/her water bill over a two billing cycle. In all cases, customer should ensure funds are available for a rebate by calling City Hall Public Works Department before replacing toilet(s).

The program will be initialized by July 2013, and fully implemented by July 2014. The City is projecting that 50 rebates will be available for the customers pending Council approval. Half of the rebates will be available for single family and the other half for multi family customers. Information on the program will be advertised in the local newspaper.
Table projects the future water savings that will be achieved by the replacement of a 3.0 gpf toilet with a ULFT.

Table 38 Projected Ultra-Low-Flash Toilet Replacement Program Expenditures

Planned Measures	2012	2013		2014		2015		2016	
		Single Family	Multi Family	Single Family	Multi Family	Single Family	Multi Family	Single Family	Multi Family
Number of ULF Rebates	-	38	13	38	13	38	13	38	13
Number of ULF Customer Installs	-	38	13	38	13	38	13	38	13
Number of ULF CBO Installs	0	0	0	0	0	0	0	0	0
Projected Expenditures ($)	0	$10,123		$10,418		$10,713		$11,007	
Projected Water Savings(AFY)	-	2.37	0.79	2.36	0.79	2.35	0.78	2.34	0.78

7.0 Completed UWMP Checklist

This Plan meets all requirements of the Water Code as described in the Department of Water Resources (DWR) "Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan".

TABLE 39 URBAN WATER MANAGEMENT PLAN CHECKLIST

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		
16	Describe the groundwater basin.	10631(b)(2)		
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING [b]				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		
DEMAND MANAGEMENT MEASURES				
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

8.0 References

City of Greenfield 2010 Annual Water Quality Report

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Monterey County Water Resources Agency (MCWRA) Groundwater Summary Reports, 1995 – 2009.

California's Groundwater Bulletin 118, Central Coast Hydrologic Region, Salinas Valley Groundwater Basin, February 27, 2004.

State of California, Department of Water Resources, Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan, March 2011.

Monterey County Water Resources Agency (MCWRA) Website: http://www.mcwra.co.monterey.ca.us/

City of Greenfield Water Rate Study, prepared by NBS – December 2011

City of Greenfield Wastewater Rate Study, prepared by NBS – December 2011

Appendix A: 60-day Notice Letters

Appendix B: 2010 UWMP Adoption Resolution

Appendix C: Emergency Action Plans

Power Outage		
Summary:	This Action Plan applies to events that result in power outages. Note that thisAction Plan may need to be implemented in conjunction with other Action Plans(for example, severe weather) as necessary.Consider agreement with the power company to determine the priority of drinkingwater and wastewater systems for recovery prior to the emergency.	
Initiation and Notification:	Initiate this upon a loss of offsite power Notify: • Water Utility Emergency Response Manager • [Alternate WUERM] Others as appropriate, examples include: • Fuel supplier (back up generator) • Critical Care Customers • Large Water Users	Notify the [WUERM] by whatever means of communication may be available. Notification phone numbers can be obtained from the Organization
Equipment Identified:	Equipment Location Mobile battery-powered radios Mobile/cellular phones Flashlights Spare batteries Accessory requirements (cables for generators, transformers, load banks, bus bars, distribution panels, feeder panels, fuses, outlets, load centers, etc) Emergency kits	Radios should have access to a frequency compatible with the local fire dept, sheriff, public health officials, other government departments, utilities, services, or consultants. Cell phones may not be available during power outages.
Specific Activities:		
I. Assess the Problem	1. Call local hydro-electric supply company – request information on the estimated down time. 2. IF backup generation is available, then	Consider agreements with fuel supply company to supply fuel automatically upon a power loss if the capability to store fuel on site is not practical. A fuel

	assess the ability to supply fuel for extended periods. 3. Assess ability for HVAC or alternate to provide proper temperatures for SCADA, computer, and control systems. 4. Estimate potable water requirements under the emergency condition and determine if the utility can still meet requirements. 5. IF telephone is also down, then SCADA communications may be blocked. 6. Loss of power could affect utility access gates, CCTV, intrusion alarms and other remote monitoring abilities. Loss of power may be a diversionary tactic for other terrorist activity. Be alert.	tank with capacity for at least 24 hours of run time is advisable. If on-staff personnel are not experienced with power-generation equipment, it is necessary to arrange for professional assistance to install and operate the mobile units. Evaluate back-up power with controllers that sense problems with purchased power and come up automatically. Complete assessment as quickly as possible.
II. Isolate and Fix the Problem	7. Turn off unnecessary electrical equipment. 8. Start back up generators as necessary for key components: Note: Uninterruptible Power Supply (UPS) for SCADA and computers, battery back-up for Remote Terminal Unit (RTU) may only supply power for a few hours. 9. Increase disinfectant residual as a precaution to potential contamination. 10. IF not able to meet community requirements for water then arrange for water to be supplied by another source. Alternate Water Sources. 11. Notify priority customers 12. Notify users of interruption of service if backup pump(s) is/are not capable of maintaining supply. 13. Issue “Boil Water”, “Do not Drink”, or	This can prevent injuries and damage from unexpected equipment startups, power surges to the equipment and possible fires. If power goes out, an Uninterruptible Power Supply (UPS) provides battery power at a constant rate for several minutes, allowing you to safely turn off equipment with minimal risk or loss. If you permanently connect a backup electrical generator, the connection may have to meet certain technical standards required by law. Some states also require you to notify your electric utility. If you do not, utility personnel working nearby could be seriously injured. A temporary portable generator should not be connected to building wiring unless the building meets the same technical standards legally required

	"Do not Use" orders and Press Releases as appropriate. See Section VIII.A.1 of ERP for Press Release Forms. 14. Initiate back up plan for retrieval of current information from outside sources. 15. Consider initiating back-up portable pumping and generating capability to serve areas with limited storage, critical wastewater collection and treatment operations. 16. Facilities with freezing temperatures should turn off and drain the following lines in the event of a long term power loss: a. Fire sprinkler system b. Standpipes c. Potable Water Lines d. Toilets	for a permanent generator. Most buildings are not so equipped. As an alternative, use properly rated extension cords to connect electrical loads directly to the generator receptacles. This is an analysis of all available sources of water, not just those used under conditions of normal operation. These sources might include both new intakes or wells, public or private ponds, reservoirs, swimming pools, interconnections with other water utilities, water stored within building water systems, water provided in bottles or tank trucks from outside sources of potable water, local dairies or bottling plants, etc. Since computers may be down, access to Water ISAC, police, government, etc. could be compromised.
III. Monitoring	17. If damage to equipment occurs, then contact vendor/mutual aid companies to replace/repair damaged equipment. 18. Monitor the status of the backup power supply and regularly test whether battery levels are adequate and the backup generators are functional.	Ask your vendors about specific limitations of your equipment. Find out how long it would take to repair or replace damaged equipment.
IV. Recovery and Return to Safety	19. Conduct disinfection, flushing, and bacteriological sampling after repairs of equipment lost. 20. IF power outage occurs during freezing conditions THEN allow electronic equipment to reach ambient temperatures before energizing to prevent condensate from forming on circuitry. 21. Fire and potable water piping should be	

	checked for leaks from freeze damage after the heat has been restored to the facility and water turned back on. 22. Notify public/customers when it is safe to use the drinking water again.	
V. Report of Findings	23. All the components of the incident should be correlated and established in writing. This would include how the response was managed and suggestions to improve the facility / community response in the future. The report should incorporate all relevant data from the incident and suggested changes in the emergency response plans and procedures. 24. Suggestions from the report should be submitted to the governing board/individuals for evaluation and actions to be taken.	To learn from the incident and reduce the likelihood of future such events, a Report of Findings should be provided to the decision makers for the Utility so consideration can be given for changes in facility structure, security, procedures or personnel.

Natural Event (Flood)		
Summary:	This Action Plan applies to flooding events. In general, these events occur with reasonable lead times, and it is possible to take proactive measures, as outlined below. Response and recovery can be time consuming during flood events, as they can involve loss of electrical power supply, damage of structures and equipment, disruptions of service, and injuries to utility personnel.	
Initiation and Notification:	This AP should be initiated upon official notification of either a flood "watch" (a flood is possible in your area), or a flood "warning" (flooding is already occurring or will occur soon in your area). Such information will almost certainly be issued in the form of forecasts from the National Weather Service (NWS) and other governmental agencies. Also initiate if actual flooding is discovered.	Links to specific RFCs can be found at the following website: http://www.nws.noaa.gov/oh/hic/rfc.html The NWS maintains 13 regional River Forecast Centers (RFC) that are responsible for issuing flood forecasts synthesized from hydro-meteorological data. These centers offer current river conditions and observations, as well as forecast and guidance for both major river and flash floods,

	Notify • [WUERM] • [Alternate WUERM] The [WUERM] will make the decision to contact local response authorities to request possible assistance.	hydrographs for gauging stations, and flood outlook potentials. Be aware that floods often occur without local precipitation as a result of precipitation upstream. Flash flood guidance values can also typically be obtained via your local RFC. These values show data suggesting the amount of rain necessary over 1-, 3-, and 6-hour periods that could cause flash floods. While major floods can take several hours to days to develop, flash floods can take only a few minutes to a few hours to develop. Notification phone numbers can be obtained from the Organization Contact List in the Appendices as well as from Section XX of the ERP.
Equipment Identified:	Equipment Location Contact the Director of Public Works	This equipment is available to assist in the execution of this AP.
Specific Activities:		
I. Assess the Problem	If a Flood Watch or Warning is received: 1. Contact local representative of NWS for additional information on exact location and probable extent (stage) of flooding, relative to utility facilities. 2. Use site maps or other available information to assess location of all	Flood damage is proportional to the to the volume and the velocity of the water. Floods are extremely dangerous because they destroy through inundation and soaking as well as the incredible force of moving water. High volumes of water can move heavy objects and undermine roads and bridges. Flooding can also facilitate other hazards such as

	facilities for location in flood plain. 3. Prioritize pre-flooding activities on basis of flooding potential (in part, based on location). 4. If flooding has already occurred: • Conduct site assessment from nearest safe location. • Based on peak flood stage, predict and build inventory of equipment likely to be most affected. • List equipment needed to restore water service when flood waters recede.	landslides, or cause other hazards such as material hazard events
II. Isolate and Fix the Problem	The following steps should be taken in preparation for the event: 1. Activate Emergency Operations Center (EOC). 2. Assemble essential personnel and designate duties, such as: • Elevate in-place or remove water-sensitive equipment within structures to prevent flood damage. • Anchor fuel tanks. • Elevate electrical system components. • Take appropriate flood-proofing steps (sandbags or other). • Install sewer backflow valves. • Flood-proof or elevate heating, cooling, and ventilating equipment. • Assemble and stage mobile stand-by generators and auxiliary water pumps. 3. Notify neighboring utilities or other sources of emergency response	Steps in advance of flooding obviously will be different than steps in reaction to flooding. Both may be needed for any one flooding event. Flood water may have to be pumped out of facilities before utility equipment can be restored. Decision to shutdown must balance protection of utility equipment and maintenance of fire flows.

	support if manpower or equipment will be needed. 4. The [IO] is to notify customers, media, and state and local authorities that service may be disrupted and/or that demand reductions may be necessary. 5. Pre-test and/or initiate emergency communications plan 6. Consider shut-down if flooding appears imminent.	
III. Monitoring	Observe the following recommended practices during the flood event: • Take pictures of the damage, both of buildings and their contents, for insurance claims. • Instruct Utility personnel to avoid floodwaters whenever possible. • If a vehicle stalls in rapidly rising waters, abandon it immediately and climb to higher ground. Vehicles can be swept away in two feet of water. • Stay out of any building if floodwaters remain around the building. • Avoid smoking inside buildings. Smoking in confined areas can cause fires. • Wear sturdy shoes. The most common injury following a disaster is cut feet. • Use battery-powered lanterns or flashlights when examining buildings. Battery-powered lighting is the safest and easiest, preventing fire hazard for the user, occupants, and building. • Look for fire hazards. There may be broken or leaking gas lines, flooded electrical circuits, or submerged	If it is moving swiftly, even water six inches deep can knock an individual off their feet. Many people are swept away wading through floodwaters, resulting in injury or death. Floodwaters may still be rising. Staff may not be able to see on the surface how fast floodwater is moving or see holes and submerged debris. Floodwaters often undermine foundations, causing sinking, floors can crack or break and buildings can collapse. Buildings may have hidden damage that makes them unsafe such as gas leaks or electric hazards.

	furnaces or electrical appliances. Flammable or explosive materials may travel from upstream. Fire is the most frequent hazard following floods. • The [WUERM] or [IO] is to communicate with customers and the Local Emergency Planning Committee (LEPC) as to current conditions.	
IV. Recovery And Return to Safety	Once floodwaters recede, the following may be of relevance: • Check insurance policy for procedures to recover losses, including the national Flood Insurance Program. • Inspect foundations for cracks or other damage. • Check power lines for damages • Arrange for alternate source of electrical power or fuel for diesel generators, sufficient for period of outage following flood. See Power Outage. • Throw away all food that has come into contact with floodwaters. • Inspect, clean, rebuild, replace all affected equipment as necessary • Contact state and local authorities to determine if there are any restrictions on disposal of materials and debris removed from the site or if a temporary discharge permit (NPDES or other) is needed for the water pumped from tanks and other flooded structures.	More information can be found here: http://www.fema.gov/nfip Cracks and damage to a foundation can render a building uninhabitable. See Power Outage Contaminated floodwater contains bacteria and germs. Eating foods exposed to flood waters can make personnel very sick. In the longer-term, mitigation against loss of life and property caused by flood events is principally accomplished before the events, regulation. This involves strategies to modify flooding and to modify infrastructure to reduce likelihood of damage. Guidelines to a variety of flood-proofing and elevation methods are available from FEMA and NOAA.
V. Report of Findings	Assemble relevant personnel to review effectiveness of action plan and reinforce lessons learned.	

Natural Event (Winter Storm)		
Summary:	This Action Plan applies to winter storm events. In general, these events occur with reasonable lead times, and it is possible to take proactive measures, as outlined below. Response and recovery can be time consuming during such events, and they can involve loss of electrical power supply, damage of structures and equipment, disruptions of service, and injuries to utility personnel.	
Initiation and Notification:	When hazardous winter weather conditions are expected to affect the region, the National Weather Service (NWS) issues public advisories. This AP should be initiated upon official notification of a "winter storm watch" or more elevated status. In order of increasing severity, the standard terminology is as follows: Winter Storm Outlook: Issued prior to a Winter Storm Watch. The Outlook is given when forecasters believe winter storm conditions are possible and are usually issued 3 to 5 days in advance of a winter storm. Winter Weather Advisory: Issued for accumulations of snow, freezing rain, freezing drizzle, and sleet which will cause significant inconveniences and, if caution is not exercised, could lead to life-threatening situations. Winter Storm Watch: Alerts the public to the possibility of a blizzard, heavy snow, heavy freezing rain, or heavy sleet. Winter Storm Watches are usually issued 12 to 48 hours before the beginning of a Winter Storm. Winter Storm Warning: Issued when hazardous winter weather in the form of heavy snow, heavy freezing rain, or heavy sleet is imminent or occurring. Winter Storm Warnings are usually issued 12 to 24 hours before the event is expected to begin. Blizzard Warning: Issued for sustained or gusty winds of 35 mph or more, and falling or blowing snow creating	See the NWS website for current warnings here: NWS Notification phone numbers can be obtained from the Organization

	visibilities at or below ¼ mile; these conditions should persist for at least three hours. It is expected that the local the Local Emergency Planning Committee (LEPC) will carefully and continually monitor meteorological conditions and forecasts. During such events, the Local Emergency Planning Committee (LEPC) shall be in constant contact with the National Weather Service (NWS) and disseminate information to agencies via conference call, e-mail and broadcast fax.	
Equipment Identified:	Equipment Location Contact the Director of Public Works	This equipment is available to assist in the execution of this AP.
Specific Activities:		
I. Assess the Problem	Winter storms, accompanied by strong winds and blizzard conditions, have resulted in localized power and phone outages; closures of streets, highways, schools, businesses, and nonessential government operations. People have been isolated from essential services in their homes and vehicles. A winter storm may escalate into a catastrophic event paralyzing municipalities, and rural areas for several days. Life threatening situations may occur in which emergency response agencies cannot perform their duties due to extreme weather conditions. Individual jurisdictions may be over-whelmed and need mutual aid assistance.	
II. Isolate and	Snow removal capabilities will vary widely, general	

Fix the Problem	procedures are as follows: Before the storm: 1. Activate Emergency Operations Center (EOC). 2. Monitor track of storm. 3. Release nonessential personnel, as warranted. 4. Assemble essential personnel and designate duties. 5. Typical duties at this stage may include: • Fill gravity storage tanks. • Test auxiliary power sources. • Fill fuel tanks. • Secure windows and doors. • Mobilize snow removal equipment, as warranted. • Man remote stations essential to operations. • Stockpile chemicals, food, etc. 6. Discuss needs with electric company. 7. Test back-up communications system. 8. Review mutual aid agreements and verify connections to/from neighboring water systems. Review specific power outage contingency action plan. During the storm: 1. Notify customers, media, and state and local authorities if service is disrupted or if significant demand management is necessary. 2. Monitor reservoirs. 3. Monitor changes in water quality. If a water quality emergency should develop, follow the appropriate procedure. 4. Open connections with neighboring water systems if necessary. 5. Provide backup power to facilities utilizing mobile generators, as appropriate.	
III. Monitoring	In order to monitor the infrastructure status and residents' health during a winter weather event, it is expected that the Utility will assist the Local Emergency Planning Committee (LEPC) in gathering the following types of information: • Electrical load • EMS cold-related responses / total responses • Cold weather-related water main breaks	

• Available sheltering centers
• Status of salt and sand stockpiles
• Available snow removal assets
• Cold-related incidents / concerns

During winter weather emergencies, heavy snowfall, coupled with icy roads or ice accumulations on aboveground electrical transmission lines, can result in vehicular accidents and transmission line failure. Power outages during winter weather events can pose serious problems, particularly among those communities where life-sustaining equipment (LSE) is a necessity.

Personnel should avoid traveling by vehicle, but if necessary, it is important to communicate destinations, routes, and expected arrival times. If vehicles get stuck along the way, help can be sent along the predetermined route. If personnel do get stuck:

• Staff should stay with their car and not try to walk to safety.
• Tie a colored cloth to the antenna for rescuers to see.
• Start the car and use the heater for about 10 minutes every hour. Keep the exhaust pipe clear so fumes won't back up in the car.
• Leave the overhead light on when the engine is running to be seen.

Keep arms and legs moving to keep blood circulating and to stay warm and keep one window away from the blowing wind slightly open to let in air.

During heavy storms, search and rescue operations, movement of emergency response agencies to assigned duties and restoration of essential services are likely to become the primary focus of the EOC.

Priorities of response forces, prioritization of the use of snow removal equipment and allocation of all critical

	resources and response personnel will be the responsibility of the EOC.	
IV. Recovery And Return to Safety	It is recommended that staff observe the following safety tips in recovery from winter storm events: • After the storm, if personnel are required to shovel snow, be extremely careful. It is physically strenuous work, requiring frequent breaks. Avoid overexertion. Heart attacks from shoveling heavy snow are a leading cause of deaths during winter. • Walk carefully on snowy, icy, sidewalks.	
V. Report of Findings	Assemble relevant personnel to review effectiveness of action plan and reinforce lessons learned.	

Natural Event (Earthquake)		
Summary:	This Action Plan applies to earthquake events. In general, these events occur without any lead times, making it impossible to take proactive measures. Response and recovery can be time consuming during such events, and they can involve loss of electrical power supply, damage of structures and equipment, disruptions of service, and injuries to utility personnel.	
Initiation and Notification:	An earthquake usually occurs without any type of warning. Due to the suddenness, all personnel should attempt to find immediate shelter. This may include: • Standing in a doorway and bracing your hands and feet against each side. • Getting under a desk or heavy table. • Standing flat against an interior wall. • Do not seek cover under laboratory tables or benches as chemicals could spill and harm personnel. After an earthquake has stopped, initiate this earthquake AP 8D.	Notification phone numbers can be obtained from the Organization Contact List
Equipment Identified:	Equipment Location Contact the Director of Public Works	
Specific Activities:		

I. Assess the Problem	In general, the [WUERM] will organize an assessment team to undertake the following activities: • Inspect all structures for obvious cracks and damage. • Assess condition of all electrical power feeds and switchgear. • If SCADA is working, immediately review system for all types of malfunctions, including telemetry, pressure in the distribution system, and operation of pumps and other equipment. • If buildings have any sign of damage, such as cracked walls, broken windows, downed power lines, do not enter, but wait for trained personnel. • If buildings appear safe, cautiously inspect condition of interiors for damaged equipment, leaks, chemical spills, etc. • Communicate all findings via radio to Emergency Operations Center (EOC) or [WUERM], as appropriate. • Activate personnel accountability network to check for injury of staff. Earthquakes can cause significant power outages because of the impact on outside generation and transmission lines. After a major earthquake, power might be interrupted for an extended period of time over the entire operations area. In this instance, power restoration will most probably be slow and, depending upon the infrastructure damage, localized. Some isolated areas could take considerably longer for power restoration than others.	Be prepared for aftershocks. Although smaller than the main shock, aftershocks cause additional damage and may bring weakened structures down. Aftershocks can occur in the first hours, days, weeks, or even months after the quake. Follow the same procedures as for earthquakes. See specific power loss procedures
II. Isolate and Fix the Problem	General earthquake procedures during an earthquake are as follows: 1. Seek shelter under a deck, table, doorway, or inside wall. 2. Once the shaking has stopped, gather valuables and quickly make your way outside. (DO NOT USE ELEVATORS.)	

	3. Avoid electric wires, poles and equipment, once outside. 4. Prepare for aftershocks.	
III. Monitoring	At all times, personnel should observe the following general steps: • Stay calm and await instructions from the designated official. • Keep away from overturned fixtures, windows, filing cabinets, and electrical power. • Provide assistance and/or call for medical help for injured employees as needed. • If major structural damage has occurred, order a complete evacuation. The building should be inspected by trained personnel for damage before reentry. • Protect from further danger by putting on long pants, a long-sleeved shirt, sturdy shoes, and work gloves. • Look for and extinguish small fires. Eliminate fire hazards. • Monitor the radio for instructions. • Expect aftershocks. • Use the telephone only to report life-threatening emergencies.	
IV. Recovery And Return to Safety	General earthquake procedures after an earthquake are as follows: 1. Activate Emergency Operations Center (EOC). 2. Contact emergency assistance (local police, local fire department, rescue squad, etc) as necessary to respond to injuries of staff. 3. The [IO] is to notify customers, media, and state and local authorities if service is disrupted or if significant demand management is necessary. 4. Inspect facilities for structural damage, including: buildings, storage tanks, pipelines, and process equipment. Consider the use of an outside engineering consultant. 5. Prioritize and repair water main leaks. 6. Contact neighboring purveyors for mutual aid arrangements, and open connections as needed. 7. Respond to side effects (loss of power, fire chemical spills,	

	etc.)	
V. Report of Findings	Assemble relevant personnel to review effectiveness of action plan and reinforce lessons learned.	

Appendix D: Municipal Code Chapter 13.09: Mandatory Water Conservation Regulations & Water Shortage Contingency Plan & Resolution to Declare a Water Shortage Emergency

Appendix E: Water Rate Study

Appendix F: Waste Water Rate Study

Appendix G: City Data

Appendix H: Public Comments

On April 23, 2013, the Greenfield City Council held a second public hearing on the Final Draft 2010 Urban Water Management Plan. The comments and/or questions raised during the Public Comment / City Council meeting are summarized below.