

# CITY of FORTUNA URBAN WATER MANAGEMENT PLAN

Prepared for:  
City of Fortuna  
180 Dinsmore Drive  
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## **INTRODUCTION**

This Urban Water Management Plan (UWMP) has been prepared in compliance with requirements of the California Department of Water Resources (DWR) pursuant to the Urban Water Management Act (UWMP Act) and the Water Conservation Bill of 2009.

The UWMP Act (California Water Code §10610 et seq.) requires urban water suppliers to report, describe, and evaluate the following:

- Water deliveries and uses;
- Water supply sources;
- Efficient water uses; and
- Demand Management Measures (DMMs), including implementation strategy and schedule.

In addition, the Water Conservation Bill of 2009 requires urban water suppliers to report in their UWMPs base daily per capita water use (baseline), urban water use target, interim urban water use target, and compliance daily per capita water use. The UWMP Act directs water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future demands (CWC 10612 (b)). Urban water suppliers are required to assess current demands and supplies over a 20-year planning horizon and consider various drought scenarios. The UWMP Act also requires water shortage contingency planning and drought response actions to be included in the UWMP.

## SECTION 1 PLAN PREPARATION

The intent of this section is to describe how the UWMP was prepared, coordinated with other agencies and the public, and adopted. This plan was prepared with the assistance of Freshwater Environmental Services.

### 1.1 Coordination

**Requirement** - 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 (10620(d)(2)).

The City of Fortuna does not receive or supply water to any other agencies or municipalities. The City of Fortuna does not share a common source of water and there are no local water management agencies. The neighboring municipalities of Palmer Creek Community Service District, the City of Rio Dell, the Town of Scotia and Humboldt County were notified that the City of Fortuna is updating their UWMP (Table 1). A copy of the notification letter forwarded to these communities is contained in Appendix A.

**Requirement** - The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan (10635(b)).

The City of Fortuna does not supply water to any other city or county.

**Requirement** - 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 (10642).

The City of Fortuna has encouraged public participation in the process of developing this 2010 UWMP. Public outreach and plan coordination is documented in Table 1.

**Requirement:** - 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 within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area (10642).

For the City of Fortuna's 2010 UWMP, a public hearing was held during the June 20, 2011 City of Fortuna Regular City Council meeting. Two weeks prior to the hearing, notice of the time and place of the public hearing was published in the local newspaper and posted on the City's web site (Appendix B).

**Requirement:** - After the hearing, the plan shall be adopted as prepared or as modified after the hearing (10642).

Following the public hearing the plan was modified and adopted as described below.

## 1.2 Plan Adoption, Submittal, and Implementation

**Requirement:** - The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640) (10621(c)).

The City of Fortuna's 2010 UWMP, was adopted by the Fortuna City Council on June 20, 2011 by Resolution 2011-25, and will be submitted to the DWR by July 30, 2011.

**Requirement:** - An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan (10643).

The City of Fortuna UWMP is being implemented in accordance to the schedule contained in the plan.

## SECTION 2 SYSTEM DESCRIPTION

The intent of this section of the UWMP is to describe the physical setting of the water distribution system and the population of the service area.

### 2.1 Service Area Physical Description

**Requirement:** - Describe the service area of the supplier (10631(a)).

The City of Fortuna is situated in Humboldt County, and is approximately 270 miles north of San Francisco. The City lies within the Eel River Valley, and covers approximately five square miles (Figure 1 and 2). The City is bounded by the flood plain of the Eel River to the west, by the bluffs adjacent to the Van Duzen River to the south, and by the foothills of the Coastal Range to the east and north.

With the incorporation of the City of Fortuna in 1906, water service was established for all residential, commercial, industrial, and agricultural customers, as well as for fire protection. The City of Fortuna also serves an unincorporated area south of Drake Hill Road, which is the southern boundary of the city limits. Campton Heights was supplied by a private water system including a groundwater well and storage tank. This system was purchased by the City of Fortuna. Upon purchase, the Campton Heights system was modified and is now supplied water from the City of Fortuna water system. The City of Fortuna operates under the provisions of the Charter City Law of the State of California. Current services provided by the City of Fortuna are sewer, water, street lighting, street maintenance, storm drainage, law enforcement, parks and recreation, community development, engineering, building inspection and flood plain management.

The City of Fortuna is representative of a growing urban city surrounded by a rural community. The City serves as a major regional shopping center for much of central and southern Humboldt County due to its location.

Water supplied to City of Fortuna customers consists of groundwater extracted from four shallow wells owned by the City. These wells, which are up to 112 feet deep, are all located at the southwest corner of the city, and produce excellent quality water. These wells receive chlorination before distribution to the reservoir storage and distribution system.

Drinking water is pumped to five reservoirs, Campton Heights, Hillside, Holman, Stewart, and Vancil. As indicated on the hydraulic map of the water system (Figure 3), the distribution system includes six water booster pump stations and five reservoirs for a total storage capacity of approximately 7,280,000 gallons.

There are eight pressure zones, which distribute water throughout the City (Figure 3). The water reservoirs operate five different pressure zones using gravity flow. The other three pressure zones are supplied hydro-pneumatically by pump stations, and are subject to shortages in the event of power outages. The City currently owns two generators, of which the largest is 35 kW, to protect against water shortages in such an event.

The City of Fortuna supplies water to 4,303 active connections (2010). Approximately 358 connections are commercial, two are industrial, and one agricultural. Fire protection is achieved through 279 Fire Hydrants.

In 2010, a total of 440 million gallons of water were pumped from the wells to supply water for the City of Fortuna.

**Requirement:** - (Describe the service area) climate (10631(a)).

The climate of Fortuna is typical of coastal Northern California, characterized by moderate temperatures, frequent fog and moderate to heavy precipitation. The average annual rainfall is 48 inches, and occurs mainly between October and April. Additional climate information for the Fortuna area is provided in the table below.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
<b>Average Max. Temperature (F)</b>	55	57	59	60	63.2	66	69	70	71	67	61	56	62.9
<b>Average Min. Temperature (F)</b>	40	42	42	44	47.7	51	53	53	51	48	44	41	46.4
<b>Average Total Precipitation (in.)</b>	8.8	7.5	6.5	3.5	1.68	0.6	0.1	0.2	0.6	3	6.4	9.2	48.09
<b>Average Total Snow Fall (in.)</b>	0.1	0.1	0	0	0	0	0	0	0	0	0	0.1	0.3
<b>Average Snow Depth (in.)</b>	0	0	0	0	0	0	0	0	0	0	0	0	0

The data in the above table is from the California Irrigation Management Information System (CIMIS) website <http://www.cimis.water.ca.gov>. Data shown is for the Scotia Station (048045) January 1926 - December, 2010.

## 2.2 Service Area Population

**Requirement:** - (Describe the service area) current and projected population. 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. (10631(a)).

The drinking water distribution service area is +/- 95% of the jurisdictional boundary of the City of Fortuna. The historical population estimates for the City of Fortuna were acquired from the US Census Bureau.

**Requirement:** - (population projections) shall be in five-year increments to 20 years or as far as data is available (10631(a)).

Population growth for the City of Fortuna averaged 1.3% per year over the period 2000-2010 (California Department of Finance). The average population growth was 1.66 per year over the period 1989-1999. Population projections for 2015, 2020, 2025, and 2030 were calculated using an estimated annual growth rate of 1.3% (average population growth over the past 10 years) as indicated in Table 2.

**Requirement:** - Describe other demographic factors affecting the supplier's water management planning (10631(a)).

As contained in the 2010 Fortuna General Plan, Fortuna is at a crossroads in terms of its built environment and economic base. Over the past 100 years, Fortuna has relied on the logging industry as the cornerstone of its economic base. Over the last decade, Fortuna and the rest of the North Coast region have seen several mill closures including two mills within the Planning Area.

Significant changes in Fortuna’s demographics over the last 15 years (1995 to 2010) will significantly affect the City’s ability to adequately provide services. Service-dependent populations, including school-aged children and seniors, have grown. Based on 2000 Census data, Fortuna has both a larger proportion of residents under age 18 than the county overall (26 percent compared to 23.2 percent) and a larger proportion of residents over age 64 (17.3 percent compared to 12.5 percent). Since 1995, there has been an influx of large households (five or more occupants) and retired seniors. In addition, the number of Spanish-speaking residents has rapidly increased. As of 2005, approximately 25 percent of the Fortuna school-age population speaks English as a second language.

During the 2006 General Plan Update community workshops, attendees identified housing affordability and the need for a variety of housing types (e.g., senior housing) as key issues facing the city. Given rising housing prices statewide and the aforementioned demographic changes, the City was forced to reexamine whether it needs to provide a greater range of housing opportunities and choices. According to the 2000 Census, approximately 90 percent of the city’s housing stock consists of single-family homes. The General Plan now strives to meet housing needs by encouraging housing types that meet community needs, such as senior housing, residential mixed use (found in the Downtown), townhouses, apartments, and second dwelling units.

Over the past several decades, Fortuna has seen a steady decline in one of its biggest employment sectors – the timber industry. Triggered by the closing of two local mills since 2003, the City has examined how it can redefine itself economically. Fortuna has struggled to attract higher paying employers. For instance, in 2006, Fortuna fell behind the rest of the county in terms of the share of its workforce employed in managerial, professional, and specialty occupations. As of 2006, Fortuna’s workforce lacked the skills and educational background sought by many industries. Based on 2000 census data, Fortuna lagged behind the overall county in terms of its share of residents with a bachelor’s, graduate, or professional degree. According to the Council on Competitiveness (2005), when asked to identify what would disqualify a region for new corporate investment, key factors listed included a shortfall of talent, poor communications infrastructure, a poorly educated workforce, and low quality of life.

The customer base for the City of Fortuna water distribution in 2010 is described in the table below:

Type of Service Connection	Number of Service Connections
Single family residential	3,734
Multi-family residential	183

Commercial	358
Industrial	2
Landscape irrigation	25
Agricultural irrigation	1
Total Connections	4,303

According to the 2010 census data the annual median household income for the City of Fortuna was \$41,645. The median household income for the State of California was \$62,432. Eighty percent of the annual median household income is \$49,946. The annual median household income of Fortuna is less than 80% of the California annual median household and meets the criteria of a disadvantaged community.

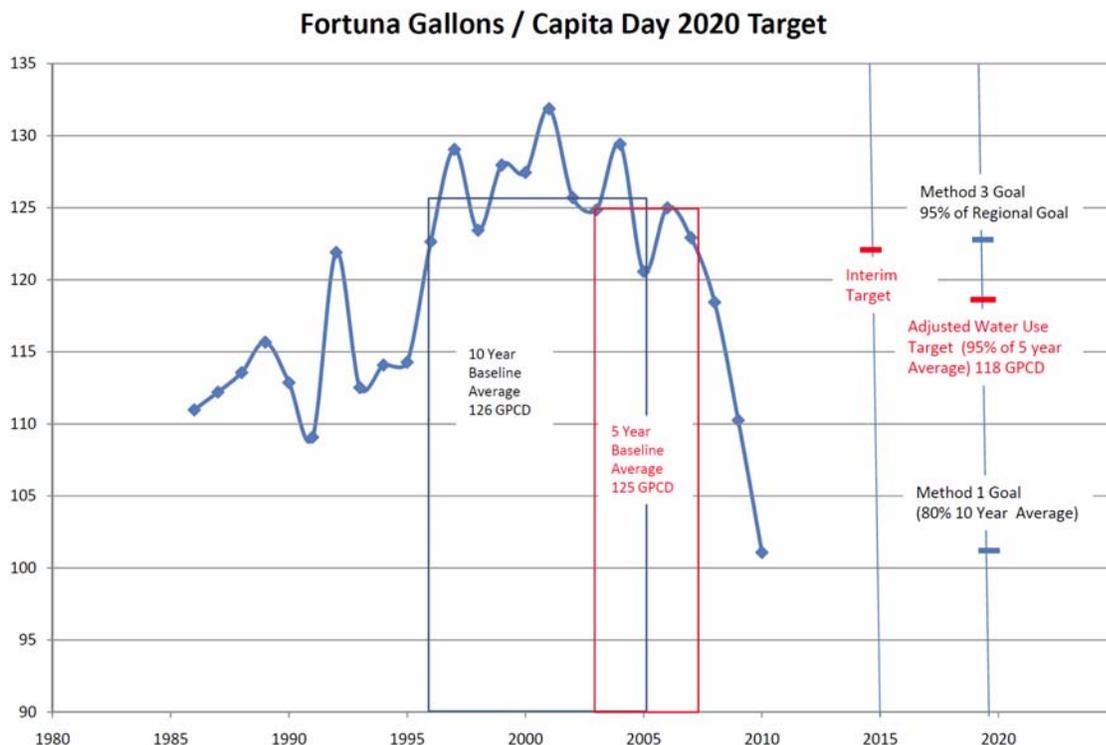
## SECTION 3 SYSTEM DEMANDS

### 3.1 Baselines and Targets

**Requirement:** - An urban retail water supplier shall include in its urban water management plan . . . due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data (10608.20(e)).

The Methodology contained in Calculating Baseline and Compliance Urban Per Capita Water Use, (California Department of Water Resources, 2011) was used to determine the target and baseline values for the City of Fortuna (Tables 13-15). The spreadsheet used for determination of baseline and targets is included in Appendix C The City of Fortuna calculated individual baselines and targets. In 2008, the City of Fortuna did not have at least 10% of its 2008 measured retail water demand met through recycled water and therefore used a 10-year baseline. Methodology #1 was used to determine gross water use and methodology # 2 was used to determine the services population area. The service area for the City of Fortuna water distribution is +/- 95% of the area covered by the Fortuna city limits therefore the population for the City of Fortuna was used as the service area population. The first base period (10-year continuous period) was selected from 1996 to 2005. The average gallons/capita day (GPCD) for the 10-year base period was 126 GPCD. Using Method # 3 (95% of the regional goal of 130) to calculate the 2020 GPCD goal for the City of Fortuna results in 123 GPCD.

The second baseline (5-year continuous period) was selected from 2003 to 2007. The average GPCD for the 5-year baseline was 125 GPCD. Since 95% of the 5-year baseline is 118 GPCD and is less than the 2020 GPCD goal using Method # 3 (123 GPCD) the adjusted 2020 GPCD goal is 118 GPCD. The interim target goal for 2015 is 122 GPCD.



### 3.2 Water Demand

**Requirement:** - Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), 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; (I) Agricultural (10631(e)(1) and (2)).

The required information is included in Tables 3 through 7. There is no anticipation that the City of Fortuna would sell water to any other agencies as indicated in Table 9. The City of Fortuna does not anticipate any other water uses as indicated in Table 10. Total water demand is summarized in Table 11.

**Requirement:** - The water use projections required by Section 10631 shall include projected water use for single-family and multi-family residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier (10631.1(a)).

According to the City of Fortuna General Plan Housing Element, 2010, it is estimated that in 2014 5.9% of the housing needs to be allocated to low income households and below. The 5.9% housing was used to project the estimated water uses over the planning period (Figure 8)

### 3.3 Water Demand Projections

**Requirement:** - Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c) (10631(k)).

The City of Fortuna does not anticipate being provided any water from any other agency as reflected in Table 12.

### 3.4 Water Use Reduction Plan

**Requirement:** - Urban wholesale water suppliers shall include in the urban water management plans . . . an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part (10608.36). Urban retail water suppliers are to prepare a plan for implementing the Water Conservation Bill of 2009 requirements and conduct a public meeting which includes consideration of economic impacts (CWC §10608.26).

The City of Fortuna has established a 2020 water consumption goal of 118 GPCD. The City established a five-year rate schedule for water service beginning in 2006 that resulted in commodity pricing with increasing rates over the five year period. The impact of the rate changes has been dramatic and resulted in a reduction of water consumption from 129 GPCD in 2004 to 101 GPCD in 2010 exceeding the 2020 water consumption goal. The City of Fortuna is committed to increase additional public and school education programs, introduce conservation pricing, and will propose an ordinance prohibiting water waste. These additional water conservation measures should result in additional reductions of GPCD by 2020.

## SECTION 4 SYSTEM SUPPLIES

This section describes the sources of water available to the City of Fortuna. It includes a description of each water source, source limitations (physical or political), water quality, and water exchange opportunities.

### 4.1 Water Sources

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

The City of Fortuna relies on groundwater, extracted from five city-owned groundwater wells, for their entire water supply (Figure 3). In the planning period there are no plans to acquire water from any wholesalers of other sources as indicated in Tables 16 and 17.

### 4.2 Groundwater

**Requirement:** - (Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . . (10631(b))?

The City of Fortuna directly obtains groundwater from five groundwater wells that it uses to supply the water needs of the City of Fortuna.

**Requirement:** - (Provide a) copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management (10631(b)(1)).

The City of Fortuna does not have a groundwater management plan or other specific authorization for groundwater management.

**Requirement:** - (Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater (10631(b)(2)).

The City of Fortuna acquires drinking water from five groundwater wells that they own and operate. Groundwater from all of the wells is being produced from the Eel River Valley Groundwater Basin (Figure 4). The geology of the Eel River Valley Groundwater Basin is shown in Figure 5. A geologic cross section of the Eel River Valley Groundwater Basin is shown in Figure 6. The general location of the City of Fortuna water wells is included in Figures 3-4).

The following section describing the Eel River Valley Groundwater Basin is from California's Groundwater Bulletin 118, 2003 update, (State of California, Department of Water Resources, 2003):

#### ***Basin Boundaries and Hydrology***

*The Eel River Valley Groundwater Basin is one of the principal groundwater basins in the Eureka area of Humboldt County. The area includes the lower 8 miles of the Van Duzen River Valley and the Eel River Valley. The basin is bordered on the north by the Little Salmon Fault, on the south by the Plio-Pleistocene Carlotta Formation, and to the east by the Wildcat series;*

however, the actual extents of the eastern boundary is uncertain (Strand, 1963) and (Clark 1990). The Wildcat series is a group of five formations ranging in age from Miocene to Pleistocene consisting of sandstone, marine siltstone, and claystone (Evenson, 1959). The Carlotta Formation forms the uppermost formation of the Wildcat series. Surficial deposits of the Carlotta Formation are observed north and south of the Van Duzen River Valley, located in the southeastern portion of the basin, and is an important water-bearing formation.

The basin includes the Eel River delta and channel gravels, floodplain clays and silts, and older terrace gravels of the Eel River and Van Duzen River. The basin also includes outcrops of the Hookton and Carlotta Formations in the northern and southern portions of the valley. Annual precipitation in the basin ranges from 41 to 55 inches, increasing to the southeast.

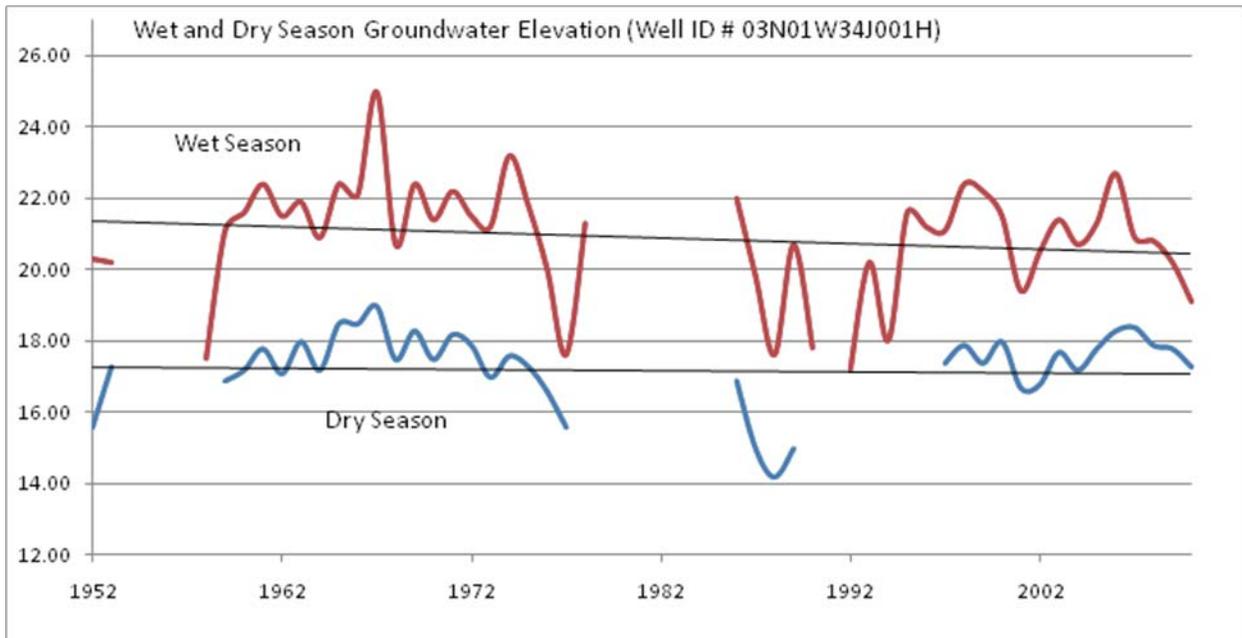
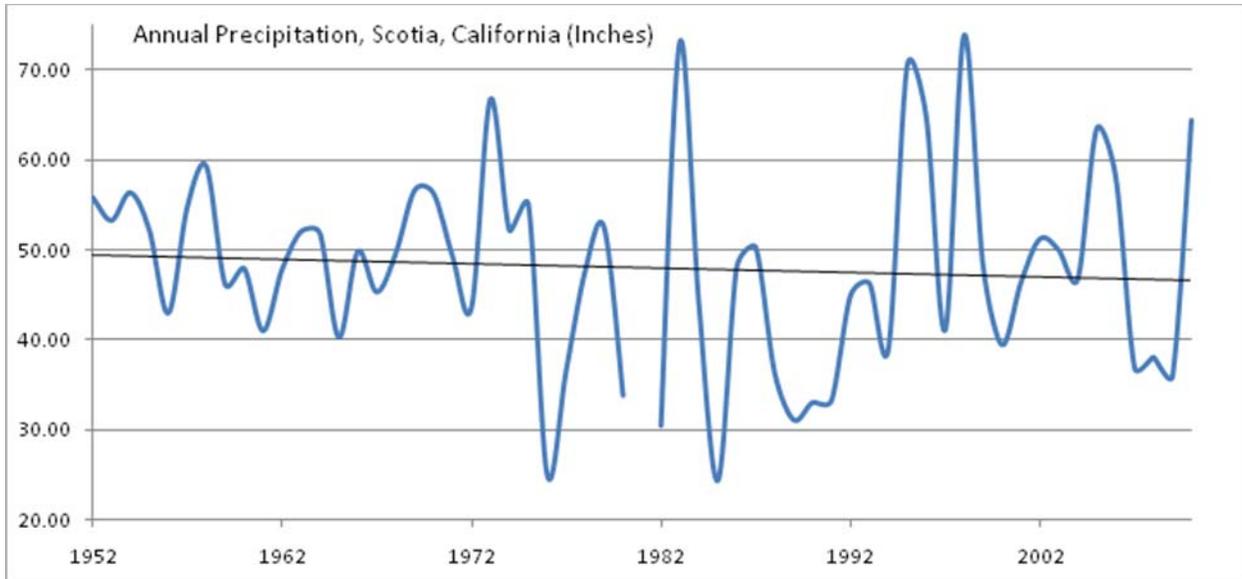
### **Hydrogeologic Information**

The aquifer system of the Eel River Valley Basin is primarily composed of alluvium underlain by the Hookton and Carlotta Formations. Upland areas to the northeast are comprised of the Hookton Formation underlain by the Carlotta Formation. The Carlotta Formation is underlain by the remainder of the Pliocene Wildcat series. The Little Salmon Fault forms a hydrologic barrier to the north.

### **Water-Bearing Formations**

Water-bearing formations include Quaternary river channel and floodplain deposits, the Carlotta Formation and, to a lesser extent, the Hookton Formation. The major aquifer in the basin is the alluvium that underlies the floodplain of the Eel River Valley (Evenson, 1959). The alluvial deposits underlying the Eel River delta consist of blue clay or sandy clay ranging in thickness from 1- to 75-feet. Between the Eel and Salt rivers, the alluvium consists of coarse sand and gravel from the surface to depths of 60 feet or more. Coarse gravel and sand containing minor amounts of silt and clay extend upstream along the Eel River to its confluence with the Van Duzen River. The Eel River Valley is underlain by poorly sorted sand and gravel, as much as 200 feet in thickness. Most of the groundwater used in this area is obtained from wells tapping these beds. (Evenson, 1959).

Wet season and dry season groundwater elevation data was collected by the DWR (<http://www.water.ca.gov/waterdatalibrary/groundwater/index.cfm>) from a well located in Fortuna (Well ID # 03N01W34J001H). Annual precipitation data provided by NOAA (<http://www.nws.noaa.gov/>) from the nearest location (Scotia, California) are plotted on the charts below. Linear trend lines were constructed for annual precipitation, the wet season groundwater elevation and the dry season groundwater elevations. All of the trend lines are gradually decreasing with time. Although groundwater elevations have decreased since 1952 so has the annual precipitation. Wet season groundwater elevations are decreasing at a greater rate than dry season elevations.



The following section describing the Eel River Valley Groundwater Basin is from California's Groundwater, Bulletin 118, 2003 update, (State of California, Department of Water Resources, 2003):

**Groundwater Storage Capacity.** Evenson (1959) estimates storage capacity for the basin to be 125,000 acre-feet (40,716 million gallons) based on a surface area of 19,400 acres and an average specific yield of 22 percent. The saturated thickness varied from 10- to 40-feet. DWR (1975) estimates the storage capacity for the basin to be 136,000 acre-feet (44,300 million gallons). Useable storage capacity is estimated to be 100,000 acre-feet (32,537 million gallons).

### **Groundwater Budget (Type B)**

*Estimates of groundwater extraction are based on a survey conducted by the California Department of Water Resources in 1996. The survey included land use and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 49,000 and 1,400 acre-feet respectively (15,961 and 456 million gallons). Deep percolation from applied water is estimated to be 9,500 acre-feet (3,094 million gallons).*

### **Groundwater Quality**

**Characterization.** *Groundwater in the basin is characterized as magnesium-calcium bicarbonate and magnesium-sodium bicarbonate type waters. Total dissolved solids (TDS) range from 110- to 340-milligrams per liter (mg/L), averaging 237 mg/L (DWR unpublished data).*

**Impairments.** *Impairments to groundwater include high iron concentrations and locally high TDS, manganese, magnesium, calcium, boron, nitrite, and phosphorus.*

**Requirement:** - (For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board (10631(b)(2)).

The City of Fortuna does not have adjudicated rights to pump groundwater.

**Requirement:** - (Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree (10631(b)(2)).

Since there are no adjudicated rights to the groundwater, there is no legal limit for the amount of groundwater that the City of Fortuna can pump.

**Requirement:** - For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current 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 (10631(b)(2)).

The Eel River Valley Groundwater Basin is not in critical or overdraft condition (DWR, 2003).

Efforts being undertaken to eliminate the long-term overdraft conditions include groundwater level monitoring, metering, groundwater pumping, and promotion of water conservation techniques through public and school education programs.

**Requirement:** - (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. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (10631(b)(3)).

The volume of groundwater pumped from 2005 through 2010 is included in Table 18. During 2005-2010 there were no limitations or challenges obtaining groundwater.

**Requirement:** - (Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and

analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (10631(b)(4)).

The volume of water projected to be pumped during the planning horizon of the UWMP is included in Table 19. There are no changes or expansion planned for the groundwater supply.

#### **4.3 Transfer Opportunities**

**Requirement:** - Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis (10631(d)).

Currently, and in the planning horizon, the City of Fortuna does not plan to exchange or transfer water on a short-term or long-term basis (Table 20).

#### **4.4 Desalinated Water Opportunities**

**Requirement:** - Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply (10631(i)).

Beyond it being cost prohibitive, there are no sources of ocean water or brackish groundwater in the area of Fortuna. Therefore, there are no opportunities for development of a desalinated water supply.

#### **4.5 Recycled Water Opportunities**

**Requirement:** - Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area (10633).

There are no additional facilities or agencies within the City of Fortuna's service area.

The wastewater effluent generated from the Fortuna wastewater facility does not meet the Title 22 land application standards. Wastewater effluent is "recycled" by reusing it in the wastewater treatment plant (60,000 gallons per day) and avoids the use of potable water in the wastewater treatment plant.

Recycled water could be used to irrigate city owned properties and parks but the quality of the wastewater effluent does not currently allow such uses.

The City recently approached the EPA regarding the possibility of utilizing recycled water in conjunction with an enforcement action that the EPA is processing in the Strongs Creek Plaza area. The EPA is requiring an extensive wetlands restoration plan in conjunction with this enforcement action, and the City proposed utilizing recycled water to enhance the wetlands restoration project. The EPA respectfully declined consideration of this possibility in conjunction with their enforcement action.

The City will continue to consider additional opportunities to recycle wastewater effluent in conjunction with a proposed capital improvement project to modify the City's summer discharge location and method. During the feasibility analysis task of this project, the City will examine the

regulatory requirements to meet Title 22 regulations for land application, and the cost feasibility of incorporating this alternative into the City's summer discharge regime.

The City is not aware of other potential sources of recycled water.

**Requirement:** - (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)).

The amount of wastewater collected and treated by the City of Fortuna and projected wastewater volume (estimated to increase by 1.3% a year) is included in Table 21.

**Requirement:** - (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)).

Currently there is no processed wastewater generated that meets the recycled water standard in Title 22 as indicated in Table 21 and 22. The limitation of the use of recycled water is that current treatment results in concentrations of coliform and turbidity which do not meet Title 22 standards.

**Requirement:** - (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)).

Approximately 60,000 gallons per day of treated wastewater effluent, although not meeting Title 22 Standards, is being used within the wastewater treatment plant - and thereby reducing the use of potable water. Wastewater effluent does not meet Title 22 standards and recycled water is not currently being used within the City of Fortuna's services area as indicated in Table 23.

**Requirement:** - (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)).

In the conjunction with the relocation of our summer discharge location the City of Fortuna is considering alternatives including irrigation of agricultural lands by either Type 1 or Type methods.

The feasibility of using recycled water for irrigation of City-owned parks is in the initial stages of discussion and is the only recycled water project being considered as indicated in Table 23.

**Requirement:** - (Describe) the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision (10633(e)).

Although the city is looking into the feasibility of using recycled water for irrigation of City-owned parks, there are no existing or planned recycled water projects as indicated in Table 23. The City of Fortuna did not complete a 2005 UWMP therefore projected values cannot be compared as indicated in Table 24.

**Requirement:** - (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)).

By discussing the use of recycling for irrigation of City owned parks it will educate and encourage the use of recycled water within its service area. At this time, no financial incentives are being implemented and none are planned within the planning period (Table 25).

**Requirement:** - (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 recycling 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)).

The primary obstacle for using and promoting the use of recycled water is that the wastewater effluent currently does not meet Title 22 Standards. The City is exploring the use of recycled wastewater onto City owned parks and will need to address the effluent quality and determine the feasibility and cost of installing a dual distribution system.

#### **4.6 Future Water Projects**

**Requirement:** - (Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, 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 the 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 (10631(h)).

The City of Fortuna is able to meet the total water projected use with the existing water source and does not have any future projects or programs planned other than the demand management programs described in Section 5. As indicated in Table 26 the City of Fortuna does not have any planned projects or programs to expand the water supply.

## SECTION 5 WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING

### 5.1 Water Supply Reliability

**Requirement:** - An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions (10620(f)).

**Requirement:** - 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)).

The City of Fortuna extracts groundwater from the Eel River Valley Groundwater Basin. According to the City of Fortuna's Program Environmental Impact Report dated July, 2010 the groundwater basin contains a volume of approximately 44,300 million gallons (MG) that is recharged by percolation at a rate of 32,5650 MG per year. Although the storage capacity is about 44,300 MG, the usable yield of this groundwater storage basin is estimated to be 13,000 MG to 19,500 MG annually. A little more than 3,257 MG of ground water is currently being pumped from the basin for agricultural purposes) leaving a potential of producing 9,743 MG to 16,243 MG per year (Table 16 and 29). California has no statewide water right permit process for regulating the use of percolating groundwater.

Potential issues that could result in reduction of the amount of water supply from the groundwater source (Eel River Valley Groundwater Basin) includes:

- sanding/blinding of well screens
- Earthquake damage to groundwater wells;
- Flood damage to groundwater wells;
- Contamination;
- Terrorism; and
- Long-term power outage.

### 5.2 Water Shortage Contingency Planning

**Requirement:** - 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)).

The California Safe Drinking Water Act mandates in Section 4029 that every public water system includes a Disaster Response Plan as part of their Emergency Notification Plan. This plan will outline the steps to be taken to maintain or return water service to the City's customers after a major disaster.

The City of Fortuna prepared a Emergency Response Plan (ERP) in 2009, which describes the actions that Fortuna will take during a catastrophic interruption of water supplies.

The shallow wells that provide water to the City of Fortuna are susceptible to two types of emergency situations, earthquakes and contamination.

In the event of a major earthquake or groundwater contamination, a water shortage contingency plan would be implemented, which would include rationing of the water storage reservoirs. However, if an earthquake were substantial enough to damage the well casing, pumping system, distribution system, and reservoirs, the water supply would diminish. In this case, another temporary water supply would need to be used. The option is to have water transported by truck from the City of Eureka.

**Requirement:** - 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)).

Within the next year, the City of Fortuna will draft and consider a water shortage contingency resolution or ordinance with prohibitions against specific water use practices and consumption reduction methods.. Table 36 and 37 are included and left blank to indicate that mandatory prohibitions and consumption reduction methods will be developed in the next year as part of the water shortage contingency resolution or ordinance.

**Requirement:** - Penalties or charges for excessive use, where applicable (10632(f)).

Within the next year, the City of Fortuna will draft and consider a water shortage contingency resolution or ordinance with prohibitions against specific water use practices. This ordinance will include penalties or charges for excessive water use.

**Requirement:** - 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)).

Within the next year, the City of Fortuna will draft and consider a water shortage contingency plan including a resolution or ordinance with consumption reduction methods and prohibitions against specific water use practices. Table 36, 37 and 38 are included and left blank to indicate that consumption reduction methods, mandatory prohibitions, and penalties will be developed in the next year as part of the water shortage contingency resolution or ordinance.

**Requirement:** - 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)).

Under a water shortage scenario, City expenses are anticipated to increase as a result of actions to augment water supply and reduce use. Revenue would decrease as a result of reduction in water sales. The City maintains supplemental funds in its financial reserves to help pay for increased expenditures to remedy shortages. These funds need to be replenished in subsequent years however, through groundwater production charges and treated water charges. The City may decide to impose or adjust its adopted groundwater production charges mid-way through the fiscal year. This allows the City to react to unanticipated changes in expenditures or revenue in a timely fashion.

**Requirement:** - A draft water shortage contingency resolution or ordinance (10632(h)).

The City of Fortuna does not have an approved or adopted water shortage contingency resolution or ordinance. A draft version of a water shortage contingency resolution is included in Appendix D. This draft ordinance has not been heard by the City Council and there has not been any action for or against adoption.

### 5.3 Water Quality

**Requirement:** - 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 (10634).

The following section describing water quality of the Eel River Valley Groundwater Basin is from California's Groundwater, Bulletin 118, 2003 update, (State of California, Department of Water Resources, 2004):

#### **Groundwater Quality**

**Characterization.** *Groundwater in the basin is characterized as magnesium-calcium bicarbonate and magnesium-sodium bicarbonate type waters. Total dissolved solids (TDS) range from 110- to 340-mg/L, averaging 237 mg/L (DWR unpublished data).*

**Impairments.** *Impairments to groundwater include high iron concentrations and locally high TDS, manganese, magnesium, calcium, boron, nitrite, and phosphorus.*

There are no potential quantitative impacts to water quality. Table 30 is included but is left blank.

### 5.4 Drought Planning

**Requirement:** - Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) an average water year, (B) a single dry water year, (C) multiple dry water years (10631(c)(1)).

Using above guidelines the City of Fortuna identified average, single-dry year (1929), and multiple-dry water years (1929-1931) as indicated in Table 27 and Table 28. Since the groundwater basin that the City of Fortuna extracts water from has a modeled potential of producing 9,743 MG to 16,243 MG per year and the City project maximum demand over the planning period is 562 MG per year the City's ability to meet the demand in drought scenarios is 100% as indicated in Tables 32-34.

**Requirement:** - 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 (10632(a)).

Within the next year, the City of Fortuna will draft and consider a water shortage contingency plan including a resolution or ordinance with consumption reduction methods and prohibitions against specific water use practices. The water shortage contingency plan will include the identification of the water shortage stages and corresponding rationing measures.

**Requirement:** - 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)).

**Requirement:** - A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis 10632(i).

In times of shortage, staff will intensify its monitoring and evaluation of the following activities:

- Monthly and season-to-date rainfall at the nearest stations within the county;
- Reservoir storages, and groundwater basin conditions; and
- Current retailer water use compared to a desired decrease in use.

**Requirement:** - Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier (10635(a)).

Since the groundwater basin that the City of Fortuna extracts water from has a modeled potential of producing 9,743 MG to 16,243 MG per year and the City's projected maximum demand over the planning period is 562 MG per year the City's ability to meet the demand in drought scenarios is 100% as indicated in Tables 32-34.

## SECTION 6 DEMAND MANAGEMENT MEASURES

### 6.1 DMMs

**Requirement:** - (Describe and provide a schedule of implementation for) 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: (A) water survey programs for single-family residential and multifamily residential customers; (B) residential plumbing retrofit; (C) system water audits, leak detection, and repair; (D) metering with commodity rates for all new connections and retrofit of existing connections; (E) large landscape conservation programs and incentives; (F) high-efficiency washing machine rebate programs; (G) public information programs; (H) school education programs; (I) conservation programs for commercial, industrial, and institutional accounts; (J) wholesale agency programs; (K) conservation pricing; (L) water conservation coordinator; (M) water waste prohibition; (N) residential ultra-lowflush toilet replacement programs (10631(f)(1) and (2)).

**Requirement:** - A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan (10631(f)(3)).

**Requirement:** - 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 supplier's ability to further reduce demand (10631(f)(4)).

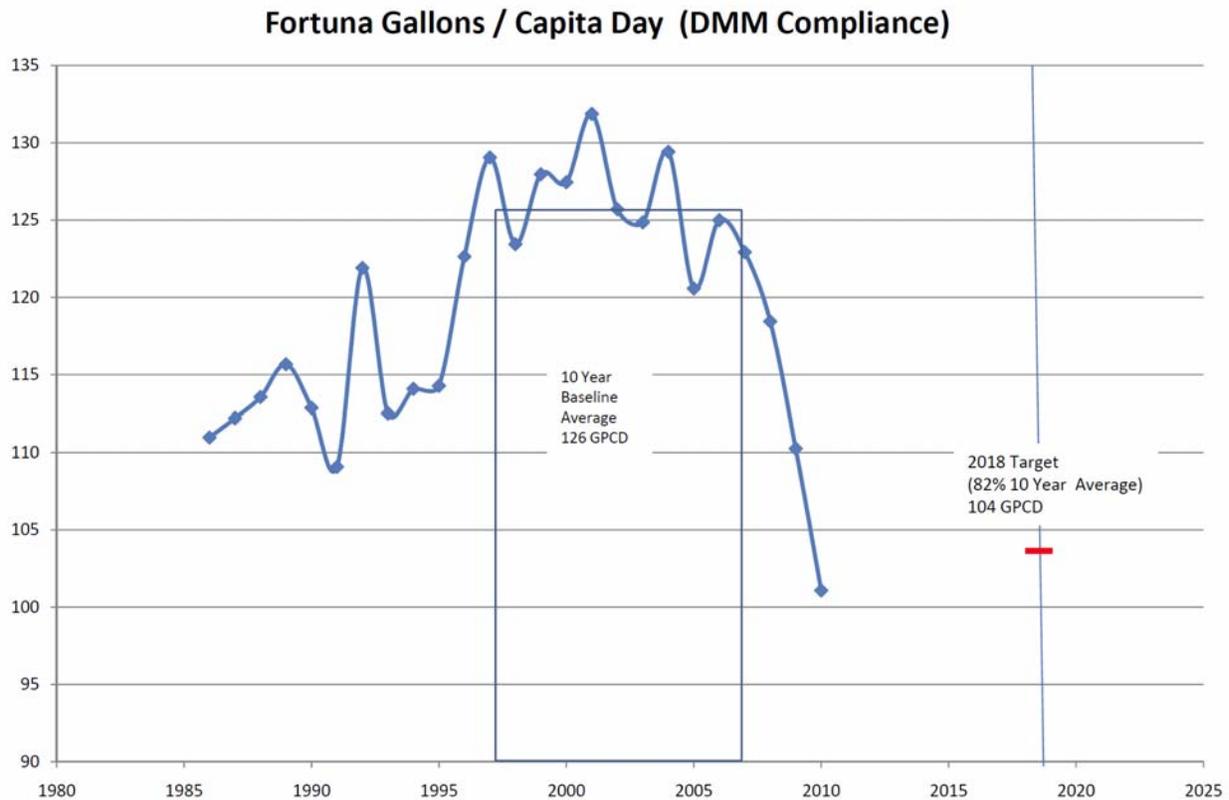
**Requirement:** - An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation (10631(g)).

The City of Fortuna is implementing or scheduled to implement all of the 15 DMMs/Best Management Practices (BMPs) as indicated in Appendix E. Additional information regarding each DMM/BMP is included below.

#### **DMM A- Water Survey for Single/Multi-Family Residential Customers**

Given that DMM A is not a foundational DMM, the City is allowed to use an alternative conservation approach for compliance. The City of Fortuna using the Gallons Per Capita Day (GPCD) alternative conservation approach to implement DMM A. This approach requires achieving an 18% reduction of GPCD from the average of a defined 10 year baseline period by 2018. The average water consumption over the 10 year baseline period for the City of Fortuna is 126GPCD. The required 18% reduction by 2018 results in a 104 GPCD target. The City of Fortuna converted their water billing to a consumptive pricing in 2006 and increased rates over a five-year period from 2006 to 2010. The result of this action has been the dramatic reduction

from over 125 GPCD in 2006 to 101 GPCD in 2010. As seen in the graph below, the 2018 goal has been met and surpassed. With scheduled implementation of additional DMMs it is anticipated that there will be additional reductions of GPCD over the next 5 years.



There are no additional steps necessary to implement the measure given that implementation was achieved through an alternative conservation measures (GPCD).

Implementation was achieved through alternative conservation measures and there is no additional schedule of implementation.

The method used to evaluate the effectiveness of the DMM A is the measure of GPCD reduction as illustrated in the graph above.

**DMM B- Residential Plumbing Retrofit**

Given that DMM B is not a foundational DMM, the City is allowed to use an alternative conservation approach for compliance. The City of Fortuna used the Gallons Per Capita Day (GPCD) alternative conservation approach to implement DMM A. This approach requires achieving an 18% reduction of GPCD from the average of a defined 10 year baseline period by 2018. The average water consumption over the 10 year baseline period for the City of Fortuna is 126 GPCD. The required 18% reduction by 2018 results in a 104 GPCD target. The City of Fortuna converted their water billing to a consumptive pricing in 2006 and increased rates over a five-year period from 2006 to 2010. The result of this action has been the dramatic reduction from over 125 GPCD in 2006 to 101 GPCD in 2010. The 2018 goal has been met.

There are no additional steps necessary to implement the measure given that implementation was achieved through an alternative conservation measures (GCPD).

Implementation was achieved through alternative conservation measures and there is no additional schedule of implementation.

The method used to evaluate the effectiveness of DMM B is the measure of GPCD reduction as illustrated in the graph above.

### **DMM C- System Water Audits, Leak Detection**

The City of Fortuna completed comprehensive leak detection surveys in 1983 and 1986. Currently one of the four groundwater source wells is not being metered. This may be causing the negative system losses seen since 1998. To implement this BMP the City of Fortuna will:

- Begin implementation of the BMP in July 2011;
- Install a meter on the un-metered groundwater well (by December 2011);
- Collect pumping and metered sales data for 2012 and 2013;
- Perform a water audit using the American Water Works Association (AWWA) software by year two of implementation (2013);
- Staff to be trained on AWWA audit method and component analysis offered by California Urban Water Conservation Council (CUWCC) and AWWA.;
- Complete analysis of real losses by the end of year four of implementation (2015); and
- Document progress years 5 through 10 of implementation (2015 through 2020).

The City of Fortuna will use gallons per services connection per day or gallons per mile of distribution line per day to evaluate the effectiveness of the DMMs.

### **DMM D- Metering with Commodity Rates for All New connections**

DMM D has been implemented by the City of Fortuna. The required documentation of DMM D implementation is provided below:

- The City of Fortuna requires meters for all new service connections;
- All water services in Fortuna are metered. There are no un-metered services in the Fortuna services area; and
- The City of Fortuna reads water service meters every month resulting in 12 actual meter readings per year.

DMM D documentation includes:

- Fortuna has 4,303 metered accounts as of 2010;
- Fortuna reads 4,303 meters for metered accounts;
- Fortuna bills 4,303 accounts by volume; and
- Fortuna has no un-metered water accounts.

The additional steps necessary to implement DMM D include:

- Preparation of a written plan, policy or program (by July 2012) that includes;
  - A census of all meters, by size, type, year installed, customer class serviced and manufactures warranty accuracy when new;
  - A current and approved schedule of meter testing and repair, by size, type and customer class; and
  - A current and approved schedule of meter replacement, by size, type and customer class.

- Conduct a feasibility study to identify intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape irrigation meters, and conduct a feasibility study to assess the merits of a program incentives to switch mixed use accounts to dedicated landscape meters (July 2015).

A current and approved schedule of meter testing and repair, by size, type and customer class.

The effectiveness of this DMM will be measured by the percentage of un-metered accounts that are retrofitted (100%).

**DMM E- Large Landscape Conservation Programs and Incentives**

Given that DMM E is not a foundational DMM, the City is allowed to use an alternative conservation approach for compliance. The City of Fortuna uses the Gallons Per Capita Day (GPCD) alternative conservation approach to implement DMM A. This approach requires achieving an 18% reduction of GCPD from the average of a defined 10 year baseline period by 2018. The average water consumption over the 10 year baseline period for the City of Fortuna is 126 GPCD. The required 18% reduction by 2018 results in a 104 GPCD target. The City of Fortuna converted their water billing to a consumptive pricing in 2006 and increased rates over a five-year period from 2006 to 2010. The result of this action has been the dramatic reduction from over 125 GPCD in 2006 to 101 GPCD in 2010. As seen in the graph contained in the description of DMM A, the 2018 goal has been met and surpassed. With scheduled implementation of additional DMMs it is anticipated that there will be additional reductions of GPCD over the next 5 years.

There are no additional steps necessary to implement the measure given that implementation was achieved through an alternative conservation measures (GCPD).

Implementation was achieved through alternative conservation measures and there is no additional schedule of implementation.

The method used to evaluate the effectiveness of the DMM E is the measure of GPCD reduction as illustrated in the graph contained in the description of DMM A.

**DMM F- High-Efficiency Washing Machine Rebate Programs**

Given that DMM F is not a foundational DMM, the City is allowed to use an alternative conservation approach for compliance. The City of Fortuna uses the Gallons Per Capita Day (GPCD) alternative conservation approach to implement DMM A. This approach requires achieving an 18% reduction of GCPD from the average of a defined 10 year baseline period by 2018. The average water consumption over the 10 year baseline period for the City of Fortuna is 126 GPCD. The required 18% reduction by 2018 results in a 104 GPCD target. The City of Fortuna converted their water billing to a consumptive pricing in 2006 and increased rates over a five-year period from 2006 to 2010. The result of this action has been the dramatic reduction from over 125 GPCD in 2006 to 101 GPCD in 2010. As seen in the graph contained in the description of DMM A, the 2018 goal has been met and surpassed. With scheduled implementation of additional DMMs it is anticipated that there will be additional reductions of GPCD over the next five years.

There are no additional steps necessary to implement the measure given that implementation was achieved through alternative conservation measures (GCPD).

Implementation was achieved through alternative conservation measures and there is no additional schedule of implementation.

The method used to evaluate the effectiveness of DMM F is the measure of GPCD reduction as illustrated in the graph contained in the description of DMM A.

#### **DMM G- Public Information**

The City of Fortuna plans to fully implement DMM G by July of 2012. Implementation includes:

- Contacts with the public four times a year;
- Contact with media 4 times a year;
- Maintain and update the City website 4 times a year;
- Compile public education materials;
- Preparation of an annual budget for public education; and
- Preparation of a description of all other outreach programs.

The above implementation steps will be completed by July 2012.

The method used to evaluate the effectiveness of DMM G is the measure of GPCD reduction as illustrated in the graph contained in the description of DMM A.

#### **DMM H- School Education**

The City of Fortuna plans to fully implement DMM H by July of 2012. Implementation includes:

- The City will develop and or provide curriculum materials including confirmation that the materials meet state education requirements and are grade-level appropriate;
- Distribution of curriculum;
- Preparation of an annual budget for school education;
- Preparation of a description of the materials used for this requirement; and
- Preparation of a description of all other water supplier education programs.

The above listed steps necessary to implement the measure will be completed by July 2012.

The method used to evaluate the effectiveness of the DMM H is the measure of GPCD reduction as illustrated in the graph contained in the description of DMM A.

#### **DMM I- Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts**

Given that DMM I is not a foundational DMM, the City is allowed to use an alternative conservation approach for compliance. The City of Fortuna uses the Gallons Per Capita Day (GPCD) alternative conservation approach to implement DMM A. This approach requires achieving an 18% reduction of GPCD from the average of a defined 10 year baseline period by 2018. The average water consumption over the 10 year baseline period for the City of Fortuna is 126 GPCD. The required 18% reduction by 2018 results in a 104 GPCD target. The City of Fortuna converted their water billing to a consumptive pricing in 2006 and increased rates over a five-year period from 2006 to 2010. The result of this action has been the dramatic reduction from over 125 GPCD in 2006 to 101 GPCD in 2010. As seen in the graph contained in the description of DMM A, the 2018 goal has been met and surpassed. With scheduled implementation of additional DMMs it is anticipated that there will be additional reductions of GPCD over the next five years.

There are no additional steps necessary to implement the measure given that implementation was achieved through an alternative conservation measure (GCPD).

Implementation was achieved through alternative conservation measures and there is no additional schedule of implementation.

The method used to evaluate the effectiveness of the DMM I is the measure of GPCD reduction as illustrated in the graph contained in the description of DMM A.

#### **DMM J- Wholesale Agency Assistance Programs**

Since the City of Fortuna is not a wholesale agency they are not required to comply with this DMM.

#### **DMM K- Conservation Pricing**

The City of Fortuna will complete implementation of DMM K by July, 2012. The City of Fortuna is working on a water and wastewater rate study with Oscar Larson & Associates that will satisfy the conservation pricing requirements.

The steps necessary to implement the measure include:

- Completion of the rate study;
- Presentation of the recommended rate structure to the City Council; and
- City Council consideration and approval or denial.

The above implementation steps listed above will be completed by July, 2012 and final implementation of conservation pricing by year four (2015). If it is determined that it is not economical to implement conservation pricing the City of Fortuna will provide the necessary cost benefit analysis by July 2012.

#### **DMM L- Conservation Coordinator**

The City of Fortuna has assigned an environmental consultant, Orrin Plocher of Freshwater Environmental Services to be the conservation coordinator for the City of Fortuna. The conservation coordinator is responsible for program management, tracking, planning and reporting on BMP implementation. The conservation coordinator's contact information is provided below:

Orrin Plocher  
Freshwater Environmental Services  
78 Sunny Brae Center  
Arcata, CA 95521  
707-839-0091

The City of Fortuna has implemented DMM L.

The method used to evaluate the effectiveness of DMM L is the measure of GPCD reduction as illustrated in the graph contained in the description of DMM A.

#### **DMM M- Water Waste Prohibitions**

The City of Fortuna will complete implementation of DMM M by July, 2012. The City of Fortuna will prepare a water waste ordinance with enforcement measures.

The steps necessary to implement the measure include:

- Prepare draft ordinance;
- Present draft ordinance to the City Council; and
- City Council consideration and approval or denial.

The above implementation steps listed above will be completed by July, 2012.

#### **DMM N- Residential Ultra Low-Flow Toilet (ULFT) Replacement Programs**

Given that DMM N is not a foundational DMM, the City is allowed to use an alternative conservation approach for compliance. The City of Fortuna uses the Gallons Per Capita Day (GPCD) alternative conservation approach to implement DMM A. This approach requires achieving an 18% reduction of GPCD from the average of a defined 10 year baseline period by 2018. The average water consumption over the 10 year baseline period for the City of Fortuna is 126 GPCD. The required 18% reduction by 2018 results in a 104 GPCD target. The City of Fortuna converted their water billing to a consumptive pricing in 2006 and increased rates over a five-year period from 2006 to 2010. The result of this action has been the dramatic reduction from over 125 GPCD in 2006 to 101 GPCD in 2010. The 2018 goal has been met. With scheduled implementation of additional DMMs it is anticipated that there will be additional reductions of GPCD over the next five years.

There are no additional steps necessary to implement the measure given that implementation was achieved through an alternative conservation measure (GPCD).

Implementation was achieved through an alternative conservation measure and there is no additional schedule of implementation.

The method used to evaluate the effectiveness of the DMM N is the measure of GPCD reduction as illustrated in the graph contained in the description of DMM A.

## SECTION 7 REFERENCES

California Department of Water Resources. 1975. California's Groundwater. California Department of Water Resources. Bulletin 118.

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Evenson, R.E. 1959. Geology and Ground Water Features of Eureka Area, Humboldt County, California. USGS Water Supply Paper 1470.

Strand, 1963. Geologic Map of California, [Redding Sheet]. Scale 1:250,000. California Division of Mines and Geology.

## **TABLES**

Table 1 Coordination with appropriate agencies							
Coordinating Agencies <sup>1,2</sup>	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
Town of Scotia Community Services District						X	
City of Rio Dell						X	
Palmer Creek Community Services District						X	
Humboldt County						X	
General public			X			X	
Other							

<sup>1</sup> Indicate the specific name of the agency with which coordination or outreach occurred.  
<sup>2</sup> Check at least one box in each row.

Table 2 Population – current and projected							
	2010	2015	2020	2025	2030	2035 - optional	Data source <sup>2</sup>
Service area population <sup>1</sup>	11,926	12,722	13,570	14,476	15,441		US Census

<sup>1</sup> Service area population is defined as the population served by the distribution system. See Technical Methodology 2: Service Area Population (2010 UWMP Guidebook, Section M).  
<sup>2</sup> Source of the population data- US Census.  
 Census data with average population growth of 1.3 % (1.3% average annual growth per last 10 years, CDOF)

Table 3 Water deliveries — actual, 2005					
Water use sectors	Metered		Not metered		Total
	# of accounts	Volume	# of accounts	Volume	Volume
Single family	3,855	266	0	0	266
Multi-family	combined with single family	81	0	0	81
Commercial	404	75	0	0	75
Industrial	3	59	4	0	59
Institutional/governmental	0	0	0	0	0
Landscape	0	0	4	0	0
Agriculture	1	12	7	0	12
Other					0
<b>Total</b>	<b>4,263</b>	<b>493</b>	<b>15</b>	<b>0</b>	<b>493</b>

Units : million gallons per year

Table 4 Water deliveries — actual, 2010					
Water use sectors	Metered		Not metered		Total
	# of accounts	Volume	# of accounts	Volume	Volume
Single family	3,734	258	0	0	258
Multi-family	183	70	0	0	70
Commercial	358	62	0	0	62
Industrial	2	37	0	0	37
Institutional/governmental	0	0	0	0	0
Landscape	25	13	0	0	13
Agriculture	1	0	0	0	0
Other	0	0	0	0	0
<b>Total</b>	<b>4,303</b>	<b>440</b>	<b>0</b>	<b>0</b>	<b>440</b>

Units : million gallons per year

**Table 5**  
Water deliveries — projected, 2015

Water use sectors	2015				
	Metered		Not metered		Total
	# of accounts	Volume	# of accounts	Volume	Volume
Single family	3,969	274			274
Multi-family	195	74			74
Commercial	381	66			66
Industrial	2	39			39
Institutional/governmental	0	0			0
Landscape	27	14			14
Agriculture	1	0			0
Other	0	0			0
<b>Total</b>	<b>4,574</b>	<b>468</b>	<b>0</b>	<b>0</b>	<b>468</b>

*Units : million gallons per year*

**Table 6**  
Water deliveries — projected, 2020

Water use sectors	2020				
	Metered		Not metered		Total
	# of accounts	Volume	# of accounts	Volume	Volume
Single family	4,219	292			292
Multi-family	207	79			79
Commercial	405	70			70
Industrial	2	42			42
Institutional/governmental	0	0			0
Landscape	28	15			15
Agriculture	1	0			0
Other	0	0			0
<b>Total</b>	<b>4,862</b>	<b>497</b>	<b>0</b>	<b>0</b>	<b>497</b>

*Units : million gallons per year*

**Table 7**  
Water deliveries — projected 2025, 2030, and 2035

Water use sectors	2025		2030		2035 - optional	
	metered		metered		metered	
	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume
Single family	4,485	310	4,768	329		
Multi-family	220	84	234	89		
Commercial	430	74	457	79		
Industrial	2	44	3	47		
Institutional/governmental	0	0	0	0		
Landscape	30	16	32	17		
Agriculture	1	0	1	0		
Other	0	0	0	0		
<b>Total</b>	<b>5,169</b>	<b>529</b>	<b>5,494</b>	<b>562</b>		<b>0</b>

*Units : million gallons per year*

Table 8 Low-income projected water demands					
Low Income Water Demands <sup>1</sup>	2015	2020	2025	2030	2035 - opt
Single-family residential	16	17	18	19	
Multi-family residential	4	5	5	5	
<b>Total</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>25</b>	<b>0</b>

*Units : million gallons per year*

<sup>1</sup> Provide demands either as directly estimated values or as a percent of demand.

Table 9 Sales to other water agencies							
Water distributed	2005	2010	2015	2020	2025	2030	2035 - opt
No sales to any other water agencies currently of planned	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>						

*Units : million gallons per year*

Table 10 Additional water uses and losses							
Water use <sup>1</sup>	2005	2010	2015	2020	2025	2030	2035 -opt
Saline barriers	0	0	0	0	0	0	
Groundwater recharge	0	0	0	0	0	0	
Conjunctive use	0	0	0	0	0	0	
Raw water	0	0	0	0	0	0	
Recycled water	0	0	0	0	0	0	
System losses	0	0	0	0	0	0	
Other (define)	0	0	0	0	0	0	
<b>Total</b>	<b>0</b>						

*Units : million gallons per year*

<sup>1</sup> Any water accounted for in Tables 3 through 7 are not included in this table.

Table 11 Total water use							
Water Use	2005	2010	2015	2020	2025	2030	2035 - opt
Total water deliveries (from Tables 3 to 7)	493	440	468	497	529	562	
Sales to other water agencies (from Table 9)	0	0	0	0	0	0	
Additional water uses and losses (from Table 10)	0	0	0	0	0	0	
<b>Total</b>	<b>493</b>	<b>440</b>	<b>468</b>	<b>497</b>	<b>529</b>	<b>562</b>	<b>0</b>

*Units : million gallons per year*

Table 12 Retail agency demand projections provided to wholesale suppliers							
Wholesaler	Contracted Volume <sup>3</sup>	2010	2015	2020	2025	2030	2035 -opt
NA	0	0	0	0	0	0	0
NA	0	0	0	0	0	0	0
NA	0	0	0	0	0	0	0

**Table 13**  
**Base period ranges**

Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	498	see below
	2008 total volume of delivered recycled water	0	see below
	2008 recycled water as a percent of total deliveries	0	percent
	Number of years in base period <sup>1</sup>	10	years
	Year beginning base period range	1/1/1996	
	Year ending base period range <sup>2</sup>	12/31/2005	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2003	
	Year ending base period range <sup>3</sup>	12/31/2007	

**Units : million gallons per year**

<sup>1</sup> If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the am

<sup>2</sup>The ending year must be between December 31, 2004 and December 31, 2010.

<sup>3</sup>The ending year must be between December 31, 2007 and December 31, 2010.

**Table 14**  
**Base daily per capita water use — 10- to 15-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	1996	10075	1.236	123
Year 2	1997	10063	1.299	129
Year 3	1998	10214	1.261	123
Year 4	1999	10234	1.310	128
Year 5	2000	10512	1.340	127
Year 6	2001	10637	1.403	132
Year 7	2002	10745	1.351	126
Year 8	2003	10884	1.359	125
Year 9	2004	11008	1.425	129
Year 10	2005	11202	1.351	121
Year 11				
Year 12				
Year 13				
Year 14				
Year 15				
<b>Base Daily Per Capita Water Use<sup>1</sup></b>				<b>126</b>

<sup>1</sup> Add the values in the column and divide by the number of rows.

**Table 15**  
**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	2003	10884	1.3589	125
Year 2	2004	11008	1.4247	129
Year 3	2005	11202	1.3507	121
Year 4	2006	11266	1.4082	125
Year 5	2007	11255	1.3836	123
<b>Base Daily Per Capita Water Use<sup>1</sup></b>				<b>125</b>

<sup>1</sup> Add the values in the column and divide by the number of rows.

Table 16							
Water supplies — current and projected							
Water Supply Sources		2010	2015	2020	2025	2030	2035 - opt
Water purchased from <sup>1</sup> :	Wholesaler supplied volume (yes/no)	No	No	No	No	No	No
Wholesaler 1 (enter agency name)	No	0	0	0	0	0	0
Supplier-produced groundwater <sup>2</sup> Eel River Groundwater basin		440	468	497	529	562	0
		0	0	0	0	0	0
Transfers in		0	0	0	0	0	0
Exchanges In		0	0	0	0	0	0
Recycled Water		0	0	0	0	0	0
Desalinated Water		0	0	0	0	0	0
Other		0	0	0	0	0	0
Other		0	0	0	0	0	0
<b>Total</b>		<b>440</b>	<b>468</b>	<b>497</b>	<b>529</b>	<b>562</b>	<b>0</b>

*Units : million gallons per year*

<sup>1</sup> Volumes shown here should be what was purchased in 2010 and what is anticipated to be purchased in the future. If these numbers differ from what is contracted, show the contracted quantities in Table 17.

<sup>2</sup> Volumes shown here should be consistent with Tables 17 and 18.

Table 17						
Wholesale supplies — existing and planned sources of water						
Wholesale sources <sup>1,2</sup>	Contracted Volume <sup>3</sup>	2015	2020	2025	2030	2035 - opt
NA	0	0	0	0	0	0
NA	0	0	0	0	0	0
NA	0	0	0	0	0	0

*Units : million gallons per year*

<sup>1</sup> Water volumes presented here should be accounted for in Table 16.

<sup>2</sup> If the water supplier is a wholesaler, indicate all customers (excluding individual retail customers) to which water is sold. If the water supplier is a retailer, indicate each wholesale supplier, if more than one.

<sup>3</sup> Indicate the full amount of water

Table 18						
Groundwater — volume pumped						
Basin name(s)	Metered or Unmetered <sup>1</sup>	2006	2007	2008	2009	2010
Eel River Groundwater Basin	Metered	514.50	485.70	489.00	435.90	439.60
<b>Total groundwater pumped</b>		<b>514.50</b>	<b>485.70</b>	<b>489.00</b>	<b>435.90</b>	<b>439.60</b>
<b>Groundwater as a percent of total water supply</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

*Units : million gallons per year*

<sup>1</sup> Indicate whether volume is based on volumetric meter data or another method

Table 19					
Groundwater — volume projected to be pumped					
Basin name(s)	2015	2020	2025	2030	2035 - opt
Eel River Groundwater Basin	469	497	529	562	0
<b>Total groundwater pumped</b>	469	497	529	562	0
<b>Percent of total water supply</b>	100%	100%	100%	100%	100%

*Units : million gallons per year*  
*Include future planned expansion*

Table 20			
Transfer and exchange opportunities			
Transfer agency	Transfer or exchange	Short term or long term	Proposed Volume
NA	NA	NA	NA
NA	NA	NA	NA
NA	NA	NA	NA
NA	NA	NA	NA
<b>Total</b>			

*Units : million gallons per year*

Table 21							
Recycled water — wastewater collection and treatment							
Type of Wastewater	2005	2010	2015	2020	2025	2030	2035 - opt
Wastewater collected & treated in service area	438	438	466	496	528	562	
Volume that meets recycled water standard	0	0	0	0	0	0	

*Units : million gallons per year*

Table 22							
Recycled water — non-recycled wastewater disposal							
Method of disposal	Treatment Level	2010	2015	2020	2025	2030	2035 - opt
Name of method							
Name of method							
Name of method							
Name of method							
<b>Total</b>		0	0	0	0	0	0

*Units : million gallons per year*

Table 23

## Recycled water — potential future use

User type	Description	Feasibility <sup>1</sup>	2015	2020	2025	2030	2035 - opt
Agricultural irrigation							
Landscape irrigation <sup>2</sup>							
Commercial irrigation <sup>3</sup>							
Golf course irrigation							
Wildlife habitat							
Wetlands							
Industrial reuse							
Groundwater recharge							
Seawater barrier							
Getothermal/Energy							
Indirect potable reuse							
Other (user type)							
Other (user type)							
<b>Total</b>		0	0	0	0	0	0

Units : million gallons per year

<sup>1</sup> Technical and economic feasibility.

<sup>2</sup> Includes parks, schools, cemeteries, churches, residential, or other public facilities)

<sup>3</sup> Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)

Table 24

## Recycled water — 2005 UWMP use projection compared to 2010 actual

Use type	2010 actual use	2005 Projection for 2010 <sup>1</sup>
Agricultural irrigation	0	NA
Landscape irrigation <sup>2</sup>	0	NA
Commercial irrigation <sup>3</sup>	0	NA
Golf course irrigation	0	NA
Wildlife habitat	0	NA
Wetlands	0	NA
Industrial reuse	0	NA
Groundwater recharge	0	NA
Seawater barrier	0	NA
Getothermal/Energy	0	NA
Indirect potable reuse	0	NA
Other (user type)	0	NA
Other (user type)	0	NA
<b>Total</b>		0

Units (circle one): million gallons per year

<sup>1</sup>From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing categories or modified to the new categories, at the discretion of the water supplier.

<sup>2</sup> Includes parks, schools, cemeteries, churches, residential, or other public facilities)

<sup>3</sup> Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)

Table 25

Methods to encourage recycled water use

Actions	Projected Results					
	2010	2015	2020	2025	2030	2035 - opt
Financial incentives (none currently, none planned)						
name of action (none currently, none planned)						
name of action (none currently, none planned)						
<b>Total</b>	0	0	0	0	0	0

*Units : million gallons per year*

Table 26

Future water supply projects

Project name <sup>1</sup>	Projected start date	Projected completion date	Potential project constraints <sup>2</sup>	Normal-year supply <sup>3</sup>	Single-dry year supply <sup>3</sup>	Multiple-dry year first year supply <sup>3</sup>	Multiple-dry year second year supply <sup>3</sup>	Multiple-dry year third year supply <sup>3</sup>
No projects needed or planned								
<b>Total</b>				0	0	0	0	0

*Units : million gallons per year*

<sup>1</sup> Water volumes presented here should be accounted for in Table 16.

<sup>2</sup> Indicate whether project is likely to happen and what constraints, if any, exist for project implementation.

<sup>3</sup> Provide estimated supply benefits, if available.

Table 27 Basis of water year data	
Water Year Type	Base Year(s)
Average Water Year	1905-2010
Single-Dry Water Year	1929
Multiple-Dry Water Years	1929-1931

Table 28 Supply reliability — historic conditions					
Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
		Year 1	Year 2	Year 3	Year 4
37.08	21.17	25.46	25.46	25.46	
Percent of Average/Normal Year:	57	68.66	68.66	68.66	

Table 29 Factors resulting in inconsistency of supply							
Water supply sources <sup>1</sup>	Specific source name, if any	Limitation quantification	Legal	Environmental	Water quality	Climatic	Additional information
Ground Water	Eel River Basin	9,772		X	X	X	Earthquake could damage wells .

*Units: million gallons per year*

<sup>1</sup> From Table 16.

Table 30 Water quality — current and projected water supply impacts							
Water source	Description of condition	2010	2015	2020	2025	2030	2035 - opt
Ground Water Eel River Groundwater Basin							

*Units: million gallons per year*

**Table 31  
Supply reliability — current water sources**

Water supply sources <sup>1</sup>	Average / Normal Water Year Supply <sup>2</sup>	Multiple Dry Water Year Supply <sup>2</sup>		
		Year 2011	Year 2012	Year 2013
Ground Water Eel River Groundwater Basin	37.08	445	451	457
	0	0	0	0
Percent of normal year:		100.0%	100.0%	100.0%

**Units: million gallons per year**

<sup>1</sup>From Table 16.

<sup>2</sup> See Table 27 for basis of water type years.

**Table 32  
Supply and demand comparison — normal year**

	2015	2020	2025	2030	2035 - opt
Supply totals (from Table 16)	468	497	529	562	
Demand totals (From Table 11)	468	497	529	562	
Difference	0	0	0	0	
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	

**Units: million gallons per year**

**Table 33  
Supply and demand comparison — single dry year**

	2015	2020	2025	2030	2035 - opt
Supply totals <sup>1,2</sup>	468	497	529	562	
Demand totals <sup>2,3,4</sup>	468	497	529	562	
Difference	0	0	0	0	
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	

**Units: million gallons per year**

<sup>1</sup>Consider the same sources as in Table 16. If

<sup>2</sup> Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.

<sup>3</sup> Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.

<sup>4</sup> The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.

Table 34 Supply and demand comparison — multiple dry-year events						
		2015	2020	2025	2030	2035 - opt
Multiple-dry year first year supply	Supply totals <sup>1,2</sup>	468	497	529	562	
	Demand totals <sup>2,3,4</sup>	468	497	529	562	
	Difference	0	0	0	0	
	Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	
Multiple-dry year second year supply	Supply totals <sup>1,2</sup>	468	497	529	562	
	Demand totals <sup>2,3,4</sup>	468	497	529	562	
	Difference	0	0	0	0	
	Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	
Multiple-dry year third year supply	Supply totals <sup>1,2</sup>	468	497	529	562	
	Demand totals <sup>2,3,4</sup>	468	497	529	562	
	Difference	0	0	0	0	
	Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	

**Units: million gallons per year**

<sup>1</sup> Consider the same sources as in Table 16. If new sources of water are planned, add a column to the table and specify the source, timing, and amount of water.

<sup>2</sup> Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.

<sup>3</sup> Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.

<sup>4</sup> The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.

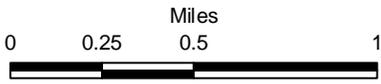
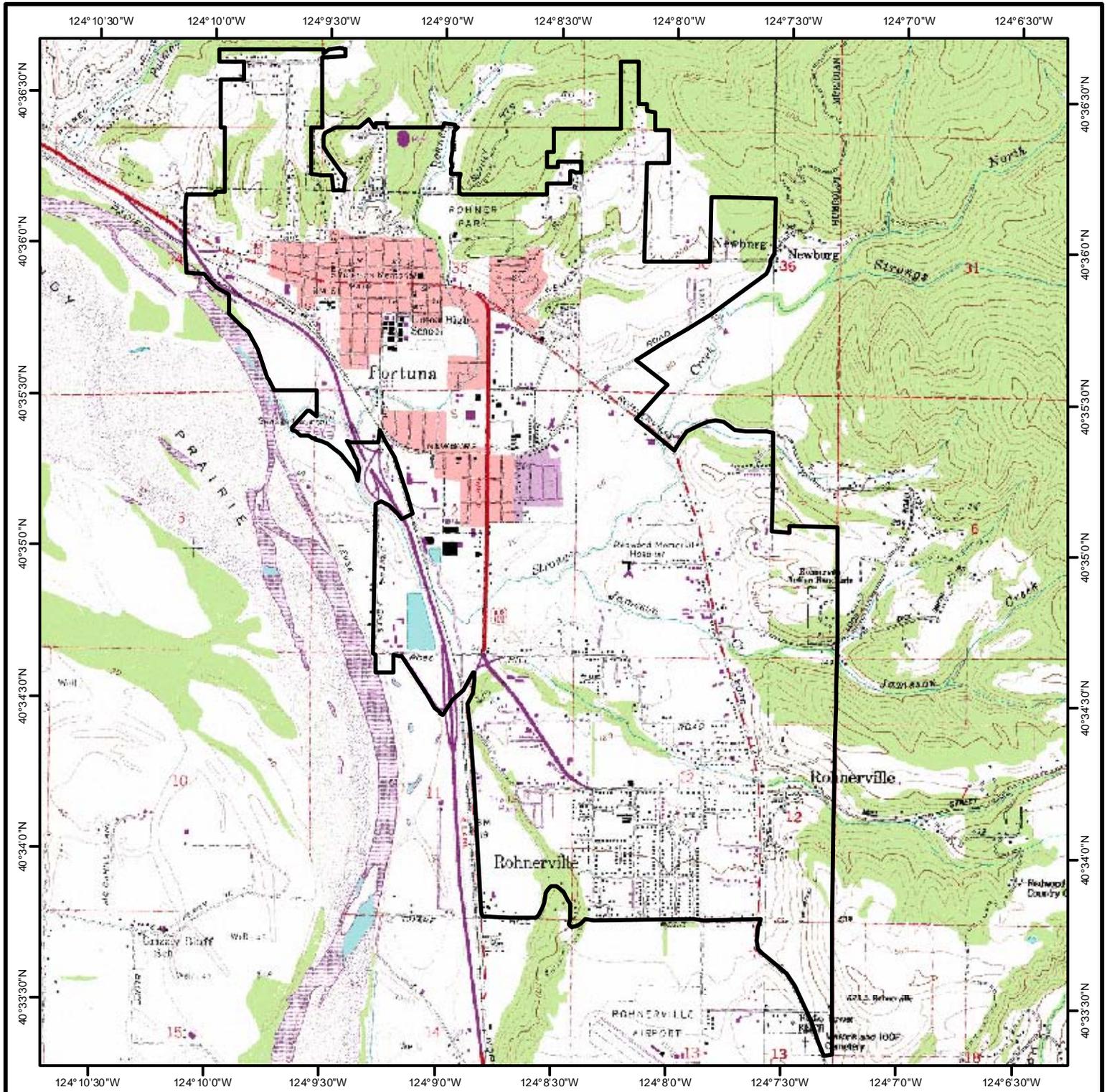
Table 35 Water shortage contingency — rationing stages to address water supply shortages		
Stage No. <sup>1</sup>	Water Supply Conditions	% Shortage

<sup>1</sup> One of the stages of action must be designed to address a 50 percent reduction in water supply.

Table 36 Water shortage contingency — mandatory prohibitions	
Examples of Prohibitions	Stage When



## FIGURES



**LEGEND**

 Approximate Boundary of City of Fortuna based on data obtained from Humboldt County GIS Department.

Base Image Data Source:  
1:24,000 Digital Raster Graph Mosaic of Humboldt County, California.

ALL LOCATIONS APPROXIMATE

**City of Fortuna  
Humboldt County, California**

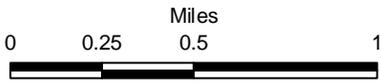
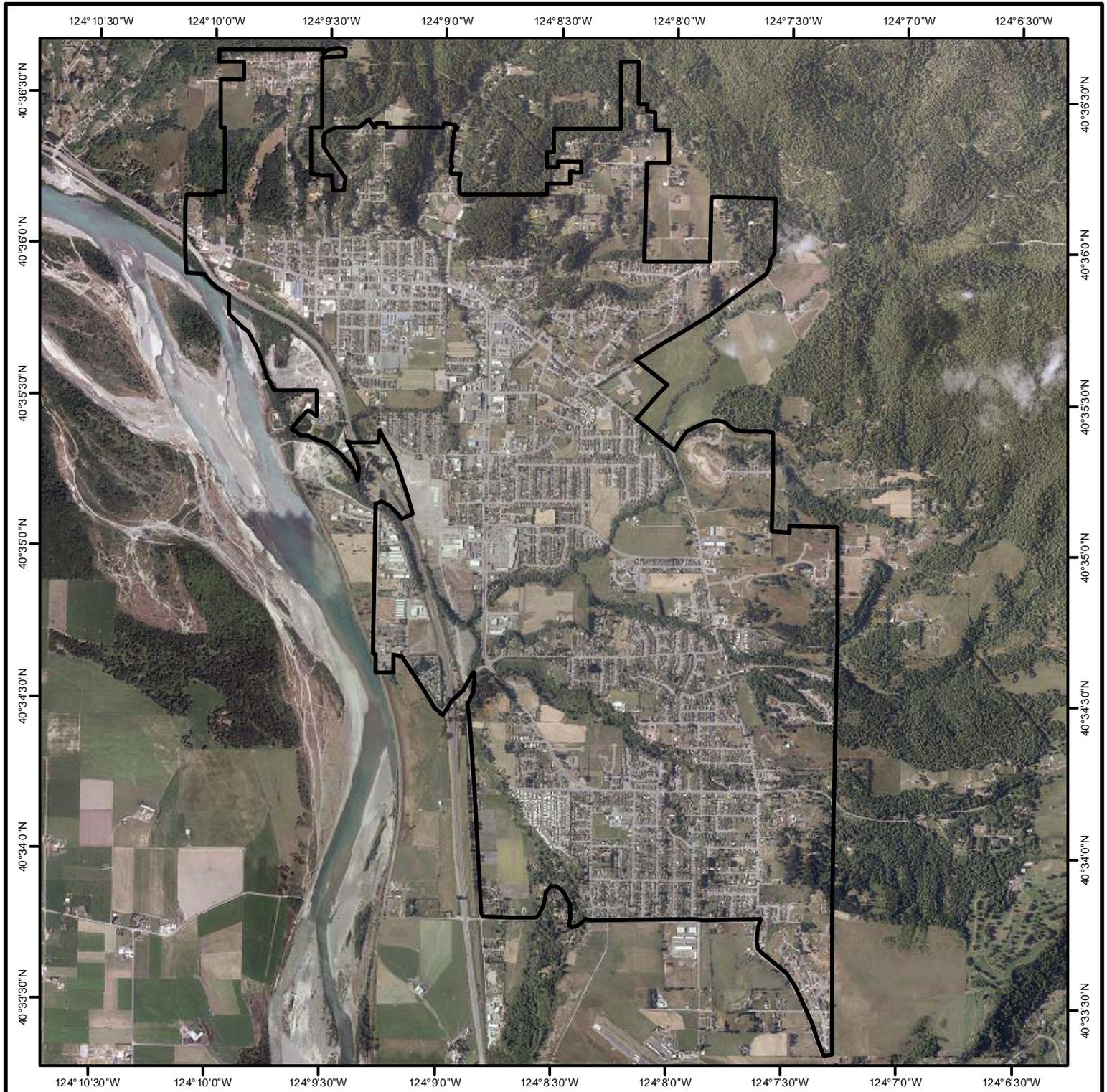
**Figure 1  
Site Location Map  
Fortuna, California**

Date: 5-26-11

By: SJT



**Freshwater Environmental Services**



**LEGEND**

 Approximate Boundary of City of Fortuna based on data obtained from Humboldt County GIS Department.

Base Image Data Source: USDA-FSA Aerial Photography Field Office Color Digital Ortho Photo Quad, Image Date June, 2010.

ALL LOCATIONS APPROXIMATE

**City of Fortuna  
Humboldt County, California**

**Figure 2  
Site Location Map  
2010 Aerial Image**



**Freshwater Environmental Services**

Date: 5-26-11

By: SJT

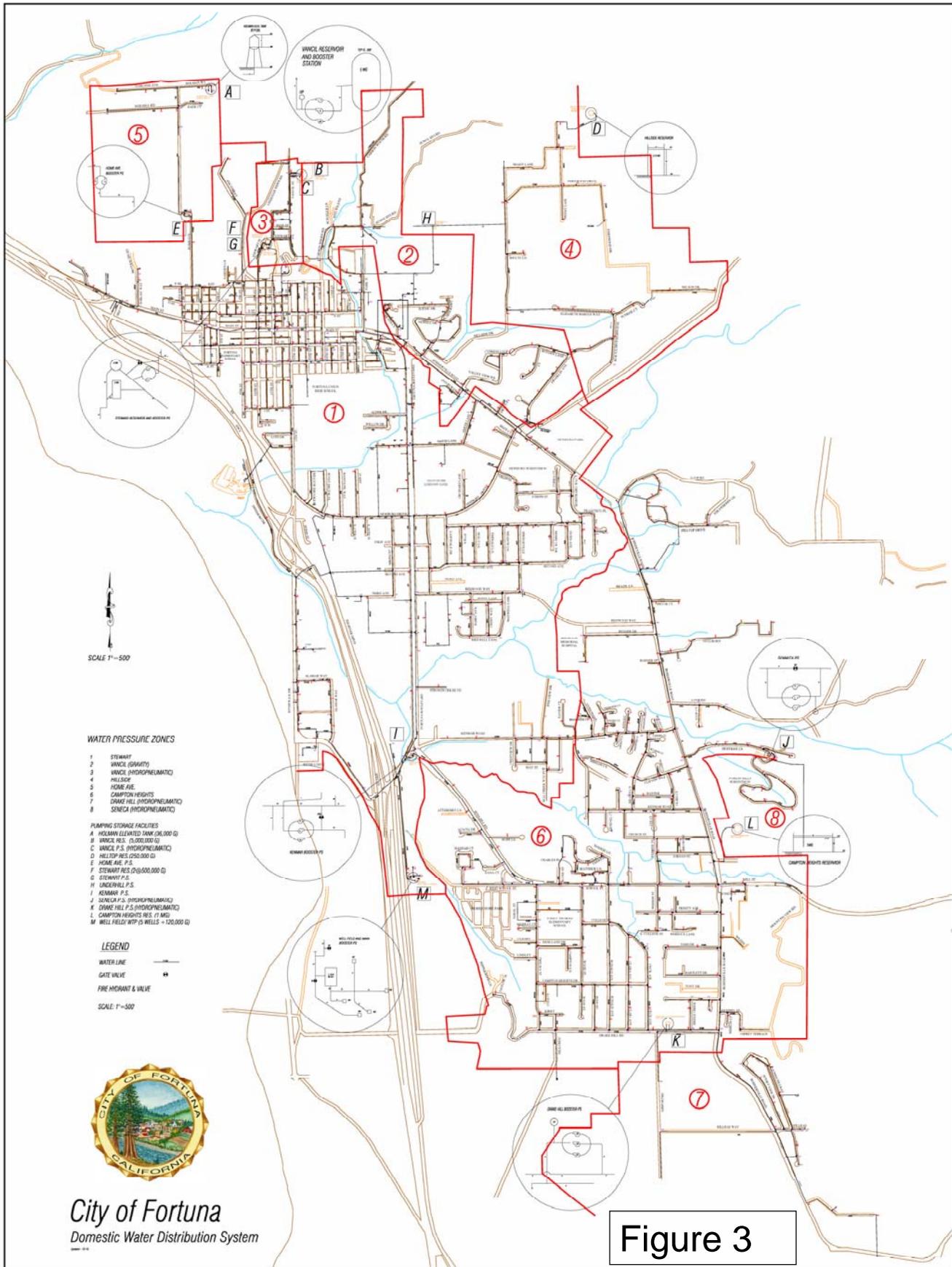
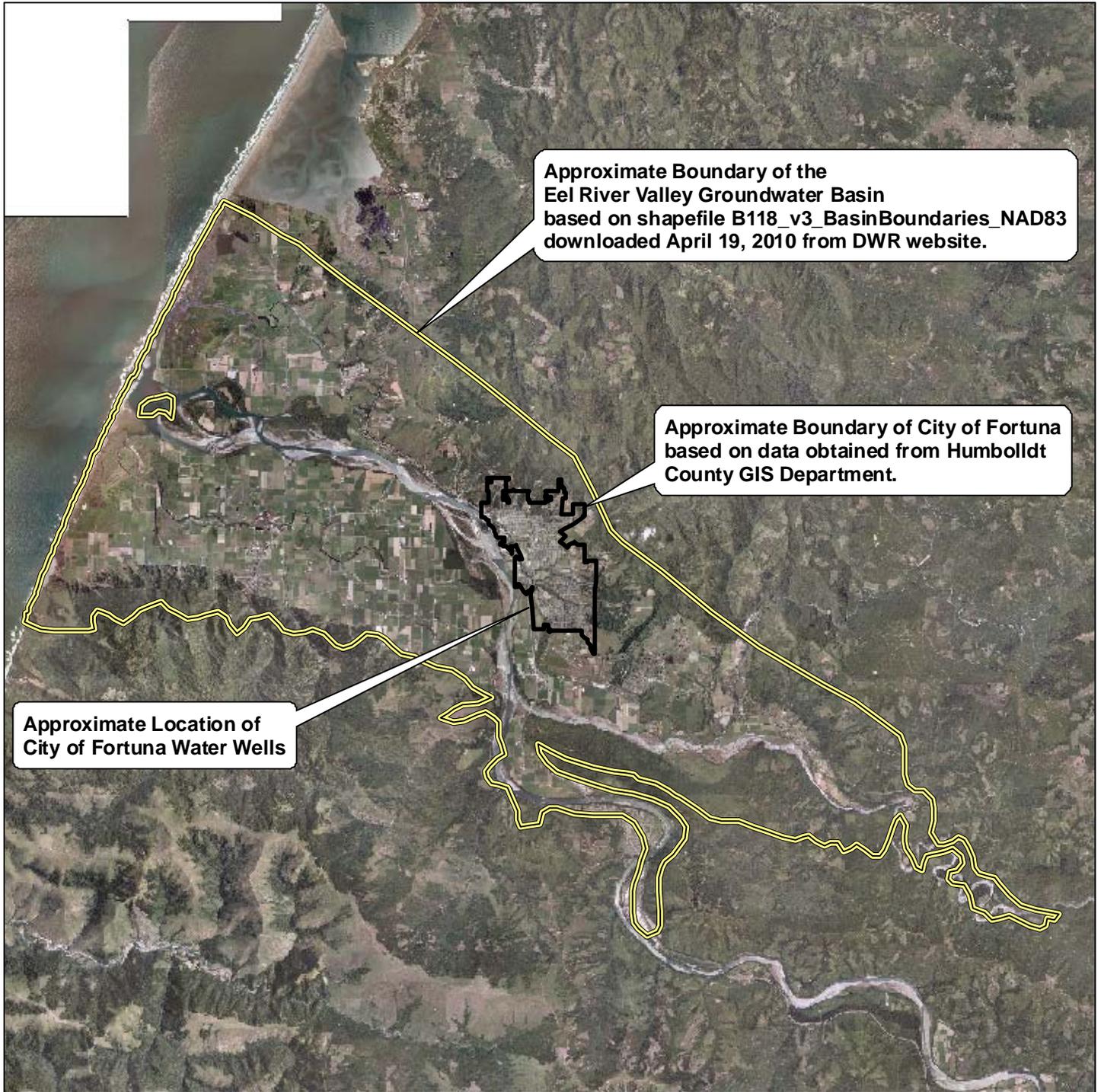


Figure 3



**LEGEND**

-  Approximate Boundary of City of Fortuna based on data obtained from Humboldt County GIS Department.

Base Image Data Source: USDA-FSA Aerial Photography Field Office Color Digital Ortho Photo Quad, Image Date June, 2010.

ALL LOCATIONS APPROXIMATE

City of Fortuna  
Humboldt County, California

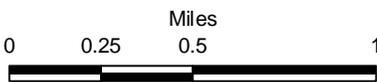
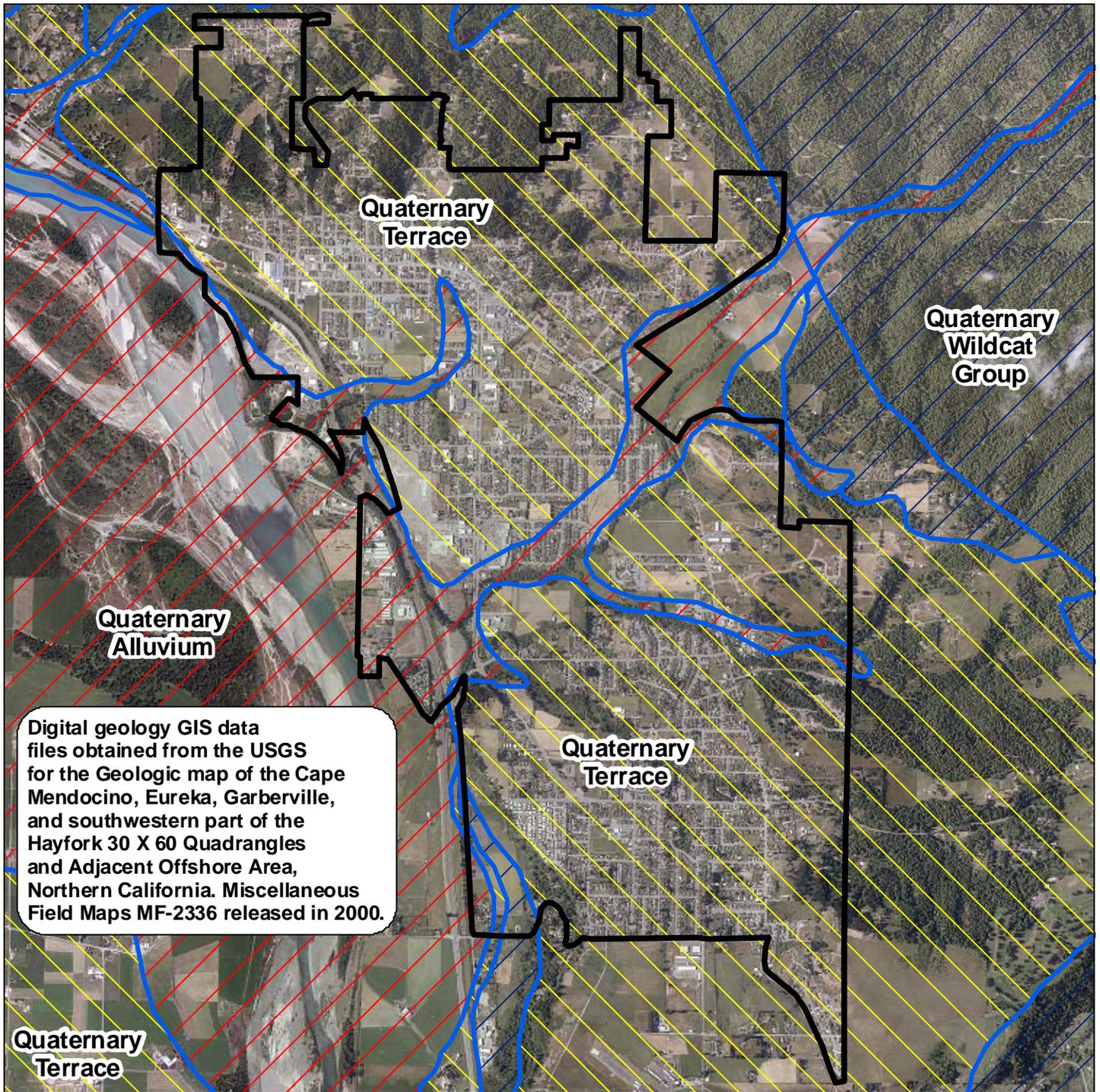
Figure 4  
Eel River Valley  
Groundwater Basin



**Freshwater Environmental Services**

Date: 5-26-11

By: SJT



**LEGEND**

 Approximate Boundary of City of Fortuna based on data obtained from Humboldt County GIS Department.

Base Image Data Source: USDA-FSA Aerial Photography Field Office Color Digital Ortho Photo Quad, Image Date June, 2010.

ALL LOCATIONS APPROXIMATE

City of Fortuna  
Humboldt County, California

Figure 5  
Geologic Map



Freshwater Environmental Services

Date: 5-26-11

By: SJT



**APPENDIX A  
NOTICE OF PREPARATION TO NEIGHBORING  
MUNICIPALITIES**

April 27, 2011

Rick Chicora, City of Rio Dell  
465 Hilltop Drive  
Rio Dell, California 95562

Re: 60-Day Notification of Review of City of Fortuna's UWMP

Gentlemen:

The City of Fortuna Public Works Department wishes to inform you that we are in the process of reviewing and revising our Urban Water Management Plan. We are informing you of this revision because we serve water within Humboldt County. The revised Urban Water Management Plan is required to be adopted by July 1, 2011, and to be submitted to the Department of Water Resources by August 1, 2011. We will be holding a public hearing on the draft revision of the Urban Water Management Plan in advance of the adoption and will send a notice of this hearing to you as the time gets nearer.

We welcome your participation in the revision of the City of Fortuna Urban Water Management Plan. Please contact me at 725-1472 if you would like to participate in the urban water management planning process or if there is another individual within your jurisdiction who should be our primary point of contact.

Sincerely,  
CITY OF FORTUNA



Dennis Ryan  
Public Works Director/City Engineer  
(707) 725-1472  
dryan@ci.fortuna.ca.us

City Hall  
(707) 725-7600  
Fax (707) 725-7610  
621 11th Street

Police Department  
(707) 725-7550  
Fax (707) 725-7574  
621 11th Street

Parks and Recreation  
(707) 725-7620  
Fax (707) 725-7576  
5 Park Street

Public Works  
(707) 725-7650  
Fax (707) 725-7651  
180 Dinsmore Drive

April 27, 2011

Ken Davis, Palmer Creek CSD  
P.O. Box 309  
Fortuna, California 95540

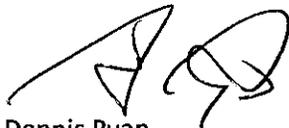
Re: 60-Day Notification of Review of City of Fortuna's UWMP

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180 Dinsmore Drive

April 27, 2011

Frank S. Bacik, Town of Scotia Company, LLC  
P.O. Box 245  
Scotia, California 95565

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180 Dinsmore Drive

April 27, 2011

Doug Culbert, City of Ferndale  
P.O. Box 1095  
Ferndale, California 95536

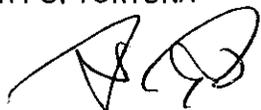
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180 Dinsmore Drive

April 27, 2011

Kirk Girard, Humboldt County Community Development Services Department  
Clark Complex  
3015 H Street  
Eureka, California 95501-4484

Re: 60-Day Notification of Review of City of Fortuna's UWMP

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**APPENDIX B  
NOTICE OF PUBLIC HEARING FROM THE LOCAL  
NEWSPAPER**

# CITY OF FORTUNA

## NOTICE OF PUBLIC HEARING

**NOTICE IS HEREBY GIVEN** of a public hearing for the purpose of receiving public comment and testimony regarding the **DRAFT City of Fortuna Urban Water Management Plan (UWMP)**. The City will hold this public meeting in compliance with requirements of the California Department of Water Resources (DWR) pursuant to the UWMP Act and the Water Conservation Bill of 2009 to solicit the input of the public regarding the UWMP, and the City's intention to adopt the Plan.

The UWMP Act (California Water Code §10610 et seq.) requires urban water suppliers to report, describe, and evaluate the following four areas:

- Water deliveries and uses;
- Water supply sources;
- Efficient water uses; and
- Demand Management Measures (DMMs), including implementation strategy and schedule.

A copy of the Draft UWMP is available at City Hall for review, and on the City's web site at [www.friendlyfortuna.com](http://www.friendlyfortuna.com).

The City of Fortuna will hold this public hearing on Monday, June 20, 2011 at 6:00 PM in the City Hall Council Chambers at 621 11<sup>th</sup> Street, Fortuna. Any and all interested parties are invited to attend and be heard at this public hearing. Further information can be obtained from the City of Fortuna, 621 11<sup>th</sup> Street, Fortuna, CA 95540 or by telephone at (707)725-7600.

/s/ Duane V. Rigge  
CITY CLERK  
CITY OF FORTUNA

**APPENDIX C**  
**BASELINE AND GOALS SPREADSHEET**

### City of Fortuna Baseline and Goals

Year	Total Production Millions of Gallons	Residential Consumption Millions of Gallons	Total Consumption Millions of Gallons	Loss Percent	Number of Residential Connections	Population	Consumptiogn per Capita Gallons/Day	Capita per Connection
1986	356.00	229	337	5.34	3199	8320	110.972	2.60
1987	364.00	235	343	5.77	3249	8375	112.206	2.58
1988	378.00	243	357	5.56	3360	8613	113.559	2.56
1989	393.00	249	371	5.60	3432	8787	115.675	2.56
1990	403.00	252	382	5.21	2826	9273	112.863	3.28
1991	381.00	229	357	6.30	3015	8967	109.076	2.97
1992	425.00	266	405	4.71	3117	9102	121.906	2.92
1993	392.00	256	392	0.00	3169	9545	112.517	3.01
1994	418.00	281	420	-0.48	3168	10086	114.087	3.18
1995	421.00	340	421	0.00	3250	10093	114.280	3.11
1996	451.00	370	451	0.00	3600	10075	122.642	2.80
1997	474.00	390	474	0.00	4201	10063	129.050	2.40
1998	460.13	380	460.2	-0.01	4225	10214	123.441	2.42
1999	476.63	398	478	-0.29	4228	10234	127.965	2.42
2000	488.20	331	489	-0.16	4358	10512	127.447	2.41
2001	512.60	348	512	0.12	4458	10637	131.874	2.39
2002	492.70	338	493	-0.06	4506	10745	125.704	2.38
2003	496.30	341	496	0.06	3685	10884	124.853	2.95
2004	519.20	366	520	-0.15	3771	11008	129.420	2.92
2005	493.80	347	493	0.16	4220	11202	120.575	2.65
2006	514.50	367	514	0.10	3874	11266	124.997	2.91
2007	504.10	371	505	-0.18	3902	11255	122.929	2.88
2008	489.00	365	489	0.00	3966	11311	118.445	2.85
2009	456.90	351	457	-0.02	3979	11356	110.255	2.85
2010	439.60	328	440	-0.09	3917	11926	101.080	3.04
2011						12081		
2012						12238		
2013						12397		
2014						12558		
2015						12722		
2016						12887		
2017						13055		
2018						13224		
2019						13396		
2020						13570		
2021						13747		
2022						13925		
2023						14106		
2024						14290		
2025						14476		
2026						14664		
2027						14854		
2028						15048		
2029						15243		
2030						15441		

Percent Population Increase	Year
	1986
0.656716418	1987
2.763264832	1988
1.98019802	1989
5.241022323	1990
-3.412512546	1991
1.483190508	1992
4.641173389	1993
5.363870712	1994
0.069354999	1995
-0.17866005	1996
-0.119248733	1997
1.478363031	1998
0.195427008	1999
2.644596651	2000
1.175143367	2001
1.00511866	2002
1.277104006	2003
1.126453488	2004
1.731833601	2005
0.568080952	2006
-0.09773434	2007
0.495093272	2008
0.396266291	2009
4.779473419	2010

10 Yr Baseline 1995-2004	Ave GPCD	Method 1 80%	Method 3 Target
125.6675			
1996-2005	126.297	101.038	123.500
1997-2006	126.5326		
1998-2007	125.9204		
1999-2008	125.4208		
2000-2009	123.6499		
2001-2010	121.0131		
			2020 Goal Adjusted Urban Water Use Target
5 Yr Baseline 2003-2007	124.555	118.32721	
2004-2008	123.2732	117.10953	
2005-2009	119.4401	113.46813	
2006-2010	115.5411	109.764	
			2015 Goal Interim Urban Water Use Target
		122.31212	

GPCD BMP Baseline  
103.7567131

**APPENDIX D**  
**DRAFT VERSION OF A WATER SHORTAGE**  
**CONTINGENCY RESOLUTION**

## DRAFT

### ORDINANCE OF THE CITY OF FORTUNA PERTAINING TO WATER SHORTAGE REGULATIONS

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF FORTUNA AS FOLLOWS:

#### WATER SHORTAGE AND WATER WASTE REGULATIONS

(A) From time to time it may be necessary that Council declare that a water shortage emergency condition prevails in the area served by the city. During such Council-declared water shortages, this subchapter is intended to allocate equitably the water available to human consumption, sanitation, and fire protection.

(B) The specific uses regulated or prohibited in this subchapter are nonessential and, if allowed, would constitute wastage of water and should be prohibited pursuant to Cal. Water Code §§ 350 et seq. and 71640 et seq. and the common law.

#### 1-DEFINITIONS.

For the purpose of this subchapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

- **CITY.** The City of Fortuna, California.
- **COUNCIL.** The elected Council of the city.
- **CUSTOMER.** Any person using water supplied by the city.
- **MANAGER.** The City Manager of the city.
- **NONESSENTIAL USE.** Any use not required for human consumption, sanitation, or fire protection.
- **NONESSENTIAL USER.** Any user other than a domestic residential customer or facility providing for health and safety.
- **OUTDOOR SURFACE.** Any patio, porch, veranda, driveway, or sidewalk.
- **PERSON.** Any person, firm, partnership, association, corporation, company, or organization of any kind.
- **WATER.** Potable water provided by the City through its distribution system.
- **WATER WASTE:**
  - Water use in outdoor areas resulting in runoff. The use of water which allows water to run off to a gutter, ditch, or drain.
  - The excessive use, loss, or escape of water through breaks, leaks or malfunctions in the water user's plumbing or distribution facilities.
  - The washing of vehicles, building exteriors, sidewalks, driveways, parking areas, tennis courts, patios or other paved areas without the use of a positive shut-off nozzle on the hose, which results in excessive run-off, except where necessary to dispose of liquids or substances that would endanger the public's health and safety.

#### 2-APPLICATION.

The provisions of this subchapter shall apply to all customers of the City using water both in and outside the city limits, regardless of whether any causing water shall have a contract for water service with the city.

### **3-LARGE WATER USERS.**

No person whose historic monthly average water use of any three-month period exceeds 50,000 gallons per month, called "large water user" in this subchapter, shall irrigate, sprinkle, or water any shrubbery, trees, lawns, grass, ground covers, plants, vines, gardens, vegetables, flowers, or any other vegetation during a declared water shortage except as assigned by the Manager after consultation with individual large water users.

### **4 SITE DESIGN REVIEW.**

(A) During a declared water shortage, no planting or landscaping required by the design review process or other city action shall be implemented unless the Manager determines that the health, safety, or welfare of the public might be endangered.

(B) Single pass cooling systems, non-recirculating systems in car washes and commercial laundry systems and non-recycling decorative water fountains are prohibited in all new water services.

### **5 WATER WASTE PROHIBITED.**

No person or customer shall cause or permit water waste as defined in Section 1.

### **6 NONESSENTIAL USES; LIMITATIONS.**

(A) *Prohibited.*

(1) Whenever the Manager determines that the water available to the city is insufficient to permit nonessential uses and that all water then available to the city should be used solely for human consumption, sanitation, and fire protection, he may order and direct, individually or collectively, that nonessential uses shall not be permitted by any person or customer. While such order is in effect, no person or customer shall fill with city-furnished water any swimming pool, wash any car or any outdoor surface, irrigate, sprinkle, or water any shrubbery, trees, lawns, grass, ground covers, plants, vines, gardens, vegetables, flowers, or any other vegetation, or allow any other nonessential use of water as designated by order of the Manager.

Violations shall be punished as set forth in ### of this chapter. (2) The Manager shall use every available means to inform customers that such order is in effect.

(B) *Limited amount of water delivered to customers.* Whenever the Manager determines the water available to the city is insufficient to meet the demands of customers of the city and that all water available to the city should be protected for human consumption, sanitation, and fire protection, he may order that limits be imposed on individual consumption as determined and specified by resolution of the Council, including penalties in addition to those set forth in ###

## **7 ENFORCEMENT.**

(A) Each police officer of the city, in connection with his duties imposed by law, shall diligently enforce the provisions of this subchapter.

(B) The Manager and all employees of the city shall have the duty and are authorized to enforce the provisions of this subchapter and shall have all the powers and authority set forth in Cal. Penal Code § 836.5, including the power to issue written notices to appear.

## **8 OPERATIVE DATES.**

(A) Section 6 shall become operative each time the Council by resolution declares that a water emergency condition prevails pursuant to Cal. Water Code, §§ 350 et seq.

(B) Section 6 shall become inoperative from the time when the Council by resolution determines that a water shortage no longer exists until the Council, if ever, subsequently declares that another water shortage prevails.

## **9 DISCONNECTION FOR VIOLATION.**

The Manager shall forthwith direct and cause the disconnection of the water service of any person or customer cited for a misdemeanor under this subchapter. Such service shall be restored only upon the payment of the turn-on charge fixed by the Council, as provided in this code.

**APPENDIX E**  
**AB 1420 SELF- CERTIFICATION STATEMENT**  
**TABLES 1 AND 2**

**AB 1420 Self-Certification Statement Table 1**

**Note: Table 1 documents Status of Past and Current BMP Implementation.**

**Self-Certification Statement:** The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory: Dennis Ryan Title of Signatory: Director of Public Works Signature of signatory:  Date: 5/23/11

**Application Date:**

Proposal Identification Number:  CUVCC Member? Yes/No  No

Has Urban Water Supplier submitted a 2006 Urban Water Management Plan? Yes/No  No Is the UWM Plan Deemed Complete by DWR? Yes/No  2000-Plan Yes

Applicant Name: City of Fortuna

**Project Title:**

Applicant's Contact Information: Name: Dennis Ryan Phone: 707-726-1472 E-mail: dryan@ci.fortuna.ca.us

Wholesaler (List Below)	Wholesaler (List Below)
<u>City of Fortuna</u>	<u>None</u>

C1	C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18	
BMPs required for Wholesaler Supplier	BMPs required for Retail Supplier	BMPs	BMP Implemented by Retailers and/or Wholesalers / BMP			Compliance Optional/Alternative Conservation Approaches (1)			BMP is Exempt (2)			BMP Implementation Requirements Met						
			Retailer Yes/No	Wholesaler Yes/No	Regional Yes/No	BMP Checklist	Flux Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer Yes/No	CUWCC MOU Requirement Met: Wholesaler Yes/No	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Date Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No		
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers	Yes							✓				Yes			July, 2011	No
	✓	BMP 2 Residential Plumbing Retrofit	Yes							✓				Yes			July, 2011	No
✓	✓	BMP 3 System Water Audits, Leak Detection	Yes				✓							No				No
✓	✓	BMP 3 Leak Repairs	Yes				✓							No				No
	✓	BMP 4 Metering with Commodity Rates for All New connections	Yes				✓							Yes			July, 2011	No
	✓	BMP 4 Retrofit of Existing Connections	Yes				✓							Yes			July, 2011	No
	✓	BMP 5 Large Landscape Conservation Programs and Incentives	Yes							✓				Yes			July, 2011	No
	✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes							✓				Yes			July, 2011	No
✓	✓	BMP 7 Public Information	Yes				✓							No				No
✓	✓	BMP 8 School Education	Yes				✓							No				No
	✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes							✓				Yes			July, 2011	No
✓		BMP 10 Wholesale Agency Assistance Programs																
	✓	BMP 11 Conservation Pricing	Yes				✓							No				No
✓	✓	BMP 12 Conservation Coordinator	Yes				✓							Yes			July, 2011	No
	✓	BMP 13 Water Waste Prohibitions	Yes				✓							No				No
	✓	BMP 14 Residential ULFT Replacement Programs	Yes							✓				Yes			July, 2011	No

\*C8: Wholesaler may also be a retailer (supplying water to end water users)  
 \*\*C8, \*\*C9, \*\*, and C10: Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: <http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx>.  
 (2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU  
 (3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

**AB 1420 Self-Certification Statement Table 2**

**Provide Schedule, Budget, and Finance Plan to Demonstrate Commitment to Implement All BMP's to Become in Compliance with BMP Implementation - Commencing Within 1st Year of Agreement for Which Applicant Receives Funds.**

**Self-Certification Statement:** The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1 and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self-Certification Statement Table 1 and Table 2, and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory: Dennis Ryan Title of Signatory: Director of Public Works Signature of signatory:  Date: 5/23/11

**Application Data:**

Proposal Identification Number:  CUIWCC Member? Yes/No  No

Applicant Name: City of Fortuna Is the UWM Plan Deemed Complete by DWR? Yes/No  Yes-2000

Project Title:

Applicant's Contact Information: Name Dennis Ryan

Participants:	City of Fortuna

C2	C3	C4	C5	*C6	C7	C8	**C9	**C10	**C11	C12	C13	C14	C15	C16	C17	C18	C19	
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	BMP Implemented by Retailers and/or Wholesalers			Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)		Implementation Scheduled to Commence within 1st Year of Agreement							
			Retailer Yes/No	Wholesaler Yes/No	Regional Yes/No	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUIWCC Coverage Yes/No
<b>1. Utility Operations Programs</b>																		
✓	✓	BMP 12 Conservation Coordinator	Yes															
✓	✓	BMP 13 Water Waste Prohibitions	Yes				Yes				Jul-11	0	1-Jul-12	\$1,000	Water Enterprise fund	yes	no	
✓	✓	BMP 10 Wholesale Agency Assistance Programs	N/A															
✓	✓	BMP 3 System Water Audits, Leak Detection/Repair	Yes				Yes				Jul-11	0	1-Jul-12	\$5,000	Water Enterprise fund	yes	no	
	✓	BMP 4 Metering with Commodity Rates for All New/Retrofit of Existing connections	Yes															
	✓	BMP 11 Conservation Pricing	Yes				Yes				Jul-11	0	1-Jul-12	\$20,000	Water Enterprise fund	yes	no	
<b>2. Educational Programs</b>																		
✓	✓	BMP 7 Public Information	Yes				Yes				Jul-11	0	1-Jul-12	\$2,500	Water Enterprise fund	yes	no	
✓	✓	BMP 8 School Education	Yes				Yes				Jul-11	0	1-Jul-12	\$2,500	Water Enterprise fund	yes	no	
<b>3. Residential</b>																		
	✓	BMP 1 Indoor Water Survey for Single/Multi-Family Residential Customers	Yes															
	✓	BMP 1 Outdoor Water Survey for Single/Multi-Family Residential Customers	Yes															
	✓	BMP 2 Residential Plumbing Retrofit	Yes															
	✓	BMP 6 High-Efficiency Washing Machine Rebate Programs	Yes															
	✓	BMP 14 Residential ULFT Replacement Programs	Yes															
<b>4. Commercial, Industrial, Institutional</b>																		
	✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts	Yes															
<b>5. Landscape</b>																		
	✓	BMP 5 Large Landscape Conservation Programs and Incentives	Yes															

\*C8: Wholesaler may also be a retailer (supplying water to end water users)  
 \*\*C9, \*\*C10, and \*\*C11: Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP #8.  
 (1) For details, please see <http://www.cuwrce.org/mcafeehabit-1-bmp-definitions-schedules-requirements.aspx>.  
 (2) BMP is exempt based on cost-effectiveness, lack of funding, or lack of legal authority, as detailed in the CUIWCC MOU.