HUMBOLDT COMMUNITY SERVICES DISTRICT
2010
URBAN WATER MANAGEMENT PLAN

Prepared for:
Humboldt Community Services District
5055 Walnut Drive
Eureka, California 95503

August 22, 2011

Prepared by:
Orrin Plocher and Stan Thiesen

of

Freshwater Environmental Services

78 Sunny Brae Center
Arcata, California 95521
Phone (707) 839-0091

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

This Urban Water Management Plan (UWMP) has been prepared for the Humboldt Community Services District (HCSD) 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.

This update was prepared and adopted during the summer of 2011. This is the fourth such plan prepared by the HCSD. The last plan was submitted in December 2000.

The data used for preparing this report comes primarily from HCSD and Humboldt Bay Municipal Water District's (HBMWD's) operational records. Figures relating to watershed runoff were obtained from the United States Geological Survey. Current and projected population figures for Humboldt County are based on data from the U.S. Census Bureau.

It should be noted that HCSD is located in a high rainfall, moderate temperature climate with abundant water supplies.

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)).

Contact was made with the City of Eureka (COE) which qualifies as an Urban Water Supplier as defined by the Urban Water Management Planning Act and the Humboldt Bay Municipal Water District (HBMWD) which is primarily a regional water wholesaler. The HCSD receives water from the COE, HBMWD and HCSD's groundwater wells. The HCSD provided assistance and information needed by these agencies in the preparation of their plans; and they reciprocated. Both entities will be provided with copies of the HCSD's adopted plan. The HCSD does not supply water to any other agencies or municipalities. The HCSD shares a common source of water from HBMWD with the City of Arcata, COE, City of Blue Lake, Fieldbrook-Glendale Community Services District, Manila Community Services District, and McKinleyville Community Services District. HCSD attended and participated in meetings hosted by HBMWD for it's customers to discuss and develop UWMPs. The municipalities that were notified of the preparation of HCSDs UWMP update are included in 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 HCSD 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 HCSD 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 HCSD's 2010 UWMP, a public hearing was held during the September 27, 2011 HCSD Board of Directors 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 HCSD'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 HCSD's 2010 UWMP, was adopted by the HCSD Board of Directors on September 27, 2011 by Resolution 2011-08 (Appendix F), and will be submitted to the DWR by October 27, 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 HCSD 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 HCSD, situated in Humboldt County and approximately 280 miles North of San Francisco, surrounds the southerly and easterly boundaries of the City of Eureka (Figure 1). The easterly region of the HCSD encompasses the unincorporated areas of Myrtletown, Mitchell Heights, Pigeon Point, and Freshwater (Figure 2). The unincorporated areas of Pine Hill, Humboldt Hill, King Salmon, Fields Landing and College of the Redwoods constitute the southern regions of the HCSD. The central region, where the HCSD office is located includes the Cutten, Ridgewood and Westgate areas of the district. The total area served by the HCSD is approximately 19 square miles.

The HCSD, a public agency, was created by election on September 23, 1952. The HCSD began operations on October 18, 1952 under the provisions of the Community Services Law of the State of California, as amended, with authority under Government Code, Section 6100 et seq. Although current services provided by the HCSD are sewer, water and street lighting services, the HCSD is chartered to additionally provide recreation, storm drainage and garbage collection.

The HCSD is primarily urban residential in nature, which makes up approximately 97% of total HCSD accounts. Water supplied to HCSDs customers consists of water supplied by HBMWD, COE, and groundwater extracted from three wells owned by the HCSD. These wells, which are up to 440 feet deep, are all located at the base of Humboldt Hill, and produce excellent quality water. These wells receive chlorination before distribution to the reservoir storage and distribution system.

Drinking water is pumped to 10 reservoirs by thirteen water booster pump stations. The 10 reservoirs have a total storage capacity of approximately 5 million gallons.

There are over 14 pressure zones, which distribute water throughout the District (Figure 3). The water reservoirs operate fourteen different pressure zones using gravity flow. The other two pressure zones are supplied hydro-pneumatically by pump stations, and are subject to shortages in the event of power outages. The District currently owns three trailer-mounted generators, of which the largest is 125 KW, to protect against water shortages in the event of a power failure. A map of the HCSD water distribution system in include as Figure 1.

The HCSD supplies water to 7,360 active connections (2010). Approximately 7,115 residential connections (6,798 single family, 317 multi-family), 234 connections are commercial, eight landscape irrigation connections, and three other connections that are used for sale of bulk water to water trucks. There are no industrial or agricultural connections. Fire protection is achieved through 426 fire hydrants.

In 2010, a total of 591.09 million gallons of water was distributed to its customer base.

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

The HCSD weather is typical of coastal Northern California, characterized by moderate temperatures, frequent fog and moderate to heavy participation. Humboldt County's watersheds receive high annual rainfall. Rainfall at Eureka averages just below 40 inches per water year (October to September). At Ruth, in Trinity County, where HBMWD operates the R.W. Matthews Dam and the Ruth Reservoir (Ruth Lake), average rainfall is just under 70 inches per water year. Some mountainous areas within the region often receive more than 100 inches of rain per year.

Climatic data for Eureka and Forest Glen is included below. The Forest Glen data has been included because it is the closest weather gathering station near the Ruth area where HBMWD's source water originates:

	Climate				
Month	Forest Glen Avg. Evapotranspiration (Inches)	Forest Glen Avg. Rainfall (Inches)	Forest Glen Avg. Temp. Min-Max (Fahrenheit)	Eureka Avg. Rainfall (Inches)	Eureka Avg. Temp (Fahrenheit)
Jan	1.9	12.5	26.4 – 45.1	6.75	54.5
Feb	2.2	9.8	29.5 – 51.5	5.35	55.5
Mar	3.7	9.2	30.7 – 56.0	5.19	55.4
Apr	4.8	4.5	32.9 – 63.5	2.97	56.3
May	5.3	1.6	37.8 – 72.9	1.65	58.6
Jun	5.7	0.6	43.3 – 82.5	0.60	60.7
Jul	5.6	0.2	46.4 – 91.4	0.13	61.8
Aug	5.3	0.4	45.3 – 90.6	0.35	63.0
Sep	4.2	1.1	41.0 – 84.4	0.77	63.0
Oct	3.4	3.4	35.5 – 70.2	2.66	61.1
Nov	2.4	9.2	31.7 – 53.3	5.68	58.0
Dec	1.9	11.4	28.3 – 45.2	7.00	54.9

The data in the above table is from the California Irrigation Management Information System (CIMIS) website http://wwwcimis.water.ca.gov.

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)).

A GIS coverage of the HCSD drinking water distribution service area was used with US Census Bureau population and housing data to determine the service area populations and housing for 2000 and 2010 as indicated below.

Year	**Population**	**Connections**	**Housing Units**	**Persons/Connection**
2000	19,016	6,856	7,886	2.77
2010	20,032	7,360	8,860	2.72

The average number of persons per service connection over the past ten years is 2.75. With this information the population of the service area was estimated for the years of 1988 through 2010.

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

The percent annual population change was calculated from 1988 through 2010. In addition, rolling 5-year average percent population change was calculated. The greatest 5-year average percent of population change in the service area was nearly a 2.5% increase from 1989 to 1994. Since 1994 the 5-year rolling average of population change has steadily decreased to 0.33% in the interval form 2005 to 2010. The population of the HCSD service area was estimated over the planning period by using a 0.33% annual population growth as indicated in Table 2.

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

The HCSD is primarily urban residential in nature, which makes up approximately 97% of total HCSD accounts. Commercial and industrial accounts make up the 3% balance and include, Humboldt Bay Forest Products, PG&E Power Plant, College of the Redwoods, and Redwood Acres Fairgrounds. The HCSD supplied water to 7,360 connections.

The customer base for the HCSD water distribution in 2010 is described in the table below:

Type of Service Connection	**Number of Service Connections**
Single-family residential	6,798
Multi-family residential	317
Commercial	234
Industrial	0
Landscape irrigation	8
Other	3
Agricultural irrigation	0
Total Connections	7,360

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)).

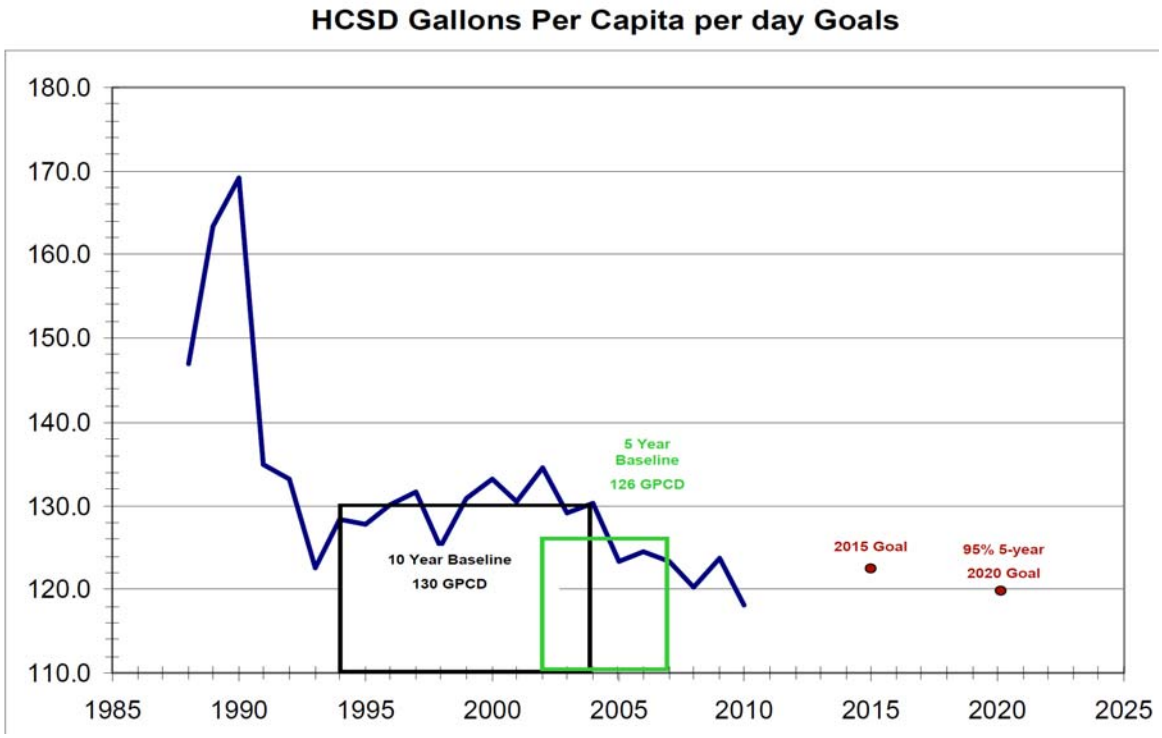
The Methodology contained in Calculating Baseline and Compliance Urban Per Capita Water Use, (California Department of Water Resources, 2011) was used to determine the target and baseline values for the HCSD (Tables 13-15). The spreadsheet used for determination of baseline and targets is included in Appendix C. The HCSD calculated individual baselines and targets. In 2008, the HCSD did not have at least 10% of its 2008 measured retail water demand met through recycled water and therefore used a 10-year baseline. Technical methodology # 1 was used to determine gross water use and Technical methodology # 2 was used to determine the services population area. The first base period (10-year continuous period) was selected from 1995 to 2004. The average gallons/capita day (GPCD) for the 10-year base period was 130 GPCD. Using Method # 3 (95% of the regional goal of 130) to calculate the 2020 GPCD goal for the District 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 126 GPCD. Since 95% of the 5-year baseline is 120 GPCD and is less than the 2020 GPCD goal using Method # 3 (123 GPCD) the adjusted 2020 GPCD goal is 120 GPCD. The interim target goal for 2015 is 123 GPCD.

Summary of GPCD Goals

10-year Base GPCD	130
80% (10-year Base GPCD)	104
North Coast Region Statewide Baseline (1995-2005)	165
North Coast Region Statewide Interim Target by 2015	151
North Coast Region Statewide Target by 2020	137
5-year Base Daily Per Capita Water Use	126
95% of 5-year Base GPCD/ adjusted 2020 Urban Water Use Target	120
HCSD's Interim (2015) Goal	**123**
HCSD's 2020 Target	**120**

The graph provided below illustrates the HCSD GPCD data, baselines and targets.



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 HCSD would sell water to any other agencies as indicated in Table 9. The HCSD is working on correcting significant leakage (33% in 2010). It is projected that HCSD will reduce their loss percent by 2% every year until the reach an anticipated baseline of 15% 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 the Humboldt County General Plan Housing Element, 2009, low income and very low income households have an income less than 80% of the median household income. Since HCSD boundaries do not correspond to city or county borders, Humboldt County data was used to determine the percent of low income households that was then applied to the HCSD service area. According to data from the 2000 census 48% of the households are classified as low and

very low income. Water use projections include projected water use for single-family and multi-family residential housing needed for lower income (Table 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)).

HCSD provided HBMWD with water use projections 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 HCSD has established a 2020 water consumption goal of 120 GPCD. Due to ongoing conservation measures the GPCD has been significantly reduced in the past 10 years from 133 GPCD in 2000 to 118 GPCD in 2010 surpassing the 2020 water consumption goal. The HCSD is committed to initiating a water survey for single/multi-family residential customers (Demand Management Measure (DMM) A), combined with residential plumbing retrofits (DMM B) and continued commitment to leak detection and correction. These additional water conservation measures should result in additional reductions beyond the 2020 GPCD goal.

SECTION 4 SYSTEM SUPPLIES

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

4.1 Water Sources

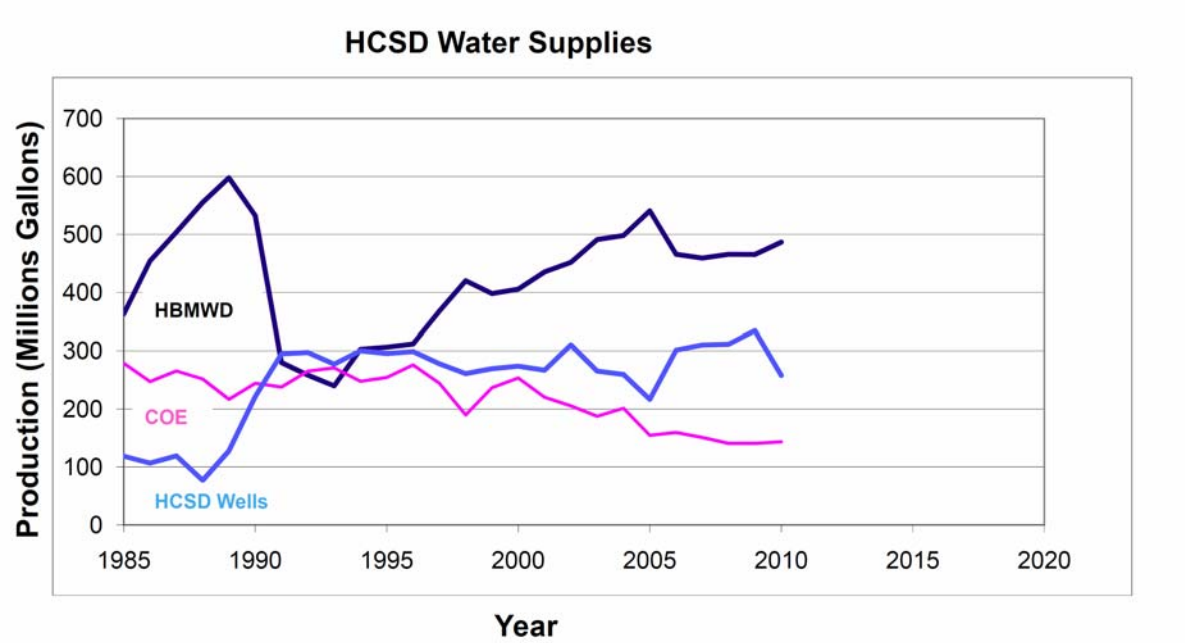
Requirement: - Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a) (10631(b)).

The HCSD acquires water from HBMWD, COE and groundwater, extracted from three District owned groundwater wells. The water received from the COE is water that the COE acquired from HBMWD.

Water originating from HBMWD comes from wells located in the bed of the Mad River. These wells, termed "Ranney Wells" because of their patented construction, draw water from the sands and gravels of the riverbed at depths ranging from 60 to 90 feet. This naturally filtered water is then disinfected by chlorination and delivered without any further treatment, to retail customers. The Department of Health Services (DOHS) classified HBMWD's water supplied to domestic customers as groundwater.

According to HBMWD documents, they currently have water rights to divert 75 million gallons per day (MGD) from the Mad River. The HBMWD also owns and operates the R.W. Matthews Dam impounding water in Ruth Lake. HBMWD manages releases from the dam to ensure sufficient supplies downstream throughout the year.

The historic volumes of water produced from the various supplies is noted in the graph below in millions of gallons per year.



In the planning period there are no plans to acquire water from any additional wholesalers or other sources as indicated in Tables 16 and 17. The maximum contracted water volumes from two wholesale suppliers is indicates in Table 17. By adding the projected HCSD groundwater well production volumes (Table 16) to the total contracted wholesale amount of water (Table 17) results in the total available water supply as indicated in Table 32.

4.2 Groundwater

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

HCSD has invested in a groundwater source to diversify our water supply and better prepare the district during emergencies. HCSD's investment in groundwater is not in response to supply limits or increased demand.

HCSD owns and maintains three deep (400 foot plus) wells. These wells are all located at the base of Humboldt Hill in the Eureka Plain Groundwater Basin, are artesian in nature, and produce excellent quality water. Groundwater pumping rights are not required as the aquifer is not adjudicated. The Eureka Plain Groundwater Basin is not over-drafted based upon extraction rates, cone of depression, recharge rate, and water surface elevation. Because of state laws requiring disinfection at the extremities of the system, these wells receive chlorination before distribution to the southern region of the HCSD. Based on groundwater depth measurements taken since 1988 (time of well installation) there has been no appreciable change in water depth. Water depth in the wells are consistent and are not influenced by climatic variation. Based on this information, the water produced from the HCSD groundwater wells is very reliable and not susceptible to drought conditions.

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)).

A Groundwater Management Plan has not been developed for the Eureka Plain Groundwater Basin.

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

Approximately 35% of HCSD drinking water is acquired from three groundwater wells that they own and operate. Groundwater from all of the wells is being produced from the Eureka Plain Groundwater Basin (Figure 4). The geology of the Eureka Plain Groundwater Basin is shown in Figure 4. The general location of the HCSD water wells is included in Figure 5.

The following sections describing the Eureka Plain Groundwater Basin is from California's Groundwater Bulletin 118, 2003 update, (State of California, Department of Water Resources, 2003):

Basin Boundaries and Hydrology

The Eureka Plain Groundwater Basin is bounded by the Little Salmon Fault to the south, Humboldt Bay and Arcata Bay to the west and northwest, and by Wildcat series deposits to the east (Strand 1962). 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 northeast basin boundary, shared with the Mad River Basin, is the northwest trending Freshwater Fault (Clarke 1990). It's unclear if the basin is hydrologically contiguous with the Mad River Basin. Humboldt Bay separates the primary basin deposits from dune sand deposits to the west. The faulted southern and northern basin boundaries may extend to the near surface and form hydrologic barriers in portions of dune sand deposits. Annual precipitation in the basin ranges from 39- to 47-inches, increasing to the southeast.

Hydrogeologic Information
The basin is composed of Quaternary alluvium and deposits of the Hookton Formation underlain by non-marine Wildcat series deposits. Surface exposures of the Carlotta Formation are also observed north of Elk River. The Carlotta Formation forms the uppermost formation of the Wildcat series (Evenson 1959).

Water-Bearing Formations
The primary water-bearing formations in the basin include the Pliocene Hookton Formation and, to a lesser extent, Holocene dune sand west of Humboldt Bay and alluvial deposits southeast of Arcata Bay and along the Elk River.

Pleistocene Hookton Formation.
The Hookton Formation underlies the alluvium in the river floodplains and is exposed surfacially over approximately 70 percent of the basin. The formation consists of yellow to yellow-brown loosely consolidated clay, silt, sand, and gravel, interfingered with blue-gray marine clay and silt. The formation is primarily fluvial in origin. In the Salmon Creek-Elk River Area, confined aquifers of the Hookton Formation yield up 800 gpm from wells about 400 feet deep (DWR 1965). Sanding of wells is a problem.

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

Groundwater Storage Capacity. Published information was not found addressing groundwater storage.

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 annual groundwater extraction for agricultural and municipal/industrial uses are 4,800 and 1,300 acre-feet (AF) respectively. Deep percolation from applied water is estimated to be 1,700 AF annually.

Groundwater Quality

Characterization. Groundwater in the basin is characterized as calcium-magnesium type water. Total dissolved solids (TDS) range from 97- to 460- mg/L, averaging 177 mg/L (DWR unpublished data).

Impairments. Groundwater impairments include localized high boron, iron, manganese, 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 HCSD 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 HCSD 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 Eureka Plain Groundwater Basin is not in critical or overdraft condition (DWR, 1975).

Efforts being undertaken to eliminate long-term overdraft conditions include groundwater level monitoring, metering groundwater pumping, and promotion of water conservation techniques through various 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 HCSD 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)).

Water desalination is cost prohibitive in the planning period. 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 HCSD's service area.

Wastewater collection is provided by HCSD in their district. Wastewater collected within the HCSD is treated at the City of Eureka wastewater treatment facility. HCSD is not responsible for treatment of wastewater or wastewater recycling. Recycled wastewater is not currently being used in the HCSD service area and given that HCSD has no authority regarding the use of recycled wastewater, none is planned as indicated in Table 23.

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)).

Wastewater collection is provided by HCSD in their district. Wastewater collected within the HCSD is treated at the City of Eureka wastewater treatment facility. The amount of wastewater collected in 2010 in the HCSD system is 476,809,720 gallons.

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)).

Wastewater collection is provided by HCSD in their district. Wastewater collected within the HCSD is treated at the City of Eureka wastewater treatment facility. HCSD is not responsible for treatment of wastewater or wastewater recycling.

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)).

Wastewater collection is provided by HCSD in their district. Wastewater collected within the HCSD is treated at the City of Eureka wastewater treatment facility. HCSD is not responsible for treatment of wastewater or wastewater recycling. Recycled wastewater is not currently being used in the CSD service area.

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)).

Wastewater collection is provided by HCSD in their district. Wastewater collected within the HCSD is treated at the City of Eureka wastewater treatment facility. HCSD is not responsible for treatment of wastewater or wastewater recycling. Recycled wastewater is not currently being used in the HCSD service area and given that HCSD has no authority regarding the use of recycled wastewater none is planned 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)).

Wastewater collection is provided by HCSD in their district. Wastewater collected within the HCSD is treated at the City of Eureka wastewater treatment facility. HCSD is not responsible for treatment of wastewater or wastewater recycling. Recycled wastewater is not currently being used in the HCSD service area and given that HCSD has no authority regarding the use of recycled wastewater, none is planned as indicated in Table 23.

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)).

Wastewater collection is provided by HCSD in their district. Wastewater collected within the HCSD is treated at the City of Eureka wastewater treatment facility. HCSD is not responsible for treatment of wastewater or wastewater recycling. Recycled wastewater is not currently being used in the HCSD service area and given that HCSD has no authority regarding the use of recycled wastewater, no actions or financial incentives are planned to encourage the use of recycled wastewater as indicated in Table 23.

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)).

Wastewater collection is provided by HCSD in their district. Wastewater collected within the HCSD is treated at the City of Eureka wastewater treatment facility. HCSD is not responsible for treatment of wastewater or wastewater recycling. Recycled wastewater is not currently being used in the HCSD service area and given that HCSD has no authority regarding the use of recycled wastewater, no actions, financial incentives, or plans are planned to encourage the use of recycled wastewater as indicated in Table 23.

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 HCSD 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 HCSD does not have any planned projects or programs to expand the water supply.

SECTION 5 WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING

The water supply reliability analysis utilized information and data from HCSD and the Humboldt Bay Municipal Water District (HBMWD), the regional water wholesaler. Water shortage contingency planning information was provided by HBMWD.

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 North Coast is one of the few areas in California with an adequate water supply. Droughts, while severe climatically, have not resulted in the level of water supply shortfalls that other areas of California routinely experience. The drought of 1976/1977 was the only declared water emergency in North Coast history. During that event, Ruth Lake storage (HBMWD water source) was 52% of normal average volume and rainfall in the Ruth Lake area was 42% of historical average. The drought came to an end with heavy rains during November 1977 (Table 27 and 28).

The HBMWD provides potable water on a wholesale basis from its domestic water system to the cities of Arcata, Eureka, and Blue Lake; and to the Humboldt, Manila, Fieldbrook - Glendale and McKinleyville Community Services Districts (CSDs). Retail water service is provided to less than 200 customers who are generally located closer to the HBMWD's distribution system than to any other municipal water service. Raw water for industrial use from its Industrial Water System is available for any future industrial customer.

Wholesale water is provided to HBMWD customers under long-term contracts. These contracts specifically assert the HBMWD's right, in accordance with the California Water Code, to suspend the water delivery requirements of the contracts if the HBMWD's Board declares that an actual or potential water shortage exists, or if all wholesale customers and the District mutually agree to implement this Water Shortage Contingency Plan. During the 1976/77 drought, which was the only declared water emergency in the history of the HBMWD, it was the policy and practice of the HBMWD to set maximum use targets for its wholesale municipal customers, allowing them to choose how to meet those targets. Since the wholesale industrial customers could not operate effectively at significantly reduced water consumption levels, they were required to repair leaks and increase the efficiency of their water use. A reservoir capacity was set at which all deliveries to the industrial customers would cease. Fortunately, capacity did not fall to that level.

This plan operates on the same principles. HCSD will retain responsibility for control of its allotments provided under the provisions of this plan. Any potential wholesale industrial customers will face the reductions outlined in each action stage. HBMWD's 200 retail customers will be treated in accordance with the action stages of this plan.

HCSD is prepared to implement the measures as adopted in Ordinance Number 77-3 by the HCSD Board of Directors (Appendix D). This Ordinance Number 77-3 is in support of the HBMWD Water Shortage Contingency Plan; if a water shortage is declared. The HCSD Board of Directors must first declare that a water emergency exists, and then implement the Contingency Plan and enforce the measures of Ordinance Number 77-3 (Appendix D).

Coordination and implementation of the Contingency Plan is assured through the activation of the HBMWD Drought Committee. This committee, established in 1977, is composed of wholesale customer representatives and the HBMWD. The committee's responsibilities include review of trigger data and input provisions regarding actual stage implementation. The HBMWD has a five stage rationing system to invoke during declared water shortages.

Plan Coordination

Coordination in implementing this Water Shortage Contingency Plan is assured through the activation of the Water Task Force. The first task force was formed in 1977. This task force would be convened as necessary to address drought conditions or other significant events which could result in a supply shortfall. It is composed of representatives of the HBMWD and each of its wholesale customers. The committee's responsibilities include:

1. Review the status of the water supply and forecasts.

2. Recommend specific actions in accordance with this plan and each entity's own water shortage plan.

3. Assure that priority of allocations meets legal requirements of consistency and non-discrimination.

4. Coordinate media releases and public announcements.

5. Coordinate interaction with regulatory agencies such as the California Departments of Water Resources, Fish and Game, and California Department of Public Health.

6. Review and make recommendations about requests for waivers from or exceptions to, actions taken pursuant to this plan.

Stages of Action

There are five defined drought action stages (Table 35). These stages may be implemented with or without a formal declaration of a water emergency by the HBMWD Board of Directors. In the event circumstances merit or require a declaration of a water shortage emergency, it is the intent of the HBMWD to rely on this plan to provide the primary framework to deal with such an emergency. The triggers attached to each stage are not intended to be absolute.

Circumstances not currently foreseeable may dictate moving to a higher action stage before the trigger levels for that stage are reached. Conversely, action stage implementation may be postponed or suspended if there is sufficient natural flow in the river to meet downstream needs. Action stages will be terminated, in consultation with the Water Task Force, as rain, runoff, and lake levels permit.

Stages and Conditions

As HBMWD, through its Water Resource Planning efforts, plans to service wholesale industrial water users in the future, the following stages and conditions assume that the HBMWD still is

operating at normal levels prior to loss of its wholesale industrial customers. Without wholesale industrial customers, triggering of these stages would not occur as quickly and there would be lower flow requirements in the river.

- **Stage 1 – Controlled Release from Storage**
  This means releasing from storage only the amount of water needed for in stream and water supply purposes.

- **Stage 2 – Optimizing Available Supply**
  Reduction of peaking by wholesale industrial customers (if there are any industrial customers), resulting in narrower production ranges and a lower flow requirement in the river.

  General voluntary water conservation measures with the municipalities, including public education efforts encouraging water conservation.

  Consideration to implement Stage 2 will be triggered when the volume in Ruth Lake falls to 65% of capacity (31,200 AF) and the accumulated rainfall in the Ruth area is 70% or less of the historical average (49 inches). Other triggers to be considered are damage to the system by flood, earthquake or other destruction; and accidental or intentional toxic spills in supply. The Water Task Force will review the trigger data and make recommendations regarding actual implementation of Stage 2.

- **Stage 3 – General Reduction**
  All wholesale and retail customers of the HBMWD will be required to reduce usage by 10% to 15% over the previous two-year average actual use. It is estimated that this will save between 2.7 MGD and 4.0 MGD, or up to 370 AF per month, based on actual usage (including previous average industrial use). Consideration to implement Stage 3 will be triggered when Ruth Lake reaches 40% of capacity (19,200 AF) and accumulated rainfall is 60% or less of historical average (42 inches). The Water Task Force will review the trigger data and provide input regarding actual implementation of Stage 3.

- **Stage 4 – Usage Allocations**
  Wholesale industrial water usage (if there were any industrial customers) will be limited to a maximum of 80% of the previous two years of actual average use. Each wholesale industrial customer will provide certification that water use is being optimized and that wasteful use of water is not occurring.

  Use allocations reflecting 16% to 30% reductions will be established for the municipalities and retail customers using the previous two years actual average usage. The specific reduction will be determined on a biweekly basis based on rate of supply reduction, weather and other relevant factors. It is estimated that this will save between 4.0 MGD and 6.6 MGD or up to 610 AF per month over current usage.

  Consideration to implement Stage 4 will be triggered when Ruth Lake reaches 30% of capacity (14,400 AF) and accumulated rainfall is 50% or less of historical average (35 inches). The Water Task Force will review the trigger data and provide input regarding actual implementation of Stage 4.

- **Stage 5 – Rationing**

  Wholesale industrial water usage (if there were any industrial customers) will be limited to the amounts required for human consumption, sanitation, and fire protection. No water will be available for industrial processes. Municipal and retail customer usage will be reduced on a basis of up to 50% as may be determined by the rate of use of available supply and weather conditions. It is estimated that this will save up to 21 MGD or 1,930 AF per month over current usage.

  Consideration to implement Stage 5 will be triggered when Ruth Lake reaches 25% of capacity (12,000 AF) and accumulated rainfall for the Ruth area continues at 50% or less of historical average (35 inches). The Water Task Force will review the trigger data and provide input regarding the actual implementation of Stage 5.

Projected Effect of Action Stages on Water Supply Reliability

A primary goal of any Water Shortage Contingency Plan is to ensure, to the greatest extent possible, that the water supply will last until it can be replenished. To examine how well this plan might achieve that goal, some supply duration analyses have been performed. These analyses compare how long the water supply in the reservoir will last both with and without implementation of the plan. The calculations assume that no rainfall or other inflows to the reservoir occur and do not take into account minimum releases required for fish and wildlife, as these vary throughout the year. These analyses also assumed that the HBMWD `was operating both its domestic and industrial systems and used a domestic water delivery of 11 MGD and an industrial water delivery of 16 MGD, totaling deliveries of 27 MGD. Flows for other water rights on the river were included; these total 1.585 MGD. Also, the calculations assumed that the action stages were put into effect as soon as the reservoir volume trigger point is reached and that the maximum reductions for each stage are implemented.

The analyses computed the number of days the supplies would last starting from the Stage 2 trigger point, which is when the lake reaches 65% of capacity (31,200 AF). If no reductions were made and the current delivery level of 27 MGD was maintained, this supply would last 352 days.

If the plan were followed as described above, the various stages would be implemented as follows:

- **Stage 2** would be implemented immediately. This stage doesn't require any reductions; deliveries would be maintained at the current level of 27 MGD.

- **Stage 3** would be reached on day 136 when the reservoir reached 40% of capacity (19,200 AF). This would lead immediately to 15% reductions to both municipal and industrial customers. This would reduce the production rate to 23 MGD.

- **Stage 4** would be reached on day 199 when the reservoir reached 30% of capacity (14,400 AF). This would lead immediately to 30% reductions in municipal deliveries and 20% reductions in industrial deliveries. This would reduce the production level to 21 MGD.

- **Stage 5** would be reached on day 235 when the reservoir reached 25% of capacity (12,000 AF). This would lead immediately to 50% reductions in municipal deliveries and reduce industrial water usage to amounts required for human consumption, sanitation, and fire protection (called 95% reduction for this analysis). This would reduce the production level to 8 MGD.

Once in Stage 5, the supplies would last another 493 days, running out on day 728.

So, in this analysis, the duration of supplies more than doubled (from 352 days to 728 days) through the implementation of this Water Shortage Contingency Plan. An increase in normal water deliveries, especially HBMWD's entry into additional wholesale contracts for industrial water, would reduce the duration of the supplies.

If the above analyses were tested with the current scenario of a normal domestic water delivery of 9.9 MGD with no industrial water delivery, the supply would last 885 days with deliveries being maintained at 11.5 MGD (including flows for other water rights in the river). Therefore, HBMWD could continue delivering water to its seven municipal customers at a steady rate for approximately 2.42 years without triggering Stage 2 of the Water Shortage Contingency Plan.

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.

In the event of a major earthquake, HCSD has steps in the HCSD Emergency Operations Plan (EOP) that detail HCSD responses. HCSD would monitor tanks, pumps, etc. through the Supervisory Control and Data Acquisition (SCADA) system. While having operators out in the field doing visual inspections of facilities. The HBMWD's Emergency Action Plan (EAP) provides response procedures for catastrophic supply interruptions involving the R.W. Matthews Dam and Reservoir (Ruth Lake) at Ruth, such as an earthquake. The HBMWD's Operations Plan (OP) provides procedures for system failures. Hazardous materials incidents are covered by numerous response plans depending on the nature of the incident.

The primary supply of water is from HBMWD. The district has invested in three deep groundwater wells that will be used in case of emergency that reduces or eliminates supplies from HBMWD.

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)).

A copy of HCSD's ordinance Number 77-3 titled "***An Ordinance Establishing Rules and Regulations for Rationing Water During a Water Shortage Emergency and Establishing Penalties for Violations Thereof.*"** is attached and includes mandatory prohibitions (Appendix D).

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

A copy of HCSD's ordinance Number 77-3 titled "***An Ordinance Establishing Rules and Regulations for Rationing Water During a Water Shortage Emergency and Establishing***

***Penalties for Violations Thereof.*"** is attached and includes penalties for excessive use (Appendix D).

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)).

HCSD has a water shortage ordinance (Appendix E) with prohibitions against specific water use practices and penalties for violations. Water consumption reduction methods from the HBMWD Water Shortage Contingency Plan implemented regionally are listed in Table 36, 37 and 38.

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)).

Reduced revenue is expected during a period of water shortage. HCSD maintains a reserve fund for such emergencies which would be used to supplement water sale revenue for short term water shortage. In the event of long term water shortage, a fee increase may be implemented to reduce reserve fund depletion and promote water conservation. All service connections are metered in the HCSD and can easily be compared to historical consumption data to determine actual reduction in water use during a period of water shortage. Tables 29 (Proposed measures to overcome revenue impacts) and Table 30 (Proposed measures to overcome expenditure impacts) are not applicable.

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

A copy of HCSD's ordinance Number 77-3 titled "An Ordinance Establishing Rules and Regulations for Rationing Water During a Water Shortage Emergency and Establishing Penalties for Violations Thereof." is attached (Appendix D).

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).

Humboldt Bay Municipal Water District

As discussed above, drinking water purchased by the District from HBMWD is drawn from wells located in the Mad River. These wells draw water from the sands and gravel of the aquifer located under the riverbed. The gravel and sands through which the water is drawn provides a natural filtration process which yields source water for the HBMWD's regional drinking water system that is of very high quality. Furthermore, the results from the HBMWD's ongoing water monitoring and testing program indicate that HBMWD's water quality is very high and meets safe drinking regulatory standards, as has consistently been the case over the years. The only water quality issue occasionally encountered by the HBMWD is turbidity. Generally, turbidity in the

Ranney Well source water is very low and meets the turbidity standards set by the California Department of Public Health (CDPH). However, during or following severe winter storm events, turbidity in the source water may rise beyond the standards set by CDPH. Turbidity itself is not a health concern. However, in the late 1990s, an extremely heavy "El Nino" rainy season caused a prolonged series of storms that raised turbidity in the source water to such a level that CDPH became concerned that it could interfere with the disinfection process, and therefore, pose a threat to public health. In 1997, CDPH directed all of the Public Water Systems in the Humboldt Bay area (the HBMWD and its wholesale municipal customers) to address the wintertime turbidity issue and to meet the turbidity standards established by CDPH. The HBMWD initiated a process with its seven municipal customers to determine the most cost effective way to meet the State's requirement. The solution was to design and construct a regional Turbidity Reduction Facility (TRF). The TRF design capacity is 14 MGD in the wintertime and 21 MGD in the summertime. The TRF was completed in April 2003 and now operates during the winter storm season to reduce higher turbidities in accordance with the State's standards. On October 10, 2003, it was named the Lloyd L. Hecathorn Turbidity Reduction Facility in honor of a long-term (24 years) HBMWD Board member. As the HBMWD's ongoing water monitoring and testing program indicates that the HBMWD's water quality has been and continues to be very high and with the turbidity issued taken care of by the TRF, the HBMWD does not foresee any current or projected water supply impact resulting from water quality (Table 30).

***Groundwater Wells (*Eureka Plain Groundwater Basin).**
Characterization. Groundwater in the basin is characterized as calcium-magnesium type water. Total dissolved solids (TDS) range from 97- to 460- milligrams per liter (mg/L), averaging 177 mg/L (DWR unpublished data).

Impairments. Groundwater impairments include localized high boron, iron, manganese, and phosphorus.

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)).

The North Coast is one of the few areas in California with an adequate water supply. Droughts, while severe climatically, have not resulted in the level of water supply shortfalls that other areas of California routinely experience. The drought of 1976/1977 was the only declared water emergency in North Coast history. During that event, Ruth Lake storage was 52% of normal average volume and rainfall in the Ruth Lake area was 42% of the historical average. The drought came to an end with heavy rains during November 1977 (Table 27).

HCSD is prepared to implement the measures outlined in the HBMWD Water Shortage Contingency Plan, if a water shortage is declared. Coordination and implementation of the Contingency Plan is assured through the activation of the HBMWD Drought Committee. This committee, established in 1977, is composed of wholesale customer representatives and HBWMD. The committee's responsibilities include review of trigger data and input provisions regarding actual stage implementation. HBMWD has a five stage rationing system to invoke during declared water shortages.

Normal Water Year

During the normal water year, the Ruth Lake area averages 69.8 inches of rainfall. 173,000 AF of water flow into the HBMWD's reservoir (Ruth Lake) via the Mad River, and the runoff from the Mad River watershed above the HBMWD's diversion facilities near Arcata is over 1,000,000 AF.

Single Dry Water Year

According to HBMWD, the water year between October of 1976 and September of 1977 was the driest year recorded by HBMWD, far drier than any other. Rainfall in the Ruth area was 29 inches, or 41% of normal. Flows into the reservoir totaled 26,000 AF or 15% of normal and the runoff from the Mad River watershed above the HBMWD's diversion facilities was 165,000 AF or 16% of normal. The average reservoir volume for the water year was 21,000 AF, which is 44% of capacity and 52% of the normal average volume. The reservoir was drawn to 27% of its capacity at the end of the water year. Fall storms arrived in November of 1977 and quickly filled the reservoir.

This water year was severely dry throughout the entire State of California, and was a very exceptional year in the HBMWD's history. In 32 years of record keeping, it was the only year in which rainfall was less than 50% of normal. It was also the only year in which the reservoir was never filled to capacity. Total flows into the reservoir via the Mad River were half the amounts of the next driest year. Runoff from the watershed and average reservoir volume were each 60% of the next driest year.

Multiple Dry Water Years

According to HBMWD records, the three water years between October 1989 and September 1992 represent the driest multiple years recorded for HBMWD. Rainfall for this period averaged 42 inches per year, which was 60% of normal. Of those three water years, the driest year for rainfall was water year 1990/1991 with 37 inches (53% of normal).

Flows into Ruth Lake via the Mad River averaged 69,000 AF per year, 40% of normal. The runoff from the Mad River watershed above the HCSD's diversion facilities was 371,000 AF, or 37% of normal. Despite the diminished rainfall and runoff, rainfall was more than sufficient to refill the reservoir each year. Reservoir capacity during this period averaged 77% of capacity, or 91% of normal.

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)).

Step One: Stages of Action

In general, the water shortage contingency plan is a five stage rationing system based on the percent capacity of the Ruth Lake storage reservoir. The Ruth Lake reservoir is the only storage reservoir for HBMWD. The contingency plan was delivered using 1976/77 as the worst case on record. During that year the Mad River runoff totaled 25% of average, rainfall in the Ruth Lake reservoir basin was 45% of the historical average and Ruth Lake was at its lowest drawdown in history - 23% of total volume.

In summary, the five stage water shortage contingency rationing is implemented as follows:

Stage 1 – Controlled Release from Storage

Is in effect at all times to assure best use of water in storage.

Stage 2 – Optimizing Available Supply

Triggered when the storage reservoir reaches between 60% and 55% of capacity, and Ruth area rainfall is 70% or less of historical rainfall. This stage may also be triggered by natural disaster or supply contamination and implements voluntary water conservation.

Stage 3 – General Reduction

All wholesale and retail customers will be required to reduce usage by 10% to 15% over the previous two-year average. Consideration to trigger Stage III when Ruth Lake reaches 40% of capacity and rainfall is 60% or less of historical average.

Stage 4 – Usage Allocations

All wholesale and retail customers will be required to reduce usage by 16% to 30% over the previous two-year average. Consideration to trigger Stage IV when Ruth Lake reaches 30% of capacity and rainfall is 50% or less of historical average.

Stage 5 – Rationing

All wholesale and retail customers will be required to reduce usage up to 50% as may be determined by the rate of use of available supply and weather conditions. Consideration to trigger Stage V when Ruth Lake reaches 25% of capacity and rainfall continues at 50% or less of historical average.

Requirement: - An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historical sequence for the agency's water supply (10632(b)).

HBMWD

HBMWD performed the analysis of their water supply reliability which is included in Appendix E. HBMWD provided data estimated from the three multiple dry years, 1989/90 through 1991/92. During that time frame, the HBMWD still had its entire permitted supply of 84,000 AFY (75 MGD) available for each of the three years. The minimum source water supply volumes for the consecutive three years would still be 84,000 AFY as presented Appendix E. The conclusion of the analysis is that HBMWD will have enough water supply to meet its contractual obligations even in a three year drought scenario. HCSD analyzed the reliability of their water supply by assuming that they will be able to receive their full contracted amount even in a three year drought scenario. The full contracted amount of water is indicated in Table 17.

HCSD's groundwater wells

Based on groundwater depth measurements taken since 1988 (time of well installation) there has been no appreciable changes in water depth. Water depths in the wells are consistent and are not influenced by climatic variation. Based on this information, the water produced from the HCSD groundwater wells is very reliable and not susceptible to drought conditions.

The reliability analysis performed by HCSD includes the assumption that it will be able to receive it's full contractual daily volume even during drought conditions as demonstrated by

HBMWD (Appendix E), and that the water produced from HCSD's groundwater wells is unaffected by drought conditions. The above water supply reliability approach is presented in Tables 32-34 which indicate that even in the modeled drought scenario, HCSD will have an access of water greater than 50% of the projected supply.

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 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)).

The reliability analysis performed by HCSD includes the assumption that it will be able to receive it's full contractual daily volume even during drought conditions as demonstrated by HBMWD (Appendix E), and that the water produced from HCSD's groundwater wells is unaffected by drought conditions. The above water supply reliability approach is presented in Tables 32-34 which indicate that even in the modeled drought scenario HCSD will have excess water greater than 100% of the projected demand.

SECTION 6 DEMAND MANAGEMENT MEASURES

6.1 Demand Management Measures (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)).

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

There are two types of water survey programs. The first type is a relatively simple, low-cost checklist designed for customers to use by themselves. The second type of water survey program, while more thorough, is expensive, requires certified auditors to conduct the survey, and poses a risk of liability to the District. The District has opted to design a checklist for customers to use in evaluating their potential water savings. The program will include a residential plumbing retrofit component that fulfills the requirements of DMM B. In the 2012/2013 fiscal year the District will research options for development of a water survey program either by District staff or in collaboration with neighboring municipalities. Program development will include creation of a checklist and informational literature and retrofit plumbing kits. Retrofit kits may include faucet aerators, low-flow shower heads, and toilet displacement devices.

Implementation costs for a water survey program could be kept to a minimum if funding for the program is provided by the District. In addition to funds, resources needed to implement this DMM include personnel to manage the program; creation of a checklist and informational literature and program advertisement. Major costs for this program are expected to be for the costs associated with the plumbing retrofit kits, cost is dependent on appliances included in kit. To keep cost down “custom kits” may be distributed to residents based on the results of their survey.

DMM B - Residential Plumbing Retrofit
The District plans on implementing this DMM in conjunction with DMM A –Water Survey Program for Residential Customers. See DMM A for details. Additionally the HCSD conforms to the Uniform Plumbing Code and State of California water conservation policy. These conservation measures only allow the purchase of low flush toilets in the State. Appliances, such as washers, are similarly designated by water consumption, emphasizing low water and low energy use appliances.

DMM C - System Water Audits, Leak Detection
HCSD has meters on all services and sources. Due to the water distribution system’s age and area seismic activities, the HCSD routinely monitors for leaks, conducts distribution system repair and meter calibration activities. Totalizers connected to the HCSD’s control system measure and record production rates, receiving rates, as well as delivery rates. These readings are taken continuously and are monitored at all times by HCSD staff. The HCSD also conducts valve exercising annually to ensure that all valving works properly and therefore allows for a distribution system check. The largest and most costly water conservation measure implemented by the HCSD Capital Improvement Program is replacement of approximately 15 miles of wrapped steel gas pipe that was used as water pipe during the 1950's. This wrapped steel pipe has a thin wall thickness, was not generally corrosion protected and is the source of most water leakage in the HCSD. Reducing system water loss is the only construction measure that HCSD intends to (continually) implement. HCSD will measure the effectiveness of this DMM by ongoing monitoring of system loss.

During 2011-2012 HCSD will utilize (AWWA) leak audit software to assist in leak detection. Based on the results HCSD will hire a leak detection contractor to do a detailed leak study of specific portions of the HCSD water distribution system.

DMM D - Metering with Commodity Rates for All New connections
The HCSD is metered for all customer sectors including separate meters for single-family residential, commercial, industrial and educational facilities. All customers are on meters and are billed by volume used. Total water sales can easily be compared to determine if the increased water fee impacted overall water use and promoted water conservation.

DMM E - Large Landscape Conservation Programs and Incentives
The HCSD service area does not include large landscape areas that rely on municipal water for irrigation purposes. Large landscape conservation programs and cost incentives would be negligible.

DMM F - High-Efficiency Washing Machine Rebate Programs
The benefits of such a program would be negligible and greatly outweighed by the cost of its implementation by HCSD. The State already requires all new appliances to be water and energy efficient.

DMM G - Public Information
The HCSD supports initiatives to inform the public about water conservation. As a retail customer of HBMWD, indirect contributions are made regularly to the California Water Awareness Campaign and the Water Education Foundation (WEF). As part of the WEF's Water Awareness Month, HBMWD has co-sponsored radio public service announcements with water awareness and water conservation messages. In the future, HBMWD will continue these efforts to raise public awareness of water conservation issues in a similar manner.

DMM H - School Education
Through the HBMWD wholesaler, education materials were purchased and donated to the Humboldt County Office of Education for use in schools throughout the county.

DMM I - Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts
The HCSD has very few water intensive commercial accounts. The PG&E Power Plant and College of the Redwoods are the two largest consumers. Landscapes only require irrigation (if at all) during the four summer months, with abundant rainfall available during fall, spring and winter.

DMM J - Wholesale Agency Assistance Programs
Since the HCSD is not a wholesale agency they are not required to comply with this DMM.

DMM K - Conservation Pricing
The HCSD's water billing pricing structure consists of a service charge for water availability (base charge) and quantity use charges (consumption choice). There is no lifeline or inclining use (tiered) charges associated with HCSD's pricing structure at this time. It is unknown if tiered meter pricing complies with Proposition 219, which requires an associated benefit to the tiered price proposed. The HCSD is a small District that has abundant water supplies and relies on water rate revenues to operate. Implementing conservation measures would reduce operating revenue (other than leak reduction).

DMM L - Conservation Coordinator
The District Planner has been assigned as the District Conservation Coordinator and has overall responsibility for oversight and implementation of the water conservation program(s).

DMM M - Water Waste Prohibitions
The HCSD has an Ordinance that prohibits the waste of water. Section 4.05.090 of the HCSD Code states "*No customer shall knowingly permit leaks or waste of water. Where water is wastefully or negligently used on a customer's premises, seriously affecting the general service, the HCSD may discontinue the service if such conditions are not corrected within five days after giving customer written notice"*. Furthermore, the HCSD has a program designed to alert customers when excessive water use is detected. This is designed to help customers detect leaks and keep water costs down to end users.

DMM N - Residential Ultra Low-Flow Toilet (ULFT) Replacement Programs
Currently all residential plumbing must comply with the Uniform Plumbing Code for new construction and rehabilitation. Given the revised plumbing code allows for only 1.6 gallons/flush toilet models to be purchased, the natural turnover in the range of 3-4% per year would eventually replace all of the older high water use models.

SECTION 7 REFERENCES

California Department of Water Resources. 1965. North Central Hydrographic Area, Volume 1; Southern Portion. Bulletin 142-1.

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

California, Department of Water Resources, 2003, California's Groundwater Bulletin 118, 2003 update.

State of California, Department of Water Resources, 1980: Ground Water Basins in California Bulletin 118-80.

State of California, Department of Water Resources, 2004: California's Groundwater Bulletin 118, 2004 update.

Clarke, Samuel H. Jr. 1990. Map Showing Geologic Structures of the Northern California Continental Margin. United States Geological Survey.

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

Strand, 1962. 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[1,2]	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
City of Arcata	P		P	P		P	
City of Eureka	P		P			P	
Humboldt Bay MWD	P		P	P		P	
McKinleyville CSD	P		P	P		P	
County of Humboldt				P		P	
Dept. Water Resources				P			

[1] *Indicate the specific name of the agency with which coordination or outreach occurred.*

[2] *Check at least one box in each row.*

Table 2

Population — current and projected

	2010	2015	2020	2025	2030	2035 - optional	Data source[2]
Service area population[1]	20,032	20,576	20,918	21,265	21,619		US Census

[1] *Service area population is defined as the population served by the distribution system.*

[2] *Source of the population data - US Census, GIS calculated for HCSD service area.*

Census data with average annual population growth of 0.33 % (5-year average population growth for the year ending in 2010).

Table 3
Water deliveries — actual, 2005

	2005				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	6,663	484.44			484
Multi-family	332	82.63			83
Commercial	233	104.22			104
Industrial					0
Institutional/governmental	Included in commercial				0
Landscape	4	1.61			2
Agriculture					0
Other	4	1.32	3		1
Total	7,236	674	3	0	674

Units: million gallons per year

Table 4
Water deliveries — actual, 2010

	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	6,798	448.74			449
Multi-family	317	66.23			66
Commercial	234	73.20			73
Industrial					0
Institutional/governmental	Included in commercial				0
Landscape	8	2.28			2
Agriculture					0
Other	3	0.63	12		1
Total	7,360	591	12	0	591

Units: million gallons per year

Table 5
Water deliveries — projected, 2015

	2015				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	6,911	456			456
Multi-family	322	67			67
Commercial	238	74			74
Industrial					0
Institutional/governmental	Included in commercial				0
Landscape	8	2			2
Agriculture					0
Other	3		6		0
Total	7,482	600	6	0	600

Units: million gallons per year

Volume and connestions projected based on 0.33% increase per year.

Table 6
Water deliveries — projected, 2020

	2020				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	7,026	464			464
Multi-family	328	68			68
Commercial	242	76			76
Industrial					0
Institutional/governmental	Included in commercial				0
Landscape	8	2.36			2
Agriculture					0
Other	2	0.65	0		1
Total	7,606	611	0	0	611

Units: million gallons per year

Volume and connestions projected based on 0.33% increase per year.

Table 7 Water deliveries — projected 2025, 2030, and 2035						
	2025		2030		2035 - optional	
	metered		metered		metered	
Water use sectors	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume
Single family	**7,142**	**471**	**7,261**	**479**		
Multi-family	**333**	**70**	**339**	**71**		
Commercial	**246**	**77**	**250**	**78**		
Industrial						
Institutional/governmental	**Included in commercial**					
Landscape	**8**	**2.40**	**9**	**2.44**		
Agriculture						
Other	**3**	**0.66**	**3**	**0.68**		
Total	**7,732**	**621**	**7,862**	**631**	**0**	**0**

Units: million gallons per year

Volume and connestions projected based on 0.33% increase per year.

Table 8 Low-income projected water demands					
Low Income Water Demands[1]	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
Single-family residential	**219**	**223**	**226**	**230**	
Multi-family residential	**32**	**33**	**34**	**34**	
Total	**251**	**255**	**260**	**264**	**0**

Units: million gallons per year

[1] Provide demands either as directly estimated values or as a percent of demand.

2000 US Census, Humboldt County household income data (48% low and very-low income).

Table 9 Sales to other water agencies							
Water distributed	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
name of agency	NA	NA	NA	NA	NA	NA	NA
name of agency	NA	NA	NA	NA	NA	NA	NA
name of agency	NA	NA	NA	NA	NA	NA	NA
Total	0	0	0	0	0	0	0

Units: million gallons per year

Table 10
Additional water uses and losses

Water use[1]	2005	2010	2015	2020	2025	2030	2035 -opt
Saline barriers							
Groundwater recharge							
Conjunctive use							
Raw water							
Recycled water							
System losses	238	297	141	92	93	95	
Total	238	297	141	92	93	95	0

Units: million gallons per year

Assumes annual loss reduction of 2% through 2020 and 15% annual loss for 2020 through 2030.

[1] *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)	674	591	600	611	621	631	
Sales to other water agencies (from Table 9)							
Additional water uses and losses (from Table 10)	238	297	141	92	93	95	
Total	912	888	741	703	714	726	0

Units: million gallons per year

Table 12
Retail agency demand projections provided to wholesale suppliers

Wholesaler	Contracted Volume [2]	Peak Rate Allocation (MGD)	2010	2015	2020	2025	2030
Humboldt Bay Municipal Water District	NA	2.9 MGD	888	933	980	1031	1083
NA							
NA							

Table 13 Base period ranges			
Base	**Parameter**	**Value**	**Units**
10- to 15-year base period	2008 total water deliveries	**918**	*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[1]	**10**	years
	Year beginning base period range	**1/1/1995**	
	Year ending base period range[2]	**12/31/2004**	
5-year base period	Number of years in base period	**5**	years
	Year beginning base period range	**2003**	
	Year ending base period range[3]	**12/31/2007**	

Units: million gallons per year

[1] *If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.*

[2] The ending year must be between December 31, 2004 and December 31, 2010.

[3] 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**	**Daily system gross water use**	**Annual daily per capita water use**
Sequence Year	**Calendar Year**			
Year 1	**1995**	**17793**	**2.32**	**128**
Year 2	**1996**	**17980**	**2.38**	**130**
Year 3	**1997**	**18208**	**2.44**	**132**
Year 4	**1998**	**18428**	**2.35**	**125**
Year 5	**1999**	**18579**	**2.48**	**131**
Year 6	**2000**	**18854**	**2.56**	**133**
Year 7	**2001**	**19022**	**2.53**	**130**
Year 8	**2002**	**19338**	**2.65**	**135**
Year 9	**2003**	**19495**	**2.56**	**129**
Year 10	**2004**	**19643**	**2.61**	**130**
			Base Daily Per Capita Water Use[1]	**130**

[1] *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**	**Daily system gross water use**	**Annual daily per capita water use**
Sequence Year	**Calendar Year**			
Year 1	**2003**	**19495**	**2.562**	**129**
Year 2	**2004**	**19643**	**2.605**	**130**
Year 3	**2005**	**19899**	**2.499**	**123**
Year 4	**2006**	**20023**	**2.538**	**125**
Year 5	**2007**	**20081**	**2.521**	**123**
			Base Daily Per Capita Water Use [1]	**126**

[1] *Add the values in the column and divid 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[1]:	**Wholesaler supplied**						
Humbold Bay Municipal Water District	**No**	**302.0**	**343.0**	**243.0**	**250.0**	**258.0**	
City of Eureka	**No**	**275.3**	**141.0**	**209.0**	**209.0**	**209.0**	
HCSD Groundwater Wells		**310.8**	**285.0**	**251.0**	**255.0**	**259.0**	
Transfers in							
Exchanges In							
Recycled Water							
Desalinated Water							
Other							
Other							
Total		**888**	**769**	**703**	**714**	**726**	**0**

Units: million gallons per year

[1] *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.*

[2] *Volumes shown here should be consistent with Tables 17 and 18.*

Table 17

Wholesale supplies — existing and planned sources of water

Wholesale sources[1,2]	Contracted Volume[3]	2015	2020	2025	2030	2035 - opt
Humboldt Bay Municipal Water District	**2.9 MGD**	**1,058.5**	**1,058.5**	**1,058.5**	**1,058.5**	
City of Eureka	**0.5 MGD**	**182.5**	**182.5**	**182.5**	**182.5**	
NA	0	0	0	0	0	0
Total Contracted Volume		**1,241.0**	**1,241.0**	**1,241.0**	**1,241.0**	

Units: million gallons per year

[1] *Water volumes presented here should be accounted for in Table 16.*

[2] *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.*

[3] *Indicate the full amount of water*

Table 18 Groundwater — volume pumped						
Basin name(s)	**Metered or Unmetered[1]**	**2006**	**2007**	**2008**	**2009**	**2010**
Eureka Plain Groundwater Basin	**Metered**	**301.10**	**310.30**	**311.40**	**334.50**	**257.80**
Total groundwater pumped		**301.10**	**310.30**	**311.40**	**334.50**	**257.80**
Groundwater as a percent of total water supply		**33%**	**34%**	**34%**	**36%**	**29%**

Units: million gallons per year

[1] Indicate whether volume is based on volumeteric meter data or another method

Table 19 Groundwater — volume projected to be pumped					
Basin name(s)	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
Eureka Plain Groundwater Basin	**285**	**251**	**255**	**259**	
Total groundwater pumped	**285**	**251**	**255**	**259**	
Percent of total water supply	**37%**	**36%**	**36%**	**36%**	

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
Total			

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	NA	NA	NA	NA	NA	NA	NA
Volume that meets recycled water standard	NA	NA	NA	NA	NA	NA	NA

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
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA
		Total	0	0	0	0	0	0

Units: million gallons per year

Table 23
Recycled water — potential future use

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

Units: million gallons per year

[1] *Technical and economic feasibility.*

[2] Includes parks, schools, cemeteries, churches, residential, or other public facilities)

[3] *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[1]	
Agricultural irrigation	NA	NA	NA	NA
Landscape irrigation[2]	NA	NA	NA	NA
Commercial irrigation[3]	NA	NA	NA	NA
Golf course irrigation	NA	NA	NA	NA
Wildlife habitat	NA	NA	NA	NA
Wetlands	NA	NA	NA	NA
Industrial reuse	NA	NA	NA	NA
Groundwater recharge	NA	NA	NA	NA
Seawater barrier	NA	NA	NA	NA
Getothermal/Energy	NA	NA	NA	NA
Indirect potable reuse	NA	NA	NA	NA
Other (user type)	NA	NA	NA	NA
Other (user type)	NA	NA	NA	NA
Total		0		0

Units: million gallons per year

[1]From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing catagories or modified to the new catagories, at the discretion of the water supplier.

[2] Includes parks, schools, cemeteries, churches, residential, or other public facilities)

[3] 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)	NA	NA	NA	NA	NA	NA
name of action (none currently, none planned)	NA	NA	NA	NA	NA	NA
name of action (none currently, none planned)	NA	NA	NA	NA	NA	NA
Total	0	0	0	0	0	0

Units: million gallons per year

Table 26
Future water supply projects

Project name[1]	Projected start date	Projected completion date	Potential project constraints[2]	Normal-year supply[3]	Single-dry year supply[3]	Multiple-dry year first year supply[3]	Multiple-dry year second year supply[3]	Multiple-dry year third year supply[3]
No projects needed or planned.								
Total			0	0	0	0	0	0

Units: million gallons per year

[1] Water volumes presented here should be accounted for in Table 16.

[2] Indicate whether project is likely to happen and what constraints, if any, exist for project implementation.

[3]Provide estimated supply benefits, if available.

Table 27 Basis of water year data	
Water Year Type	**Base Year(s)**
Average Water Year	**1989**
Single-Dry Water Year	**1977**
Multiple-Dry Water Years	**1990, 1991, 1992**

Table 28 Supply reliability — historic conditions					
Average / Normal Water Year	**Single Dry Water Year**	**Multiple Dry Water Years**			
		1990	**1991**	**1992**	
320,065	**35,540**	**186,259**	**120,958**	**92,115**	
Percent of Average/Normal Year:	**11%**	**58%**	**38%**	**29%**	

Table 29 Factors resulting in inconsistency of supply							
Water supply sources [1]	**Specific source name, if any**	**Limitation quantification**	**Legal**	**Environmental**	**Water quality**	**Climatic**	**Additional information**
Humboldt Bay Municipal Water District	**Ruth Reserevoir**	**27362**	**0**	**0**	**0**	**0**	
Ground Water	**Eureka Plain Groundwater Basin**	**NA**	**0**	**0**	**0**	**0**	

Units: million gallons per year

[1] *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
Mad River Storage and Diversions	Good	0	0	0	0	0	
Ground Water Eureka Plain Groundwater Basin	Good	0	0	0	0	0	

Units: million gallons per year

Table 31
Supply reliability — current water sources

Water supply sources [1]	Average / Normal Water Year Supply [2]	Multiple Dry Water Year Supply [2]		
		Year 2011	Year 2012	Year 2013
Mad River Storage and Diversions	320,065	186,259	120,958	92,115
Percent of normal year:	100.0%	58.2%	37.8%	28.8%

Units: million gallons per year

[1] From Table 16.

[2] *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 and 17)	1,526	1,492	1,496	1,500	
Demand totals (From Table 11)	741	703	714	726	
Difference	785	789	782	774	
Difference as % of Supply	51.4%	52.9%	52.3%	51.6%	
Difference as % of Demand	105.9%	112.3%	109.5%	106.7%	

Units: million gallons per year

Table 33
Supply and demand comparison — single dry year

	2015	2020	2025	2030	2035 - opt
Supply totals [1,2]	1,526	1,492	1,496	1,500	
Demand totals [2,3,4]	741	703	714	726	
Difference	785	789	782	774	
Difference as % of Supply	51.4%	52.9%	52.3%	51.6%	
Difference as % of Demand	105.9%	112.3%	109.5%	106.7%	

Units: million gallons per year

[1] 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.

[2] *Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.*

[3] *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.*

[4] *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** [1,2]	1,526	1,492	1,496	1,500	
	Demand totals [2,3,4]	741	703	714	726	
	Difference	785	789	782	774	
	Difference as % of Supply	51.4%	52.9%	52.3%	51.6%	
	Difference as % of Demand	105.9%	112.3%	109.5%	106.7%	
Multiple-dry year second year supply	**Supply totals** [1,2]	1,526	1,492	1,496	1,500	
	Demand totals [2,3,4]	741	703	714	726	
	Difference	785	789	782	774	
	Difference as % of Supply	51.4%	52.9%	52.3%	51.6%	
	Difference as % of Demand	105.9%	112.3%	109.5%	106.7%	
Multiple-dry year third year supply	**Supply totals** [1,2]	1,526	1,492	1,496	1,500	
	Demand totals [2,3,4]	741	703	714	726	
	Difference	785	789	782	774	
	Difference as % of Supply	51.4%	52.9%	52.3%	51.6%	
	Difference as % of Demand	105.9%	112.3%	109.5%	106.7%	

Units: million gallons per year

[1] *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*

[2] *Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.*

[3] *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.*

[4] *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. [1]	Water Supply Conditions	% Shortage
Stage No. 1	**Controlled Release from Storage**	
Stage No. 2	**Optimized Available Supply**	
Stage No. 3	**General Reductions**	**10% to 15%**
Stage No. 4	**Use Allocation**	**16% to 30%**
Stage No. 5	**Rationing**	**50%**

[1] *One of the stages of action must be designed to address a 50 percent reduction in water supply.*

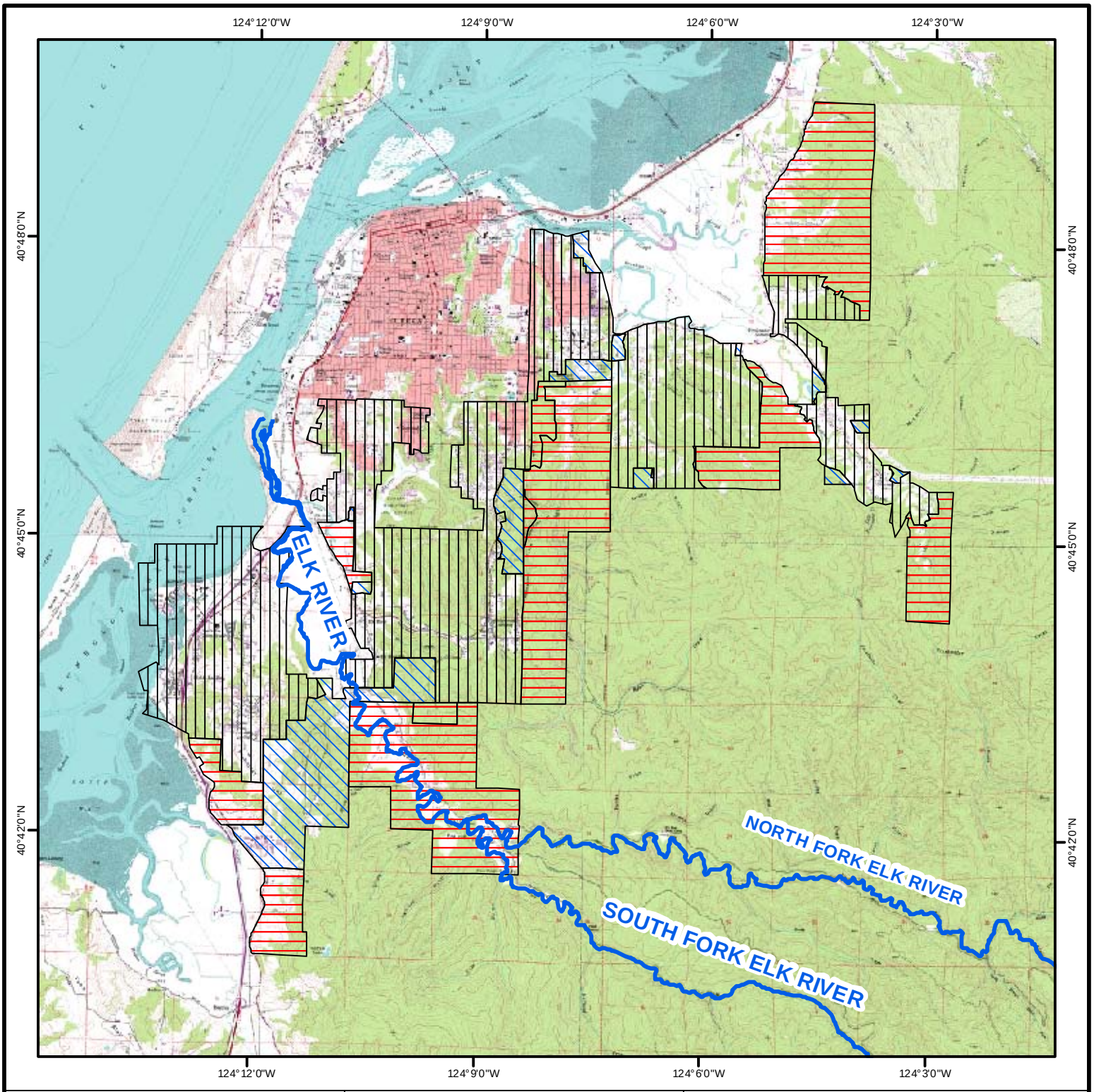
Table 36
Water shortage contingency — mandatory prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Maximim Usage (peaking) by wholesale customers.	**2**
Wholesale industrial water usage more than 80% of previous two years of average	**4**
Wholesale industrial water usage other than amounts required for human	**5**
Wholeasle and retail customer usage more that 50% of previous two years of actual	**5**

Table 37 Water shortage contingency — consumption reduction methods		
Consumption	**Stage When**	**Projected Reduction (%)**
Release from storage only amount of water needed for in- stream and water supply purposes.	1	
General voluntary water conservation measures with wholesale customers.	2	
Public education efforts encouraging water conservation.	2	
Require all wholesale and retail customers to reduce usage.	3	10% to 15%
Require all wholesale and retail customers to reduce usage further.	4	16% to 30%
No water for industrial processes and reduce wholesale and retail customer usage up to 50%.	5	50%

Table 38 Water shortage contingency — penalties and charges		
Penalties or Charges[1]	**Stage When Penalty Takes Effect**	
First violation, Infraction, $10	At time of declaration of a water emergency	
Second violation, Infraction, $30	At time of declaration of a water emergency	
Third violation and subsuquent violations within 6 month period, Misdemeaner, $100	At time of declaration of a water emergency	
[1] *From HCSD Ordinace Number 77-3*		

FIGURES



N
W E
S

Miles
0 0.5 1 2 3

LEGEND

- Approximate Boundary of HCSD
- Approximate Boundary of HCSD Sphere
- Approximate Boundary of HCSD Proposed Sphere

Boundaries obtained from Humbolldt County GIS Department.
Base Image Data Source:
1:24,000 Digital Raster Graph Mosaic of Humboldt County, California.
ALL LOCATIONS APPROXIMATE

Humboldt Community Services District

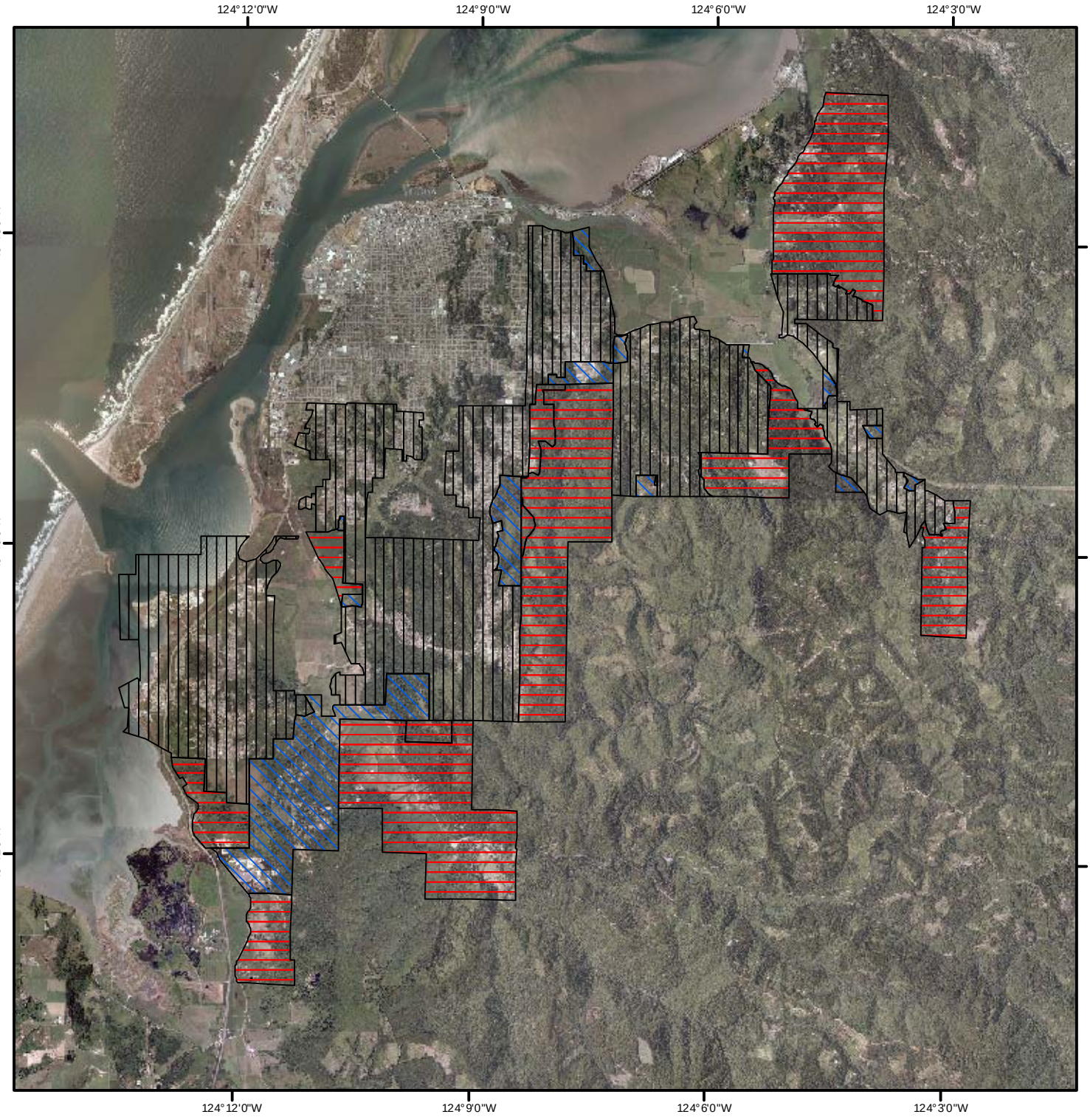
Figure 1

Site Location Map
Eureka Area, California

Freshwater Environmental Services

Date: 7-25-11

By: SJT



N
W E
S

Miles
0 0.5 1 2 3

LEGEND

- Approximate Boundary of HCSD
- Approximate Boundary of HCSD Sphere
- Approximate Boundary of HCSD Proposed Sphere

Boundaries obtained from Humbolldt County GIS Department.
Base Image Data Source:USDA-FSA Aerial Photography Field Office Color Digital Ortho Photo Quad dated June, 2010.
ALL LOCATIONS APPROXIMATE

Humboldt Community Services District

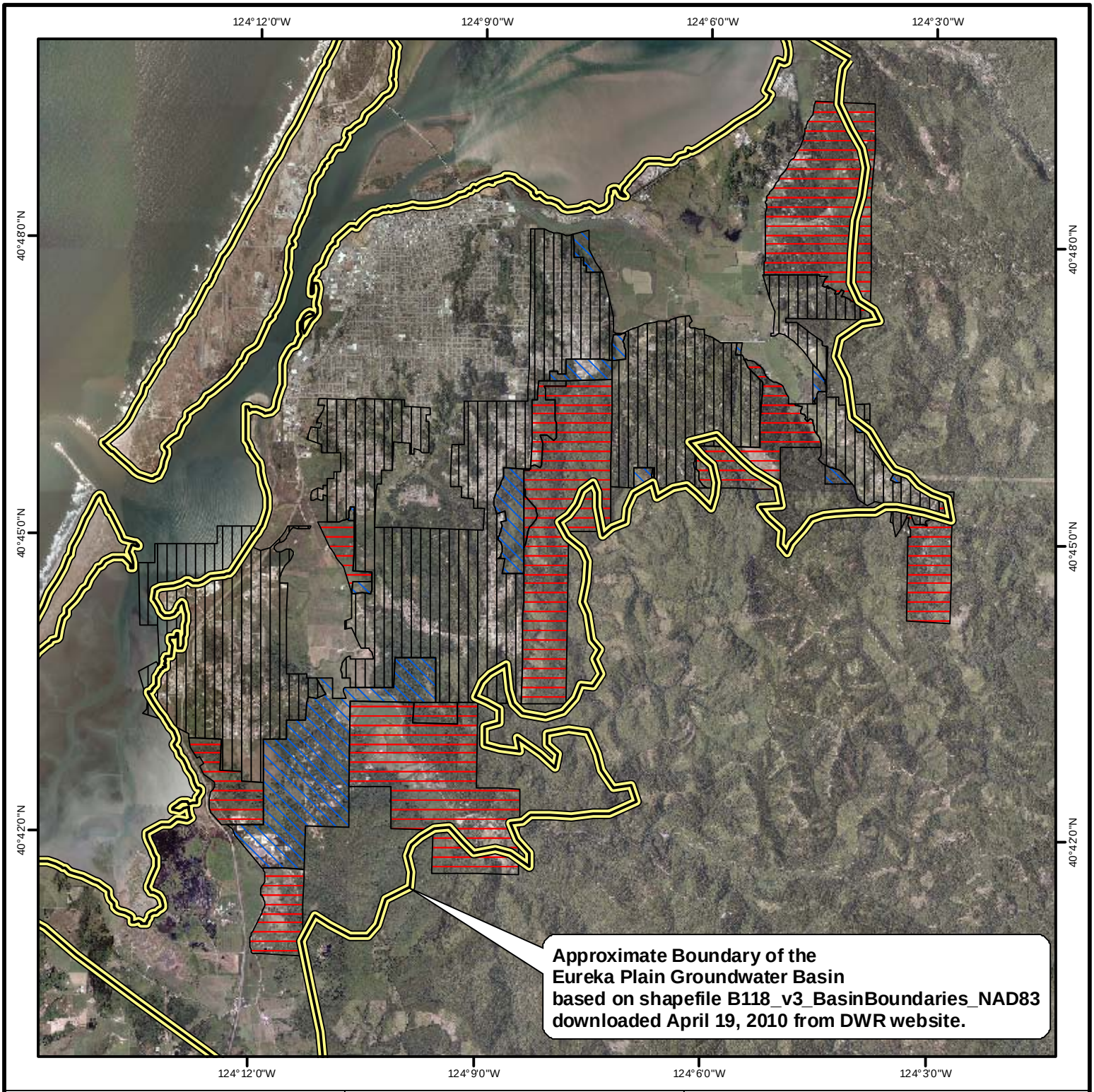
Figure 2

Site Location Map 2010 Aerial Image

Freshwater Environmental Services

Date: 7-25-11

By: SJT



N
W E
S

Miles
0 0.5 1 2 3

LEGEND

- Approximate Boundary of HCSD
- Approximate Boundary of HCSD Sphere
- Approximate Boundary of HCSD Proposed Sphere

Boundaries obtained from Humbolldt County GIS Department.
Base Image Data Source:USDA-FSA Aerial Photography Field Office Color Digital Ortho Photo Quad dated June, 2010.
ALL LOCATIONS APPROXIMATE

Humboldt Community Services District

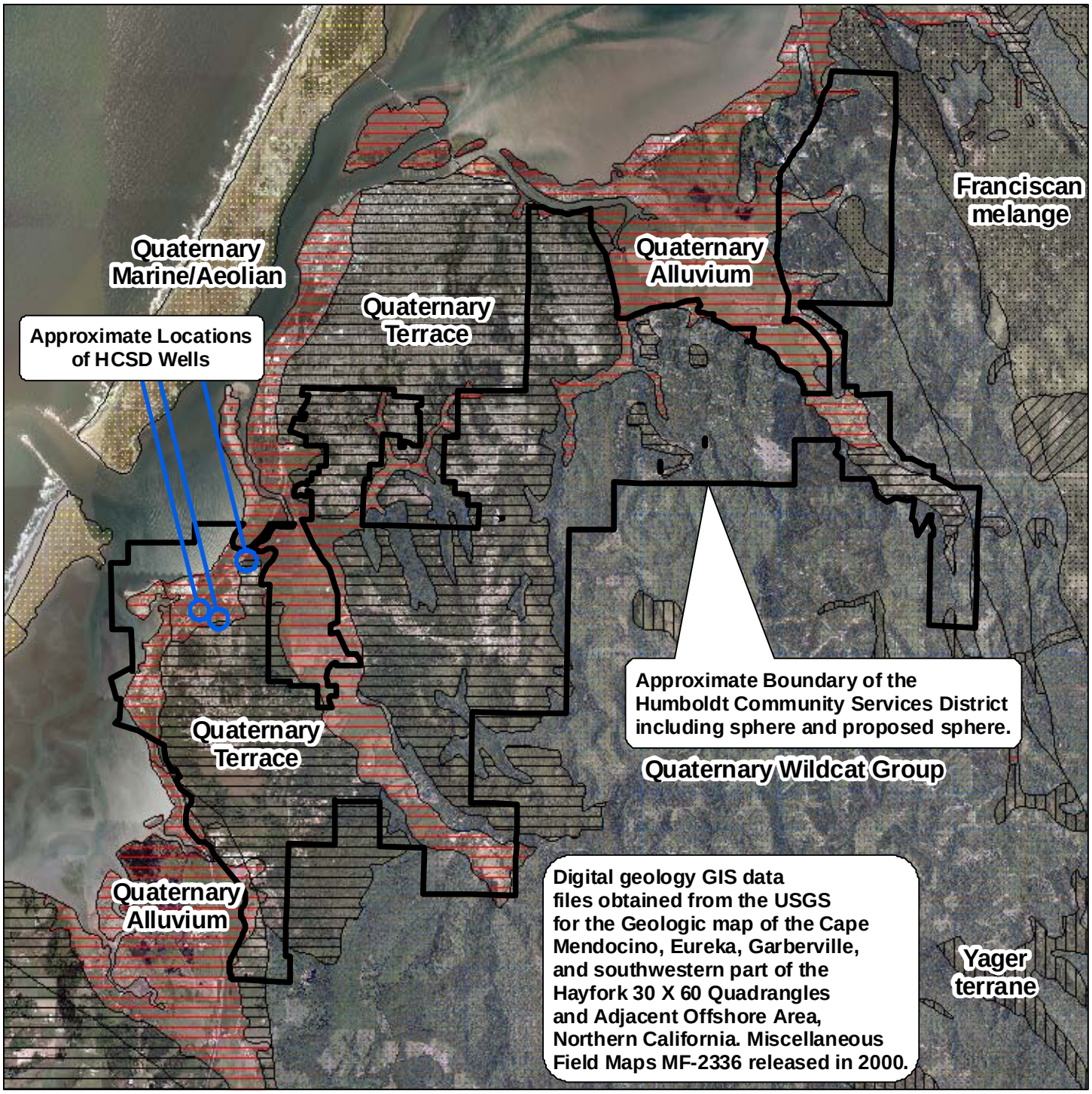
Figure 3

Eureka Plain Groundwater Basin

Freshwater Environmental Services

Date: 7-25-11

By: SJT



N
W E
S

Miles
0 0.5 1 2 3

LEGEND

Approximate Boundary of HCSD
HCSD Sphere, and HCSD Proposed Sphere

Boundaries obtained from Humbolldt County GIS Department.
Base Image Data Source:USDA-FSA Aerial Photography Field Office Color Digital Ortho Photo Quad dated June, 2010.

ALL LOCATIONS APPROXIMATE

Humboldt Community Services District

Figure 4

Geologic Map

Freshwater Environmental Services

Date: 8-2-11

By: SJT

N

NOT TO SCALE

CITY OF EUREKA

HUMBOLDT BAY

HUMBOLDT BAY MUNICIPLE WATER DIST HUMBOLDT BAY CROSSING

TRUESDALE PUMP STATION HUMB. BAY MUNICIPLE WATER DIST. INTER-TIE

HCSD ALLARD ST. CITY OF EUREKA INTER-TIE

HCSD 'E' ST. CITY OF EUREKA INTER-TIE

HCSD HEMLOCK ST. CITY OF EUREKA INTER-TIE

HCSD HUBBARD PUMP STATION AND CITY OF EUREKA INTER-TIE

CITY OF EUREKA 36" TANSMISSION WATER MAIN

BRIAR LANE 0.5 MG TANK

DANA LANE 0.375 MG TANK

WOOD GULCH 0.17 MG TANK

CUMMINGS RD 0.12 MG TANK

LENTELL 0.12 MG TANK

HCSD DISTRICT YARD RIDGEWOOD PUMP STATION .5 MG TANK 1.0 MG TANK

SPRUCE PT. WELL

SOUTH BAY WELL

PRINCETON WELL

BLUE SPRUCE 1.0 MG TANK

DONNA DRIVE .5MG TANK

RIDGEWOOD .5MG TANK

MYRTLETOWN

ROSEWOOD

PINE HILL

CUTTEN

PIGEON POINT

FRESHWATER

KING SALMON

HUMBOLDT HILL

FIELDS LANDING

RIDGEWOOD

ELK RIVER

DISTRICT BOUNDARY

HUMBOLDT COMMUNITY SERVICES DISTRICT

DEDICATED TO SERVICE SINCE 1952

HUMBOLDT COMMUNITY SERVICES DISTRICT TRANSMISSION MAINS AND INTER-TIES

JULY 2011

Figure 5

APPENDIX A
NOTICE OF PREPARATION TO NEIGHBORING MUNICIPALITIES

Humboldt Community Services District

Dedicated to providing high quality, cost effective water and sewer service for our customers

July 26, 2011

To: Kirk Girard, Humboldt County Community Development Services Department
Rachael Hernandez, City of Arcata
Bruce Gehrke, City of Eureka
Thavisak Syphanthong, Humboldt Bay Municipal Water District

Re: 60-Day Notification of Review of Humboldt Community Services District UWMP

The Humboldt Community Services District (HCSD) 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 HCSD shares a common source of water from Humboldt Bay Municipal Water District with the City of Arcata and the City of Eureka to provide water service within Humboldt County. 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 HCSD Urban Water Management Plan. Please contact me at (707) 443-4558 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,

Stephen Davidson
General Manager
Humboldt Community Services District
(707) 443-4558, ext. 214
sdavidson@humboldtcsd.com

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

City of Arcata
Eric Lust
736 F Street
Arcata, California 95521

City of Eureka
Bruce Gehrke
531 K Street
Eureka, California 95501

Humboldt Bay Municipal Water District
Thavisak Syphanthong
828 Seventh Street/P.O. Box 95
Eureka, CA 95502

APPENDIX B
NOTICE OF PUBLIC HEARING FROM THE LOCAL NEWSPAPER

The Times-Standard

PO Box 3580
Eureka, CA 95502
707-441-0571
legals@times-standard.com

HUMBOLDT COMMUNITY SERVICES DISTRICT/LEGAL/TSL
PO BOX 158
CUTTEN CA 95534

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of Humboldt

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-mentioned matter. I am the principal clerk of the printer of THE TIMES-STANDARD, a newspaper of general circulation, printed and published daily in the City of Eureka, County of Humboldt, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Humboldt, State of California, under the date of June 15, 1967, Consolidated Case Numbers 27009 and 27010; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit,

9/14/2011, 9/21/2011

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Eureka, California,
This 21th day of September, 2011

Signature

Thelma McFarland

This space is for the County Clerk's Filing Stamp

Legal No. **0004160307**

HUMBOLDT COMMUNITY SERVICES DISTRICT NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN of a public hearing for the purpose of receiving public comment and testimony regarding the Draft Humboldt Community Services (HCSD) Urban Water Management Plan (UWMP). The District 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.
The UWMP Act (California Water Code Sec.10610 et seq.) requires urban water suppliers to report, describe, and evaluate the following four areas:

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

A copy of the Draft UWMP is available at the District office for review.
The public hearing will also be held for the purposes to solicit input for the HCSD's intention to approve the UWMP.
The HCSD will hold this public hearing on Tuesday, September 27, 2011 at 5 PM at the District Office at 5055 Walnut Drive, Eureka. Any and all interested parties are invited to attend and be heard at this public hearing. Further information can be obtained from the HCSD General Manager at 5055 walnut Drive, Eureka, CA 95503 or by telephone at (707)443-4558 ext 214
9/14,21

APPENDIX C
BASELINE AND GOALS SPREADSHEET

	GPCD	GPCD	10Yr Rolling Ave.	10Yr Rolling Ave.	5Yr Rolling Ave.	5Yr Rolling Ave.
Year	Production	Sales	Production	Sales	Production	Sales
1984						
1985						
1986						
1987						
1988	147	105.3				
1989	163	107.7				
1990	169	108.1				
1991	135	104.5				
1992	133	101.5				
1993	123	98.0				
1994	128	98.6				
1995	128	100.3				
1996	130	103.3				
1997	132	105.7	138.8	103.3		
1998	125	99.9	136.6	102.7		
1999	131	106.9	133.4	102.7		
2000	133	102.7	129.8	102.1		
2001	130	100.8	129.3	101.8		
2002	135	102.0	129.5	101.8		
2003	129	97.6	130.1	101.8		
2004	130	98.9	130.3	101.8		
2005	123	91.2	129.9	100.9		
2006	125	91.4	129.3	99.7		
2007	123	89.6	128.5	98.1	126.1	93.7
2008	120	85.1	128.0	96.6	124.3	91.2
2009	124	83.6	127.3	94.3	123.0	88.2
2010	118	78.6	125.8	91.9	122.0	85.6
2011						
2012						
2013				Method 2- 80% goal	104.2	
2014				Method 3- 95% regional goal	123.5	
2015	123.0			**Setp 3 95% 5-year Production GPCD**	**119.8**	
2016						
2017						
2018						
2019						
2020	**120.0**					

APPENDIX D
HCSD Ordinance Number 77-3

APPENDIX C

ORDINANCE NO. 77-3

AN ORDIANCE ESTABLISHING RULES AND REGULATIONS FOR RATIONING WATER DURING A WATER SHORTAGE EMERGENCY AND ESTABLISHING PENALTIES FOR VIOLATIONS THEREOF

BE IT ORDAINED BY the Board of Directors of Humboldt Community Services District as follows:

Section 1. The Board of Directors of Humboldt Community Services District has declared that a water shortage emergency condition prevails in the area served by the Humboldt Community Services District due to conditons prevailing throughout the State of California and especially in the service area of the Humboldt Bay Municipal Water District.

This ordinance is intended to allocate equitably the water available to the Humboldt Community Services District during such emergency to the end that sufficient water will be available to human consumption, sanitation, and fire protection. The specific uses regulated or prohibited in this Ordinance are nonessential, if allowed would constitute wastage of water and should be prohibited pursuant to the Water Code Section 350 et. seq., Water Code Section 71640 et. seq., and the common law. The actions taken hereinafter are exempt from the provisions of the California Environmental Quality Act of 1970 as projects undertaken as immediate action necessary to prevent or mitigate an emergency pursuant to Section 15071 (c) of the State EIR Guidelines.

Section 2. Definitions. For the purpose of this ordinance, the following term, phrases, words, and their derivations shall have the meaning given herein. When not inconsistent with the context, words used in the present tense include the future, words in the plural number include the singular number, and words in the singular number include the plural number. The word "shall" is always mandatory and not merely directory.

A. "District" is Humboldt Community Services District.
B. "Board of Directors" is the elected Board of Directors of Humboldt Community Services District.
C. "Customer" is any person using water supplied by the Humboldt Community Services District.
D. "Manager" is the Manager of the Humboldt Community Services District.
E. "Person" is any person, firm, partnership, association, corporation, company, or organization, or organization of any kind.
F. "Water" is water from the Humboldt Community Services District.

G. "Outdoor surface" is any patio, porch, veranda, driveway, or sidewalk.
H. "Nonessential use" is any use not required.
I. "Nonessential user" is any user other than a domestic residential customer or facility providing for health and safety.

Section 3. Application. The provisions of this ordiance shall apply to all customers using water both in and outside the Boundaries of Humboldt Community Services District, regardless of whether any customer using water shall have a contract for water service with the Humboldt Community Services District.

Section 4. Large Water Users. No person whose historic monthly average water use of any three month period exceeds 50,000 gallons per month, hereinafter called "large water users", shall irrigate, sprinkle, or water any shrubbery, trees, lawns, grass, ground covers, plants, vines, gardens, vegetables, flowers, or any other vegetation except as assigned by the Manager after consultation with individual large water users.

Section 5. Further prohibition. No person or customer shall cause or permit any water furnished to him or her by the Humboldt Community Services District to run to waste in any gutter or otherwise.

Section 6. Manager may prohibit. Whenever the Manager determines that the water available to the Humboldt Community Services District is insufficient to permit nonessential use and that all water then available to said District should be used solely for human consumption, sanitation, and fire protection, he may order and direct individually or collectively that nonessential use shall not be permitted by any person or customer. While such order is in effect, no person or customer shall fill with District 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 in order of the Manager. Violations shall be punished as provided in Section 10 of this ordinance.
The Manager shall use every available means to inform customers that such order is in effect.

Section 7. Manager may limit the amount of water delivered to customers.
Whenever the Manager determines the water available to the Humboldt Community Services District is insufficient to meet the demands of customers the District and that all water available to said City should be protected for human consumption, sanitation and fire protection, he may order limits be imposed on individual consumption as determined and specified by resolution of the Board of Directors including penalties in addition to those specified in Section 10 of this ordinance.

Section 8. Fines and Penalties. Except as otherwise provided herein, violations of any provision of this ordinance shall be punished as follows:

Violation	Classification	Penalty
First violation	Infraction	$10
Second violation	Infraction	$30
Third violation and subsequent violations within a 6-month period	Misdemeanor	$100

The Manager shall forthwith direct and cause disconnection of the water service of any person or customer cited for a misdemeanor under this section. Such service shall be restored only upon payment of the turn-on charge fixed by the Board of Directors as provided in the Basic Water Ordinance of the District. Each day any violation of this ordinance is committed or permitted to continue shall constitute a separate offense and shall be punishable as such hereunder.

Section 9. Enforcement.

A. Each Police Officer of the County of Humboldt shall, in connection with his duties imposed by law, diligently enforce the provisions of this ordinance.

B. The Manager and all employees of the Humboldt Community Services District, and Humboldt Fire District #1, have the duty and are authorized to enforce the provisions of this ordinance and shall have all the powers and authority contained in California Penal Code Section 836.5, including the power to issue written notice to appear.

Section 10. When ordinance is effective.

A. The provisions of this ordinance shall be in full force and effect only upon adoption by this Board of Directors of a resolution declaring that a water emergency condition prevails pursuant to California Water Code Section 350 and following.

B. The provisions of this ordinance shall be of no further force or effect when the Board determines that a water shortage no longer exists.

Robert F. Brown
President of Board, Humboldt
Community Services District

ATTEST:

Mary J. Dunn
Secretary, Board of Directors
Humboldt Community Services District

SECRETARY'S CERTIFICATE

I hereby certify that the foregoing is a true and complete copy of Ordinance No. 77-3 passed and adopted at a regular meeting of the Humboldt Community Services District held on the 14th day of July, 1977, by the following roll call vote:

AYES: Brown, Bongio, Bollmann
NOES: None
ABSENT: Selvage and Hobbs

Mary J. Dunn

APPENDIX E
Humboldt Bay Municipal Water District 2010 UWMP, Drought Planning

5.2.6 Analysis of Revenue Impacts of Reduced Sales During Shortages

Each wholesale customer must gage the revenue and expenditure impact of the action stages. The expenditure and revenue impacts on the District are negligible since the wholesale rates are designed to cover costs incurred by the District in producing and distributing the water. With less water to produce, there would be less expense incurred by the District. Therefore, expenditures and revenues for costs directly related to the amount of water produced (e.g. costs for power for pumping) will both decrease as deliveries of water are curtailed. If the shortage were to continue for a prolonged period, the District could reduce staff in order to cut costs as the District would not be producing and distributing water at normal levels. The District also has a reserve account to act as a buffer to cover fixed costs for a short period of time if the District were to need it.

5.2.7 Prohibitions, Consumption Reduction Methods, and Penalties

As noted earlier in this plan, each wholesale customer is responsible for adopting plans to implement the reductions in water use called for by the action stages outlined above. Effectiveness of this plan will be monitored on a daily basis using continuously metered data from Ruth Lake and the metered connections to all wholesale municipal and industrial customers.

Tables 36 (Water shortage contingency — mandatory prohibitions) shows examples of prohibitions and the stage when those prohibitions become mandatory. These prohibitions assume that the District is operating at normal levels prior to loss of its industrial customers.

Table 36
Water shortage contingency — mandatory prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Maximum usage (peaking) by wholesale industrial customers	2
Wholesale industrial water usage more than 80% of previous two years of average use	4
Wholesale industrial water usage other than amounts required for human consumption, sanitation, and fire protection	5
Wholesale and retail customer usage more than 50% of previous two years of actual average usage	5

Table 37 (Water shortage contingency — consumption reduction methods) shows the consumption reduction methods and the stages when the method takes effect. This table also shows the projected percentage reduction from Stage 3 through Stage 5, when the consumption reduction methods are required.

Table 37 Water shortage contingency — consumption reduction methods		
Consumption Reduction Methods	**Stage When Method Takes Effect**	**Projected Reduction (%)**
Release from storage only amount of water needed for in-stream and water supply purposes	1	
General voluntary water conservation measures with wholesale customers	2	
Public education efforts encouraging water conservation	2	
Require all wholesale and retail customers to reduce usage	3	10% to 15%
Require all wholesale and retail customers to reduce usage further	4	16% to 30%
No water for industrial processes and reduce wholesale and retail customer usage up to 50%	5	50%

The District does not have any penalties or charges in place at this time, therefore, Table 38 (Water shortage contingency — penalties and charges) does not show any penalties or charges. The District's Board of Directors reserves the right to adopt penalties for non-compliance with various action stages, but feels it is not necessary to do so at this time. Penalties will be considered when a water shortage emergency is actually declared.

Table 38 Water shortage contingency — penalties and charges	
Penalties or Charges	**Stage When Penalty Takes Effect**
District does not have any penalties or charges at this time	N/A

5.2.8 Draft Ordinance and Use Monitoring Procedure

To determine the actual reductions in use of water during a water shortage, the District will use its Supervisory Control and Data Acquisition (SCADA) system to monitor distribution to its customers on a daily basis. In the event of a power outage, the District has two auxiliary power generators as standby power sources. The first generator is a 35 kW (kilowatt) generator and the second is a 2 MW (megawatt) generator. Therefore, the SCADA system will continue operating during power outages and continue monitoring distribution.

A copy of the District's draft Water Shortage Contingency Resolution for Declaring a Water Shortage Emergency and Implementing the District's Water Shortage Contingency Plan is attached to the District's UWMP in Appendix F.

5.3 Water Quality

As discussed above, drinking water delivered by the District is drawn from wells located in the Mad River. These wells draw water from the sands and gravel of the aquifer

located under the riverbed. The gravel and sands through which the water is drawn provides a natural filtration process which yields source water for the District's regional drinking water system that is of very high quality. Furthermore, the results from the District's ongoing water monitoring and testing program indicate that the District's water quality is very high and meets safe drinking regulatory standards, as has consistently been the case over the years.

The only water quality issue occasionally encountered by the District in the past was turbidity. Generally, turbidity in the Ranney Well source water has been very low and meets the turbidity standards set by the California Department of Public Health (CDPH). However, during or following severe winter storm events, turbidity in the source water could rise beyond the standards set by CDPH. In the late 1990s, an extremely heavy "El Nino" rainy season caused a prolonged series of storms that raised turbidity in the source water to such a level that CDPH became concerned that it could potentially interfere with the disinfection process, and therefore, pose a threat to public health. In 1997, CDPH directed all of the Public Water Systems in the Humboldt Bay area (the District and its wholesale municipal customers) to address the wintertime turbidity issue and to meet the turbidity standards established by CDPH. The District initiated a process with its seven municipal customers to determine the most cost effective way to meet the State's requirement. The solution was to design and construct a regional Turbidity Reduction Facility (TRF). The TRF was completed in April 2003 and now operates during the winter storm season to reduce higher turbidities in accordance with the State's standards.

As the District's ongoing water monitoring and testing program indicates that the District's water quality has been and continues to be very high and with the turbidity issue taken care of by the TRF, the District does not foresee any current or projected water supply impacts resulting from water quality. Therefore, Table 30 (Water quality – current and projected water quality impacts) shows zero water quality impacts throughout the 20-year UWMP planning horizon.

Table 30
Water quality — current and projected water supply impacts (AFY)

Water source	Description of condition	2010	2015	2020	2025	2030
Mad River Storage & Diversions		0	0	0	0	0

5.4 Drought Planning

As stated in earlier sections, the District has permitted rights for 84,000 AFY of water to supply its wholesale customers. Table 11 shows that the highest projected total water demand for the District's wholesale customers in 2030 (which includes the District's demand objective for raw water of 11,200 AFY, per Option A of the Implementation Plan), is approximately 30% of this permitted water supply. With this in mind, the following sections will provide data for each of the following water year types: normal,

single dry, and multi-dry. Supply and demand comparisons for each water year type will also be discussed.

Table 27 captures the specific base water years that each type of water year falls into.

Table 27 Basis of water year data	
Water Year Type	**Base Year(s)**
Average Water Year	1989
Single-Dry Water Year	1977
Multiple-Dry Water Years	1990, 1991, 1992

5.4.1.1 Normal Water Year

During a normal water year, the Ruth Lake area averages 69.8 inches of rainfall, about 173,000 AF of water flow into the reservoir via the Mad River, and the average runoff for the watershed near the District's diversion facilities at Essex is 982,600 AFY (over the entire record period from 1963 to 2010). The average annual runoff data was provided by USGS at Gage Station 1148100 on the Mad River near Arcata, CA. As shown in Table 27, the Water Year ending in 1989 was considered an average water year because the average runoff for the watershed that year was 985,364 AFY, which is close to the average annual runoff for the watershed as provided.

5.4.1.2 Single Dry Water Year

The water year ending in 1977 was the driest recorded for the District, far drier than any other. Rainfall in the Ruth area was 29 inches, or 41% of normal (69.8 inches). Flows into the reservoir were 26,000 AFY, or 15% of normal (173,000 AFY). The runoff for the watershed measured near the District's diversion facilities was 109,107 AFY, or 11% of normal (982,600 AFY). The average reservoir volume for the water year was 21,000 AF, which is 44% of capacity (48,030 AF) and 51% of normal (41,000 AF). The reservoir was drawn to 13,000 AF, or 27% of its capacity (48,030 AF) at the end of the water year.

Fall storms arrived in November 1977 and quickly refilled the reservoir. This water year was severely dry throughout the entire state of California and was a very exceptional year in the District's history:

- In 47 years of records, it was the only year in which rainfall was less than 50% of normal (69.8 inches).
- It was also the only year in which the reservoir was not filled to capacity.
- Total flows into the reservoir via the Mad River were half the value of the next driest year.
- Runoff for the watershed and average reservoir volume were each 60% of the next driest year.

5.4.1.3 Multiple Dry Water Years

The three water years between October 1989 and September 1992 represent the driest multiple years recorded for the District:

- Rainfall for this period averaged 42 inches per year, or 60% of normal.
- Of the three water years, the driest year for rainfall was water year 1990/1991 with 37 inches, or 53% of normal.
- Flows into Ruth Lake via the Mad River averaged 69,000 AFY, or 40% of normal (173,000 AFY).
- The runoff for the watershed above the District's diversion facilities was 371,300 AFY, or 37% of normal (982,600 AFY).
- Despite the diminished rainfall and runoff, rainfall was more than sufficient to refill the reservoir each year.
- Reservoir volume during this period averaged 37,000 AF which is 77% of capacity (48,030 AF) and 90% of normal (41,000 AF).

5.4.1.4 Comparing Supply Reliability with Different Water Year Types

Table 28 shows the runoff amounts for the normal, single dry and multiple dry water years. This table also shows the single dry water year runoff and each of the three multiple dry water years runoff amounts as a percentage of the normal water year's runoff amount. As expected, the single dry water year runoff has the lowest percentage when compared to the percentage of the other three years. However, although the single dry water year runoff amount was only 11.1% of the normal water year amount, this 109,107 AFY is still enough to satisfy the District's permitted supply amount of 84,000 AFY should the District need it. Therefore, the other watershed runoff amounts in the multiple dry water years (ending 1990, 1991, 1992) will also meet the District's permitted supply as well as they are all more than the District's permitted supply amount of 84,000 AFY (Table 28).

Table 28
Supply reliability — historic conditions (AFY)

Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
		1990	1991	1992
982,600	109,107	571,815	371,340	282,794
Percent of Average/Normal Year:	11.1%	58.2%	37.8%	28.8%

To project multiple dry water year supply conditions into the future, the historic runoff values from the multiple dry water years ending in 1990, 1991 and 1992 were used. These three water years were the only three consecutive multiple dry water years in the District's recent history. Therefore, the watershed runoff for water year 2011 is projected as 571,815 AFY (same as in 1990), for 2012 as 371,340 AFY (same as 1991) and for 2013 as 282,794 AFY (same as in 1992). Since these projected multiple dry water year supply values are the same as the historic values for 1990, 1991 and 1992, the projected watershed runoff amounts will also meet the District's permitted supply as well.

Table 31 Supply reliability — current water sources (AFY)				
Water supply sources	Average / Normal Water Year Supply	Multiple Dry Water Year Supply		
		Year 2011	Year 2012	Year 2013
Mad River Storage & Diversions	982,600	571,815	371,340	282,794
Percent of normal year:	100.0%	58.2%	37.8%	28.8%

Table 32 shows the difference between supply and demand as projected in five year increments from 2015 through 2030 under normal water year conditions. Under normal year conditions when the watershed runoff is approximately 982,600 AFY, there is more than enough water to meet the District's permitted water right of 84,000 AFY, and therefore, meet demands. This difference between supply and demand is shown both as a percentage of supply and as a percentage of demand. As a percentage of supply, the difference in 2015 is approximately 87%, which does not include any potential demands for raw water use. The difference as a percentage of supply is reduced in 2030 to approximately 72%. This reduction in 2030 is due to the District's goal of developing new demands for raw water use by 2030 as shown in Table 10. As a percentage of demand, the difference amount was approximately 642% in 2015 and is reduced to approximately 257% by 2030, which is also due to the District's goal of developing new demands for raw water use by 2030. This shows that during the normal year, the District has more than enough supply to meet demand as projected into the future.

Table 32 Supply and demand comparison — normal year (AFY)				
	2015	2020	2025	2030
Supply totals (from Table 16)	84,000	84,000	84,000	84,000
Demand totals (From Table 11)	11,315	17,240	17,597	23,549
Difference	72,685	66,760	66,403	60,451
Difference as % of Supply	86.5%	79.5%	79.1%	72.0%
Difference as % of Demand	642.4%	387.3%	377.4%	256.7%

The watershed runoff for the single dry water year was 109,107 AFY as shown in Table 28. As this amount is more than the District's permitted water supply of 84,000 AFY, the District still has the 84,000 AFY of water available as it does during a normal water year. Therefore, Table 33 shows the same calculations as in Table 32 for the normal water year condition showing the supply totals as 84,000 AFY from 2015 through 2030. The data shows that the District has more than enough water supply to meet demand, even in a single dry water year situation.

Table 33 Supply and demand comparison — single dry year (AFY)				
	2015	2020	2025	2030
Supply totals	84,000	84,000	84,000	84,000
Demand totals	11,315	17,240	17,597	23,549
Difference	72,685	66,760	66,403	60,451
Difference as % of Supply	86.5%	79.5%	79.1%	72.0%
Difference as % of Demand	642.4%	387.3%	377.4%	256.7%

For the multiple dry water year scenario, Table 31 projects the multiple dry water year supply amounts as 571,815 AFY (for 2011), 371,340 AFY (for 2012), and 282,794 AFY (for 2013). As these supply amounts are larger than the District's permitted supply amount of 84,000 AFY, the District is able to maintain its water supply during these consecutive dry water years as well. Therefore, Table 34 also shows the District's water supply projections for multiple dry water years as its permitted amount of 84,000 AFY for 2015 through 2030. The data shows that the District has more than enough water supply to meet demand, even during multiple dry water years.

Table 34 Supply and demand comparison — multiple dry-year events (AFY)					
		2015	2020	2025	2030
Multiple-dry year first year supply	**Supply totals**	84,000	84,000	84,000	84,000
	Demand totals	11,315	17,240	17,597	23,549
	Difference	72,685	66,760	66,403	60,451
	Difference as % of Supply	86.5%	79.5%	79.1%	72.0%
	Difference as % of Demand	642.4%	387.3%	377.4%	256.7%
Multiple-dry year second year supply	**Supply totals**	84,000	84,000	84,000	84,000
	Demand totals	11,315	17,240	17,597	23,549
	Difference	72,685	66,760	66,403	60,451
	Difference as % of Supply	86.5%	79.5%	79.1%	72.0%
	Difference as % of Demand	642.4%	387.3%	377.4%	256.7%
Multiple-dry year third year supply	**Supply totals**	84,000	84,000	84,000	84,000
	Demand totals	11,315	17,240	17,597	23,549
	Difference	72,685	66,760	66,403	60,451
	Difference as % of Supply	86.5%	79.5%	79.1%	72.0%
	Difference as % of Demand	642.4%	387.3%	377.4%	256.7%

APPENDIX F
HCSD Resolution 2011-08

RESOLUTION 2011-08

A RESOLUTION OF THE

HCSD BOARD OF DIRECTORS

ADOPTING THE

HCSD 2010 URBAN WATER MANAGEMENT PLAN

WHEREAS, the District prepared a 2010 Urban Water Management Plan (UWMP) in compliance with the requirements of the California Department of Water Resources (DWR) pursuant to Urban Water Management Act (UWMP Act) and the Water Conservation Bill of 2009; and

WHEREAS, the UWMP Act requires development and implementation of a written UWMP that reports, describes, and evaluates the following four areas:

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

WHEREAS, the Board's UWMP will be updated every five years as required by the UWMP Act; and

WHEREAS, the purpose of the UWMP is for water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future water demands; and

WHEREAS, the evaluation of four areas effecting the District's water supply will allow District staff to better manage the water distribution system and help to ensure efficient and cost effective operation of the District's water system into the future; and

WHEREAS, the procedural requirements of the UWMP include public notice, Board review and approval, that the District has completed, considered and adopted the Plan; and

WHEREAS, a proposed draft copy of the District's 2010 UWMP was published in the local newspaper and posted to the District's website for more than 15 days; and

WHEREAS, the District did not receive any comments as a result of the posted notice or website posting stating that the District Board of Directors would consider the UWMP for approval and would receive public comments during the Board meeting of September 27, 2011.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors of the HCSD hereby approves the HCSD 2010 Urban Water Management Plan and its implementation.

PASSED AND ADOPTED by the Board of Directors of the HCSD on September 27, 2011 by the following vote:

AYES:	Bongio, McKenny, Saunderson, Scolari
NOES:	None
ABSENT:	Frost
ABSTAIN:	None

Signed:

Kevin McKenny, President
Board of Directors

ATTEST:

Brenda Franklin, Board Secretary