DROUGHT PLAN
FOR
GRIZZLY FLATS COMMUNITY SERVICES DISTRICT

December 2007

This report reflects a general approach that is subject to Grizzly Flats Community Services District staff and Board of Director discretion and declaration.

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December 10, 2007

BROWN AND CALDWELL

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017-130868-001

Subject: Drought Plan for Grizzly Flats Community Services District

Dear Mr. Hovland and Mr. Hetland:

We are pleased to submit to you this Drought Plan for the Grizzly Flats Community Services District. Drought preparedness is an essential element of long-term water supply planning for El Dorado County. The Brown and Caldwell team has delivered a drought plan that presents the actions and procedures for preparing for, identifying, and responding to a drought.

We enjoyed working with you and look forward to your feedback on this important project. Please contact Tess Kretschmann, Lisa Maddaus or myself at (916) 444-0123 to discuss this project report in further detail.

Sincerely,

BROWN AND CALDWELL

Paul Selsky. P.E.
Vice President

Enclosures
TK:ds

P:\30000\130868 EDCWA Phase II Drought Study\Project Reports\GFCSD\GFCSD cover letter.doc

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LIST OF ACRONYMS

ac-ft	acre-feet
Ag	Agricultural
AR	administrative regulations
BP	Board Policy
County	El Dorado County
DSR	days supply remaining
DWR	Department of Water Resources
EDCWA	El Dorado County Water Agency
EDHWWTP	El Dorado Hills Wastewater Treatment Plant
EID	El Dorado Irrigation District
ENSO	El Nino Southern Oscillation
ET	Evapotranspiration
gpd	gallons per day
GDPUD	Georgetown Divide Public Utility District
GFCSD	Grizzly Flats Community Services District
M&I	Municipal and Industrial
NDSR	normalized days supply remaining
NOAA	National Oceanic & Atmospheric Administration
PG&E	Pacific Gas and Electric
Plan	drought preparedness and response plan
SMUD	Sacramento Municipal Utility District
SRI	supply remaining index
SVM	Shared Vision Model
UARP	Upper American River Project
UFW	Unaccounted-for water
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WMP	Water Management Plan

GRIZZLY FLATS COMMUNITY SERVICES DISTRICT DROUGHT PLAN

DROUGHT ACTION PLAN

Grizzly Flats Community Services District (GFCSD) drought stage water supply conditions, objectives, and response actions including water use reduction targets, are summarized in Table 1. The Drought Plan involves an introductory Stage 1 drought response during which all customers are informed of drought and total customer demand reduction is targeted for 15 percent. At Stage 2 water use decisions continue to be entrusted to the customer as long as the overall rationing goal of 30 percent is met; this is a voluntary/honor system approach. If Stage 2 fails, then a strict allotment approach is implemented with a stiff penalty rate in Stage 3 with a total demand reduction goal of 50 percent. This mandatory 50 percent reduction is applied to each parcel's 300 gallons per day (gpd) allotment.

Table 1. Drought Plan Summary

Water supply conditions	Drought stage	Objective	Response actions
Normal 0% Total Supply Reduction	None - Ongoing conservation measures; Prohibition of Wasted Water in effect.	Public awareness	Normal actions
Slightly Restricted Water Supplies (below normal) Up to 15% Total Supply Reduction	Drought Stage 1 - Voluntary reductions in use	Initiate public awareness of predicted water shortage and encourage conservation	Encourage voluntary measures to decrease "normal" demand up to 15%
Moderately Restricted Water Supplies Up to 30% Total Supply Reduction	Drought Stage 2 – Increased voluntary restrictions on use	Increase public understanding of worsening water supply conditions, encourage voluntary conservation measures	Encourage voluntary measures to decrease "normal" demand up to 30%
Severely Restricted Water Supplies Up to 50% Total Supply Reduction	Drought Stage 3 – Mandatory restrictions (severe prohibitions) on use	Ensure that water use is limited to health and safety purposes	Enforce extensive restrictions on water use and implement water rationing to decrease demand up to 50% of 300 gpd/parcel allotment

Ongoing Drought Plan Implementation Actions

Ongoing Drought Plan implementation actions will be completed both during periods of non-drought and drought periods. These activities can be characterized as proactive actions that prepare for drought through monitoring, public outreach, and resource management practices.

Policy and regulation

1. Review and update Drought Plan every 5 years or as needed based on new gage data, new supply, operational changes, or change in expected water demand
2. Continue water loss management procedures (leak identification).
3. Enforce Prohibition of Wasted Water (see Appendix F).
4. Continue conservation policies and water-efficient plumbing codes.
5. Review and refine rate stabilization policy relating to drought impacts every 5 years.
6. Understand and comply with legal and regulatory requirements for drought management.

Monitoring

1. Monitor trigger plan quarterly to assess drought status.
   - Check GFCSD storage reservoir levels at the end of July.
   - If storage is less than 22 acre- feet (ac-ft), enter a Stage 1 drought.
   - If the reservoir levels are below 20 ac-ft enter Stage 2 drought.
   - If the levels at the end of July or August are below 12 ac-ft, go directly into a Stage 3 drought.
   - For every subsequent month keep the August drought stage through November unless storage levels rise above 12 ac-ft.
   - If the reservoir levels are above 12 ac-ft in August then reduce the drought stage by one stage each month until no drought is called.
2. Monitor system demands.
3. Install and monitor additional stream gages (solicit USGS and DWR for support).

Public outreach

1. Develop and maintain drought awareness and public education materials, tools, and protocol.

Resource management

1. Pursue drought impact avoidance activities.
   - Existing well
   - Reduce leakage in existing reservoir
   - Off-stream storage alternative
2. Pursue study of underground flows on Big Canyon diversion; investigate the feasibility of the installation of a drought curtain.
3. Maintain interagency coordination annually as shown in Figure 1. Figure 1 depicts the type and frequency of interagency coordination activities that will be pursued by the Drought Interagency Coordination Committee (DICC).
4. Confirm and maintain commitment of Drought Advisory Committee (DAC) members as shown in Figure 2. Figure 2 depicts the suggested interagency organizational structure.
5. Consider establishing trucking contracts for water hauling (annually).

6. Pursue land trade for off-stream storage reservoir site.
7. Establish procedure by which residents within GFCSD on wells apply for emergency relief.

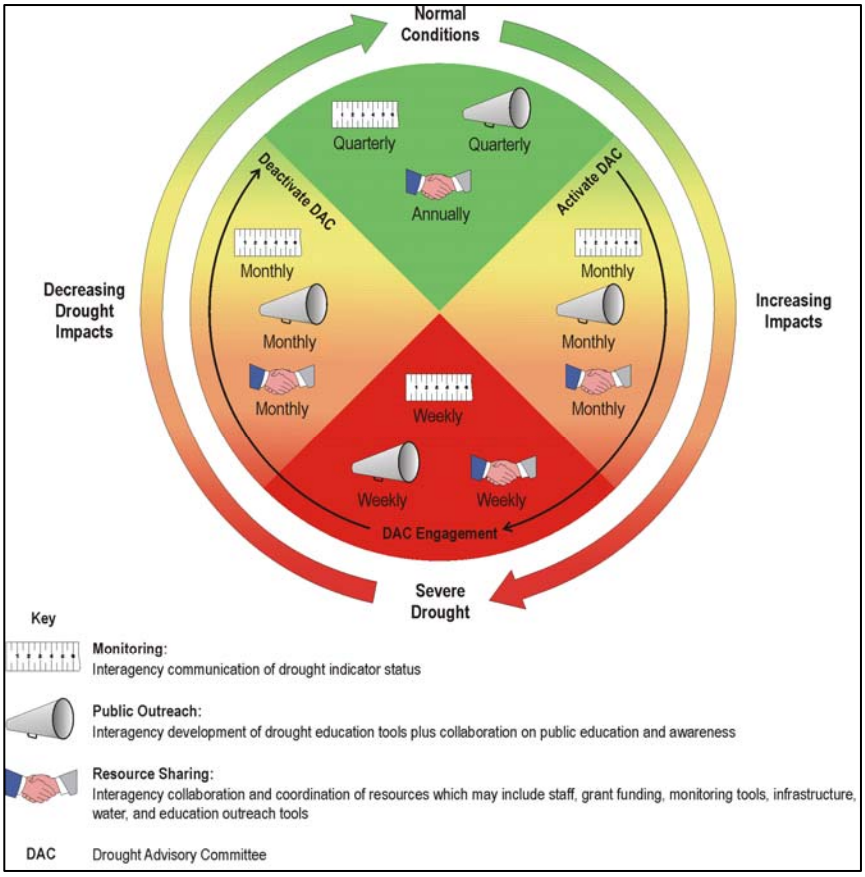


Figure 1. Drought Interagency Coordination Committee Activities

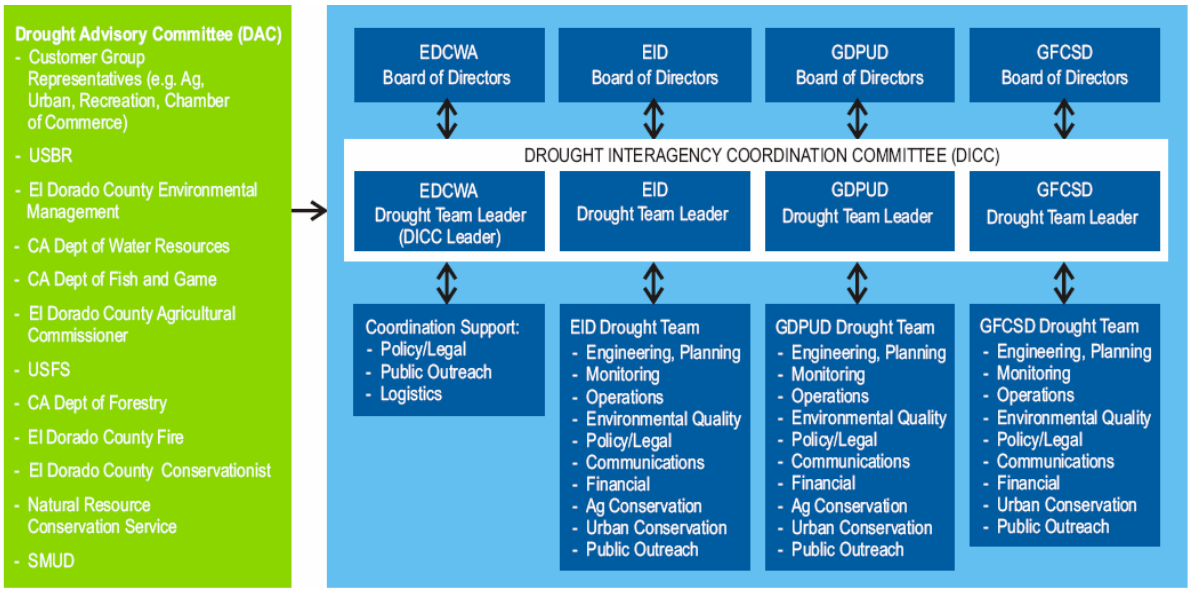


Figure 2. Drought Interagency Organization Structure

Drought Stage 1 Actions

Drought Stage 1 actions are intended to initiate public awareness of predicted water shortage and encourage conservation. Stage 1 actions target up to 15 percent demand reduction through implementation of voluntary measures.

Policy and regulation

1. Implement Stage 1 water shortage response measures. Customers are suggested to:
   - Apply irrigation water only during the evening and early morning hours (8 PM to 6 AM) to reduce evaporation losses.
   - Inspect all irrigation systems, repair leaks, and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray.
   - Change the minutes of run-time for irrigation valves consistent with fluctuations in weather as determined by evapotranspiration data, obtained from El Dorado County Water Agency (EDCWA) or evapotranspiration controllers.
   - Reduce minutes of run-time for each irrigation valve if water run-off (gutter flooding) is occurring.
   - Utilize water conservation incentive, rebate, and giveaway programs to replace high water-using plumbing fixtures and appliances with water efficient models.
   - Take advantage of the free information available from GFCSD on how to use water efficiently, read a water meter, repair leaks, and irrigate efficiently.
   - Do not refill a swimming pool that had been drained.
   - Fix leaks.
   - Wash vehicles from a bucket. Use a hose equipped with a shutoff nozzle for a quick rinse.
2. Drought Team Leader provides monthly updates on drought status to GFCSD management and Board.

Monitoring

1. Assess current drought stage bimonthly.
2. Consider potential future hydrologic conditions.
3. Monitor water demand monthly to assess water savings accomplished.

Public outreach

1. Initiate community-oriented drought awareness with focus on community water use reduction goals and range of voluntary steps to accomplish savings.
2. Reacquaint customers with GFCSD's Prohibition of Wasted Water and introduce Stage 1 recommended water shortage response measures.
3. Provide monthly updates to public on current drought stage.
4. Provide monthly updates to public on community demand response status.
5. Develop procedure for customer reporting of wasted water.

Resource management

1. Monthly Drought Interagency Coordination Committee meetings.
2. Confirm commitment by Drought Advisory Committee members.

Drought Stage 2 Actions

Drought Stage 2 action items are intended to increase public understanding of worsening water supply conditions and encourage voluntary conservation measures to decrease "normal" demand up to 30 percent. Stage 2 activities include a continuation of activities described previously under the Stage 1 actions and ongoing actions. The achievement of the water use rationing goal is measured by overall performance of the entire customer population, based on GFCSD production meters. It is important to note that demand reduction goals are not by individual customer, but are the goal for the entire customer base.

Policy and regulation

1. Implement Stage 2 water shortage response measures, including a continuation of Stage 1 activities. The following are suggestions to customers:
   - No watering of any existing turf grass, ornamental plant, garden, landscaped area, tree, shrub or other plant except from a hand held hose or container or drip irrigation system.
   - No watering of new turf grass or replacement turf grass.
   - No initial filling of any swimming pool.
   - No automatic serving of drinking water at dining establishments except with patron request.
   - Curtailment of any use of water from a fire hydrant - except for fighting fires, Board-approved human consumption (hauling allowed to persons whose wells have gone dry), essential water quality flushing, and toxic clean-up purposes.
2. Drought Team Leader provides weekly updates on drought status to GFCSD Board.
3. GFCSD Board assesses the need to enact a drought surcharge.

Monitoring

1. Assess current drought stage bimonthly with current demand and supply information.
2. Consider potential future hydrologic conditions.
3. Monitor water demand weekly to assess water savings accomplished.

Public outreach

1. Accelerate community-oriented drought awareness with focus on community water use reduction goal and range of voluntary steps to accomplish savings.
2. Reinforce with customers the GFCSD Prohibition of Wasted Water and Stage 2 voluntary recommended water shortage response measures.
3. Customers who can conserve more are strongly encouraged to help customers who would incur economic hardship if they met the rationing goals.
4. Provide weekly updates to public on current drought stage.
5. Provide weekly updates to public on community demand response status.

Resource management

1. Weekly Drought Interagency Coordination Committee meetings to coordinate on monitoring, public outreach, current status, and opportunities for resource sharing.
2. Enact participation by Drought Advisory Committee members.

Drought Stage 3 Actions

The objective of Drought Stage 3 actions are to reduce water demand by up to 50 percent through effective and consistent public outreach, the enforcement of extensive restrictions on water use, and implementation of water rationing. Mandatory reductions of up to 50 percent are applied to each parcel's 300 gpd allotment. Protection of water supply for public health and safety purposes is the primary objective during Stage 3 drought conditions.

Policy and regulation

1. Implement Stage 3 water shortage response measures which includes enforcing Stage 1 and Stage 2 recommended water shortage response measures.
2. Drought Team Leader provides weekly updates on drought status to GFCSD Board.
3. GFCSD Board continues to assess the need to enact a drought surcharge.
4. GFCSD management to provide recommendation to the Board of Directors on increasing the frequency on residential meter reading to monthly for accelerated assessment of demand reduction.

Monitoring

1. Assess current drought stage bimonthly.
2. Consider potential future hydrologic conditions.
3. Monitor water demand (individual meter readings) weekly to assess water savings accomplished.

Public outreach

1. Accelerate community-oriented drought awareness with focus on community water use reduction goals, range of voluntary steps, and mandatory requirements to accomplish savings.
2. Reinforce with customers the GFCSD Prohibition of Wasted Water and Stage 3 mandatory water shortage response measures.
3. Provide weekly updates to public on current drought stage.
4. Provide weekly updates to public on community demand response status.
5. Implement procedure for customer reporting of wasted water.

Resource management

1. Weekly Drought Interagency Coordination Committee meetings to coordinate on monitoring, public outreach, current status, and opportunities for resource sharing.
2. Continue participation by Drought Advisory Committee members.
3. Consider coordinating and scheduling water hauling as needed.

1. INTRODUCTION

This document presents the Drought Plan for the Grizzly Flats Community Services District (GFCSD). This Drought Plan presents the actions and procedures for preparing for, identifying, and responding to a drought. The objective of the Drought Plan is to help GFCSD preserve essential public services and minimize the effects of a water shortage on public health and safety, economic activity, environmental resources, and individual lifestyle.

Drought occurs when precipitation over a season or longer is insufficient to meet the demands of human activities and the environment, resulting in water shortage conditions. Drought preparedness is an essential element of water supply planning.

This Drought Plan represents the results of the second phase of a two phase drought planning process. This introductory section presents the plan need and objectives, planning overview, drought history, climate change, GFCSD water supply and demand, GFCSD drought management policy, stakeholder involvement, drought planning approach, and plan content.

1.1 Plan Need and Objectives

Residents of El Dorado County generally depend on surface water from the watersheds of the Sierra Nevada mountain range for their water supply. The Sierra Nevada snowpack serves as natural storage for much of the region's annual precipitation. These watersheds experience large variations in annual precipitation and resulting water supply. This area has experienced significant droughts in the past. The possibility of climate change may increase the frequency and severity of drought. The population growth in El Dorado County and the resulting increase in water demand will amplify the severity of drought impacts. While the occurrence of droughts cannot be controlled, droughts and their impacts can be anticipated and planned for. A Drought Plan is needed to guide GFCSD to accomplish its mission of providing high quality water services in an environmentally and fiscally responsible manner during drought conditions.

This Drought Plan is intended to satisfy multiple objectives that consist of:

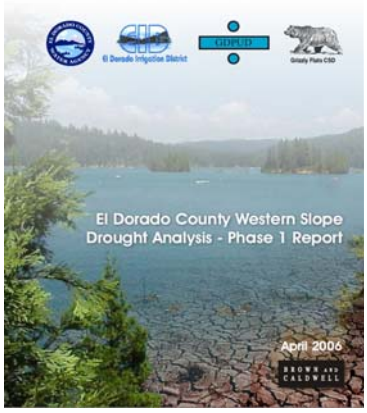
- Defining a common understanding of drought susceptibility, monitoring, communication, response, and opportunities for drought avoidance among each of the El Dorado County west slope water agencies.
- Updating GFCSD drought planning to incorporate new water supplies, most recent water demand projections, water conservation efforts, methods of public outreach, and potential impacts of climate change.
- Defining improved drought indicators and trigger levels that declare droughts accurately and early enough.
- Defining water demand curtailments that can reasonably be accomplished in drought conditions, are financially sustainable, administratively appropriate, and user-friendly, and will perform well for all customers and stakeholders.
- Providing a roadmap for Drought Plan implementation that focuses GFCSD's continuing efforts on activities that will monitor for the onset of drought, minimize drought impact on customers and GFCSD, and implement projects and other measures to reduce the need to declare drought.

This Drought Plan reflects GFCSD's most recent advances in drought planning.

1.2 El Dorado County Drought Planning Overview

In 2004, because of the need and value of drought planning and preparedness, the El Dorado County Water Agency (EDCWA), El Dorado Irrigation District (EID), GFCSD, and Georgetown Divide Public Utility District (GDPUD) initiated a drought planning process. The objective was to address the needs of residents on the western slope of El Dorado County (County) during drought conditions.

The drought planning process has been conducted in two phases. The drought planning has been conducted in a collaborative approach among drought plan stakeholders centered on a "shared vision" approach to drought analysis and planning. This approach helped the County water community develop an understanding of each agency's drought susceptibility and the actions that can be pursued individually and as a community to reduce or mitigate drought impact. The shared vision process is highlighted by the use of a user-friendly, transparent Shared Vision Model (SVM) that stakeholders use to develop an effective and equitable drought management program. A copy of the most recent SVM can be found on a CD in Appendix A. Phase 1 drought planning included the analysis of drought impacts in GFCSD and the western slope of the County, with focus on the potential to reduce drought impacts through demand management and supply augmentation actions.



The *El Dorado County Western Slope Drought Analysis – Phase 1 Report* (Brown and Caldwell, 2006) describes the development of the SVM and the results of the drought analysis. At the conclusion of Phase 1, drought stakeholders understood the current water supply reliability during drought for each of County's three western slope water purveyors based on current policy, water rights, and infrastructure. Additionally, drought stakeholders understood the needs, opportunities, and constraints facing each agency in the future as they implement policies, programs, and projects to mitigate or avoid drought impacts.

This Phase 2 drought planning effort focused on the development of individual drought plans for GFCSD, EDCWA, EID, and GDPUD. Drought plans include actions to improve drought management within the service area of each water agency, and also include actions from the shared vision process that encourage collaboration across the County western slope community to gain efficiency in drought monitoring, provide water for essential public health and safety, synthesize outreach activities, and integrate drought avoidance projects at the County level. Phase 2 also includes updates and improvements to the SVM based on stakeholder comment and requested additions.

1.3 Drought History

Founded in 1966, GFCSD has recently experienced drought periods in 1976-77 and 1987-92. Droughts also occurred in 1924, 1931-1934, 1939, and 1959-61. The paleoclimatic record indicates the occurrence of previous droughts of significantly greater severity and duration than these recent drought events. During the 1976-77 drought, the annual flow in the South Fork of the American River was 10 percent of the 1923-2003 average.

Historically, GFCSD has been able to react to drought through community support. The "This is my water district!" spirit with volunteers devoting their time and skills to help keep costs down has likewise helped GFCSD reduce demand during dry years. However, similar reductions in water use

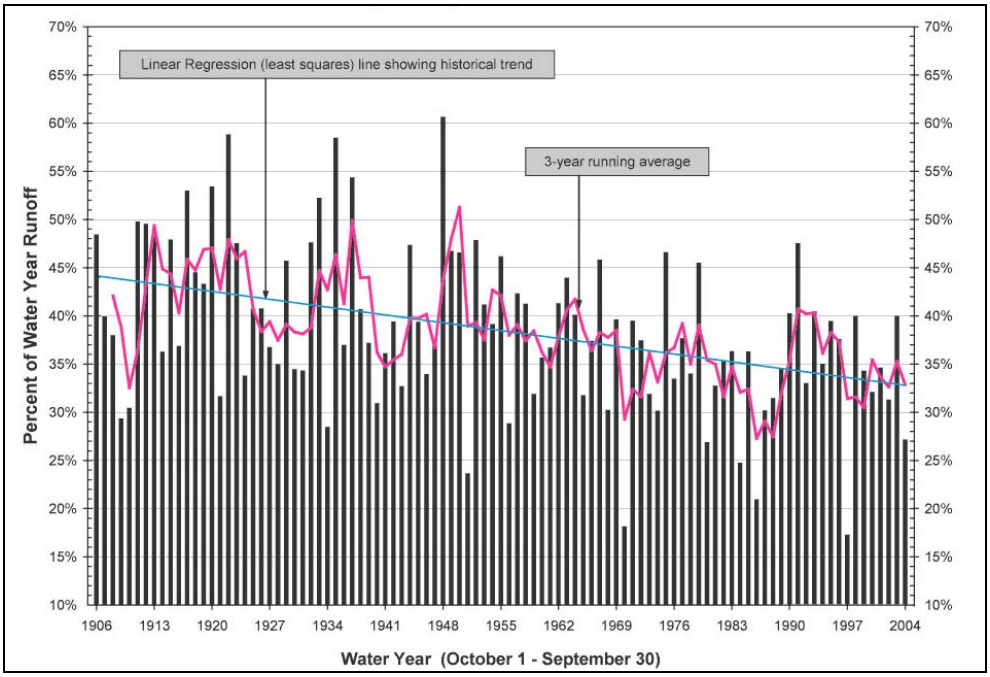
Picture courtesy of EID
Jenkinson Lake/Sly Park Reservoir 1977

during future drought may be more challenging as the GFCSD customer base increases and ongoing programs continue to improve water use efficiency. Additional detail of past droughts is provided in Section 2 of the Phase 1 Report.

1.4 Climate Change

Future climate change, caused by both naturally recurring cyclic patterns and human activities, may impact the intensity and duration of future droughts. As a result, future droughts may exhibit different characteristics than those observed during recent droughts. It is important to consider and plan for climate change because of the adverse effects of temperature and precipitation changes.

As an example, predictions are that average temperatures during the next 100 years will increase by approximately two degrees Celsius. Increasing average temperatures, resulting in earlier and heavier snowmelt runoff, will have greater affect on water purveyors reliant on surface water as compared with those reliant on groundwater. An existing trend of accelerated spring snowmelt and associated runoff in northern California is evidenced by late season (April – July) runoff in the Sacramento River as a percentage of total runoff for each year from 1906 to 2004 depicted in Figure 1-1.



Source: California Water Plan Update 2005 Volume 4 – Reference Guide

Figure 1-1. Sacramento River (April – July) Runoff in Percent of Water Year Runoff

Late season runoff constituted 44 percent of total runoff in the early 1900s, decreasing to 33 percent by the early 2000s. Developed surface water storage will reduce the impact of changing precipitation patterns on GFCSD supplies.

GFCSD recognizes the importance and potential implications of climate change to GFCSD and its customers. Development of the Shared Vision Model during Phase 1 includes four potential climate change scenarios that allow for an assessment of future supply reliability and potential shortages under changed climate conditions.

1.5 GFCSD Water Supply and Demand

The following subsections provide a brief summary of GFCSD water supply and demand. Understanding the flexibility and constraints associated with each source of water supply and demand is of primary importance when considering approaches to monitor and mitigate drought. Water supplies and demands were considered during drought plan development, both for current conditions and future conditions extending to year 2030. The SVM incorporates the current and future conditions of GFCSD water supply and demand as represented in the following subsections.

1.5.1 Water Supplies

As shown in Figure 1-2, GFCSD current water supply comes from two drainage areas. Big Canyon (1,715 acres) and North Canyon (1,120 acres) are surface water tributaries in the North Fork Consumnes River Basin. The two streams are fed by seasonal rainfall and snowmelt and also from a spring-fed system. GFCSD holds a pre-1914 water right for the direct diversion of available flows from Big Canyon and North Canyon at two points of diversion. Diversions flow into the Eagle Ditch up to the 800 gallon per minute (gpm) capacity of the pipe installed in the original earthen ditch so long as 15 percent of the flow is left in the stream. Typical flow in October, for example, is estimated at 620 gpm. In wet years, the capacity of the pipe often limits the amount of water that can be diverted. The watershed yield is 145 ac-ft based on the driest year on record.

Eagle ditch feeds the GFCSD reservoir. The full capacity of the reservoir is 25.99 ac-ft. However, it is reduced to 22.8 ac-ft when the overflow pipe is lowered 1.5 feet to reduce leakage losses from the unlined reservoir. In a normal year, GFCSD operates to maintain 6.1 ac-ft for fire-fighting and contingency reserve. Reservoir leakage and evaporation are consistent losses. Water is conveyed to the water treatment plant and then delivered into the distribution system for the Grizzly Park subdivision.

1.5.2 Water Demands

The past, current, and projected water demands for GFCSD are described in the Phase 1 report ,GFCSD's 1998 *Reconnaissance Investigation of Off-Stream Storage,* and EDCWA's April 2007 *Water Resources Development and Management Plan.* Legally, every parcel in GFCSD is allotted 300 gallons per day (gpd); this is a result of GFCSD having been built with bond money, so that each parcel picked up part of the water rights. GFCSD's year 2004 demands were approximately 164 ac-ft; year 2005 demands, 130 ac-ft. Projected demands for years 2010 and 2020 are approximately 278 ac-ft and 359 ac-ft, respectively. The annual rate of increase between years 2004 through 2010 is estimated to be approximately nine percent. GFCSD estimates that its demand will increase at an overall four percent annual rate through 2030, corresponding to a demand projection of approximately 440 ac-ft by the year 2030. Demand estimates include current conservation savings; reductions as a result of additional future water conservation efforts are not included in the demand projections. In this analysis, additional conservation efforts are included as a drought impact avoidance project alternative, and are further discussed in section 2.4.

NORTH

0 2.5 5

Scale in Miles

Lake Tahoe

Grizzly Flats

North Canyon

Big Canyon

Steely Fork Cosumnes River

Legend

Elevation (ft)

- 0 - 1000
- 1001 - 1250
- 1251 - 1500
- 1501 - 1750
- 1751 - 2000
- 2001 - 2250
- 2251 - 2500
- 2501 - 2750
- 2751 - 3000
- 3001 - 3500
- 3501 - 4000
- 4001 - 4500
- 4501 - 5000
- 5001 - 5500
- 5501 - 6000
- 6001 - 6500
- 6501 - 7000
- 7001 - 7500
- 7501 - 8000
- 8001 - 10860

Service Area Boundary

- El Dorado Irrigation District
- Georgetown Divide PUD
- Grizzly Flats CSD

Source: El Dorado County Water Agency, Water Resources Development and Management Plan, June 2003

SITE	Grizzly Flats Community Services District
TITLE	Service Area
BROWN AND CALDWELL	
PROJECT	130868
DATE	8-9-07
Figure	1-2

P:\30000\130868 EDCWA Phase II Drought Study\Graphics\GFCSD-Fig1-2-WaterSupplySys-wtopo.cdr

1.6 GFCSD Drought Management Policy

GFCSD has adopted policies and procedures to address drought conditions. Guidance provided in GFCSD policy and regulations is intended to reduce the potential for water supply shortfall and interruption of service. Furthermore, GFCSD may consider additional water shortage planning guidance by state and federal agencies. Subsection 1.6.1 discusses current applicable GFCSD policy, administrative regulations, and supporting documents. Subsection 1.6.2 provides an overview of water supply shortage guidance from regulatory agencies. Subsection 1.6.3 discusses the reliability of GFCSD's water system under its current drought policy. A timeline mapping the evolution of GFCSD's water supplies, demand management, and associated policies is depicted in Figure 1-3.

1.6.1 Existing GFCSD Policy and Procedures

Drought management at GFCSD is currently guided by their 1988 ordinance found in Appendix B. Detailed in this ordinance is GFCSD ongoing water waste policy and three water shortage emergency response stages. They are: Stage 1 Water Emergency Alert, Stage 2 Water Emergency, and Stage 3 Critical Water Emergency, with an associated 10-20, 20-30, and 30-50 percent demand reduction goal, respectively. Furthermore, the ordinance designates the Board of Directors responsible for calling a water shortage when the supply of water is deemed low or facility malfunctions require the additional conservation of water beyond normal daily conservation procedures.

1.6.2 Regulatory Guidance

As the Drought Plan was being developed, GFCSD considered required and suggested drought-related policy and guidelines provided by agencies with which GFCSD maintains either a collaborative or contractual relationship. These guidelines are outlined in more detail in Appendix C. At the county level, there are currently no drought management guiding policies; neither by the EDCWA or from the El Dorado County Environmental Management Department.

At the state level the California Office of Emergency Services (OES) guides GFCSD drought preparedness and management for GFSCD. The OES published a Water System Emergency Response Template in 1999 that includes a suggested Water Supply Interruption Action Plan consisting of four water use reduction stages including water alert with a 5 percent or greater water use reduction goal, water warning with a 15 percent or greater water use reduction goal, water crisis with a 30 percent of greater water use reduction goal, and water emergency with a 50 percent or greater water use reduction goal.

At the federal level the United States Army Corps of Engineers (USACE) developed guidance that was considered during development of GFCSD drought preparedness and management. In 1994, the USACE published a drought study that suggested that a drought response plan include triggers, forecasts, monitoring, enforcement, public affairs strategy, management measures, and a coordination mechanism.

SUPPLY

DEMAND MANAGEMENT AND CONSERVATION

DWR WATER YEAR TYPE

1850 1860 1870 1880 1890 1900 1910 1920 1930 1040 1950 1960 1970 1980 1990 2000 2010

POLICY AND PROGRAM

1850's - The community of Grizzly Flats founded. water rights established on stream flows from North Canyon and Big Canyon Creeks.

1966 - Grizzly Park Water Company formed.

1989 - Permits 20357 and 20358 were issued by the SWRCB. Permit 20357 authorized the District to divert water from an unnamed tributary to the Steely Fork of the Cosumnes River. Permit 20358 authorized GFCSD to divert water to storage from North Canyon and Big Canyon Creeks.

1987 - GFCSD was established by El Dorado County Board of Supervisors pursuant to Resolution 387-87. The formation of GFCSD involved acquired the water rights and facilities from the privately owned Grizzly Park Water Company.

1991 - GFCSD faced a water emergency when the U.S. Forest Service used treated water from one of the District's three closed storage tanks for a practice burn.

1994 -two wells drilled. One located near the water treatment plant yielded about 4 gallons per minute, which proved inadequate for a community water system. The second is located in the southwesterly portion of the service area at the Forest View water storage tank site to supplement the existing surface water supply.

DWR WATER YEAR TYPE
- Critically Dry
- Dry
- Below Normal
- Above Normal
- Wet

Sources: Borcalli & Associates Inc. Reconnaissance Investigation of Off-Stream Storage for the Grizzly Flats Community Services District. May 1998.
GFCSD

P:\30000\130868 EDCWA Phase II Drought Study\Graphics\GFCSD-Fig1-3-timeline.cdr

Figure 1-3. GFCSD Demand Management Measures and Supply Source Timeline

1.6.3 Water Supply Reliability Status

As part of the development of this Drought Plan, the reliability of GFCSD's water system was evaluated. For this analysis, reliability is defined as the volume of water supplied divided by volume demanded during the simulation period (historical or design drought) and expressed as a percentage. The demand volume is reduced from normal levels during dry periods within the simulation period when demand cutbacks of up to 30 percent are made. The analysis is described in detail in Section 2 of this report. The results are briefly described below.

The analysis results show that GFCSD's system reliability is 93.0 percent in 2004, decreasing to 73.3 percent with 2030 demands; values are based on no drought curtailment and the historical hydrology period of approximately 80 years. The reliability percentage would be less for the specific dry years embedded within the historical record. This analysis is based on the current amount of water supplies.

The analysis included a simulated 3-year drought that mimics the historical 1976-77 drought followed by a third year of 1977 hydrological conditions. The results show that the current system and plan would be 72.2 percent reliable for the three year period with 2004 demands, and 25 percent reliable with 2030 demands.

1.7 Stakeholder Involvement

Stakeholder participation, in accordance with the shared vision planning approach, was an important component of the project. The stakeholder team, consisting of GFCSD staff, Board members and customers, dedicated time and energy to developing this Drought Plan with analysis, input and review, as well as the extensive consideration of viable future drought monitoring efforts. With the recent media and political attention on climate change and the dry 2007 water year, both staff and the community have been focused on this drought plan development effort.

Considerable collaboration occurred during the plan development including the following:

- Initial meetings between the consultant and EDCWA to discuss regional drought analysis goals;
- A summary presentation at the El Dorado Water and Power Authority to familiarize regional stakeholders with the upcoming drought planning efforts;
- Several topic-oriented meetings with GFCSD board members and staff;
- A workshop to present and receive comment on the suggested approach to drought management; and
- A workshop to present and receive comment on the drought plan content

GFCSD Headquarters

Initial discussions with project stakeholders included the system's individual complexities, existing and potential drought indicators and triggers, current drought response plans, the coordination of drought management strategies within the region, and specific stakeholder drought management concerns. After these preliminary meetings, the participating stakeholders representing EDCWA, EID, GFCSD and GDPUD gathered in a workshop setting on December 20, 2006 to begin coordination between each individual's water purveyor's plans. On this

date, industry experts Jon Olaf Nelson and William Werick traveled to El Dorado County to present their expertise on community drought response and drought indicators, respectively.

These meetings not only provided the system details, purveyor perspectives, and community insights necessary to best address drought monitoring and response for GFCSD, but derived a level of support, coordination, and opportunities available to and from GFCSD with their neighboring water agencies. Significant consensus was reached on a number of topics including:

- 3 stages of drought declaration
- Methodology to evaluate drought indicators and triggers
- Development of drought response plan that promotes voluntary compliance

1.8 Drought Plan Approach

The approach to the development of the drought plan consisted of building off current policies and procedures, leveraging Phase 1 efforts, using the SVM, and incorporating GFCSD and EDCWA staff knowledge and input.

The development of the Drought Plan builds from existing policy and procedures and recognized past successes and lessons from previous drought periods. Phase 1 was completed as a collaborative County-wide effort to understand commonality across the water community while recognizing the individual strengths and challenges faced by each of the County's three west slope water agencies.

The SVM was developed to assess current and future water supply reliability and potential water supply shortfall during both drought and non-drought periods. The incorporation of climate change scenarios allows GFCSD to consider future water supply conditions under a changing climate. The SVM was used extensively during development of the Drought Plan, specifically to identify the best combination of drought indicators and drought trigger levels that maintain high system reliability accurately declaring a drought stage.

GFSCD and EDCWA board members and staff were instrumental in the development of the Drought Plan by representing GFCSD and customer preferences and providing institutional knowledge of GFCSD's policies, operational practices, and public outreach procedures. The 1) drought stages and associated target demand reduction, 2) approach to achieve needed customer response during drought, and 3) Drought Plan implementation actions reflect significant guidance and review from GFCSD staff and Board.

The Drought Plan and the associated SVM tool formalize and organize drought-related activities that GFCSD staff and Board will pursue as part of Drought Plan implementation. The Drought Plan is not intended to sit on the shelf and only be occasionally referenced for needed information. Section 3 of the Drought Plan outlines specific Plan implementation activities and the associated schedule for completion.

1.9 Drought Plan Content

The Drought Plan is organized into three sections as follows:

- Section 1 provides an overview of the need for drought planning, GFCSD water supply and demand with resulting water supply reliability, and policy and procedures guiding the development of the Drought Plan.
- Section 2 details the Drought Plan development process and results. Drought Plan elements include 1) drought stages with associated demand reduction targets, 2) drought indicators and triggers, 3) methods to achieve the desired customer response during drought, and 4) projects that can be pursued to reduce the frequency of drought declaration.

- Section 3 provides guidance on implementation of the Drought Plan. The implementation plan includes actions that are recommended for Board of Director consideration and a wide range of implementation actions to be completed during non-drought periods and under each stage of drought.

2. DROUGHT PLAN DEVELOPMENT

Section 2 provides details on the development of this Drought Plan's components including drought stage classification, drought indicators and trigger levels, GFCSD and community drought response, and long-term drought impact avoidance projects.

There are two primary goals in the development of this Drought Plan: (1) create an acceptable Drought Plan that meets demands in the driest conditions; and (2) determine if the current strategic mix of supply and demand drought management solutions will continue to be effective in the future. This evaluation focuses on the development of a drought plan that incorporates demand curtailments that can reasonably be met in drought conditions, is financially sustainable, is administratively appropriate and user-friendly, and will perform well for commercial, agricultural, environmental, and community interests (equity). The potential affects of climate change on drought conditions are also considered in this analysis.

In order to design a drought management strategy that is fair, understandable, a low administrative burden, and revenue neutral, several key plan elements were assessed:

- **Drought stages.** This refers to the escalating degrees of drought conditions that determine targeted percentages of customer demand reduction in order to avoid shortfalls. Water supply conditions were identified and corresponding drought stage defined.
- **Drought indicators and associated trigger levels.** Potential indicators include reservoir levels, precipitation, snowpack water content, etc. These were evaluated for a historical correlation with the occurrence of drought. Various trigger levels for specific indicators were tested and coordinated with a drought-stage-demand reductions in order to minimize water supply shortfalls.
- **Drought response measures.** This refers to various customer demand reduction actions in response to drought. Potential responses consider extensive customer water end-uses and water sources (potable, raw). The method of achieving effective water reductions (voluntary or mandatory), enforcement, and coordination with nearby water purveyors is also investigated.
- **Drought impact avoidance projects.** This refers to long-term projects (i.e. reservoir and additional water rights) which reduce the likelihood of future water supply shortages. Reliability based on the GFCSD historical record (1911-1987) as well as under a potential drier climate change scenario was calculated for various potential projects.

Balancing these plan elements was critical in the development of this drought plan and involved:

- declaring drought accurately,
- declaring drought early enough,
- minimizing how often drought needs to be declared;
- minimizing the duration of drought declaration; and
- a reasonable and equitable customer response (fair treatment of customers).

After defining drought stages and researching potential drought indicators, an iterative process was used to coordinate indicators, triggers, and customer demand reductions. Potential indicators were tested for historical correlations with drought. Concurrently, drought stage triggers and demand reductions were assigned to these indicators in order to minimize GFCSD water supply shortfalls. An iterative process refined when water supply shortages were likely to occur and how soon curtailment of demand would have to

start to be effective. "Indicators" based on historical correlations with drought are presented, and trigger levels for these indicators are defined. Trigger levels determine when a drought stages is declared. A balance between the indicators, triggers and response measures was critical to achieve water supply reliability. Section 2 summarizes the development of these elements.

2.1 Drought Stages

GFCSD's drought stages were defined by associating water supply conditions and demand reduction goals with drought stages. Drought stage definitions, as summarized in Table 2-1, were developed with input from a wide range of GFCSD and EDCWA board members and staff, including many of those responsible for managing public outreach and water supplies and demands during drought. The percent of water supply reduction anticipated for each stage, and the corresponding percent of targeted demand reduction, are the basis for determining the most reliable drought indicators and trigger levels as well as the most feasible customer response actions. The anticipated supply reductions are fifteen, thirty, and fifty percent, for drought Stage 1, Stage 2, and Stage 3, respectively. To maintain consistency with GFCSD's current drought plan as well as ensure an effective progression through drought stages (not too fast or too slow), three drought stages have been developed.

Table 2-1. Preliminary Drought Stage Definitions

Water supply conditions	Drought stage
Normal 0% Total Supply Reduction	None - Ongoing conservation measures; Prohibition of Wasted Water in effect.
Slightly Restricted Water Supplies Up to 15% Total Supply Reduction	Drought Stage 1
Moderately Restricted Water Supplies Up to 30% Total Supply Reduction	Drought Stage 2
Severely Restricted Water Supplies Up to 50% Total Supply Reduction	Drought Stage 3

2.2 Drought Indicators and Trigger Levels

Drought indicators and associated trigger levels function to declare a drought early enough to reduce water use, but not so early that false drought declarations are issued. False drought declarations can result in unnecessary revenue losses and compromised community faith in GFCSD. The best drought indicators for monitoring and assessing the onset and severity of drought are those with a strong correlation with actual GFCSD water supply conditions. Using the best drought indicators, multiple numeric trigger levels are defined that correlate to anticipated supply shortfalls (e.g. 15 percent, 30 percent, and 50 percent). Indicators and associated drought stage triggers coordinate with drought stage demand reduction actions to avoid water supply shortfall.

Using the SVM, three trigger plan scenarios are evaluated in this section based on resulting system reliability and percent time in drought:

1. No Plan/Current Plan – GFCSD has not previously documented drought indicators to assess the onset of drought, though historically, GFCSD has called drought and requested demand curtailment.
2. Experimental – considers GFCSD reservoir.
3. Supply Remaining Index (SRI) – most comprehensive trigger plan and more robust in considering the status of GFCSD supplies along with projected future supplies and demand.

Triggers are determined with the intention of being as straightforward and effective as possible.

2.2.1 No Plan/Current Plan

This approach represents GFCSD 1988-developed current water shortage response found in Appendix B. According to GFCSD Ordinance 88-1 water shortage policies are triggered "when the supply of water is deemed low or facility malfunctions require additional conservation of water beyond normal daily conservation procedures." No specific indicators or trigger policies are documented in GFSCD's current policies. To evaluate GFCSD's drought plan need, GFCSD's system reliability with no drought plan was measured. GFCSD's historical and projected system reliability is presented Appendix D. Calculated system reliability is shown in Appendix D for GFCSD's 1911-1987 historical record as well as under design drought 1976, 1977 and repeated 1977 dry year hydrological conditions. Because no gage records were available for the North Canyon and Big Canyon flows that are diverted into the reservoir, the SVM uses proportional flows from the North Fork of the Cosumnes River near El Dorado, CA (USGS Gage No. 11333500) in order to get a reasonable estimate of monthly supplies to the GFCSD system. Again, the "No plan/current plan" scenario assumes no drought plan or demand curtailment is enacted over the course of the historical record or design drought conditions since no indicators or triggers are in place.

ENSO Climate Cycles
(El Nino - Southern Oscillation)

The ENSO cycle refers to the coherent and sometimes very strong year-to-year variations in sea-surface temperatures, convective rainfall, surface air pressure, and atmospheric circulation that occur across the equatorial Pacific Ocean. El Niño and La Niña represent opposite extremes in the ENSO cycle.

El Niño refers to the above-average sea-surface temperatures that periodically develop across the east-central equatorial Pacific. It represents the warm phase of the ENSO cycle, and is sometimes referred to as a Pacific warm episode.

La Niña refers to the periodic cooling of sea-surface temperatures across the east-central equatorial Pacific. It represents the cold phase of the ENSO cycle, and is sometimes referred to as a Pacific cold episode.

The indicator considered for use in the drought response plan is a measure of *anomaly* - the difference between current sea surface temperatures and the 1971-2000 base period in the so-called 1Niño 3.4 region (5°N-5°South, 120°-170°West).

An ENSO index of less than zero means cooler than normal sea surface temperatures – a La Niña event. The droughts that began in 1976 and 1988 were preceded by La Niña.

El Niño and La Niña Seasons (historical years)	
El Niño - Weak to Moderate	57-58, 65-66, 77-78, 87-88, 92-93, 94-95, 02-03
El Niño - Strong	72-73, 82-83, 91-92, 97-98
La Niña - Weak to Moderate	50-51, 56-57, 64-65, 70-71, 71-72, 74-75, 98-99, 00-01
La Niña - Strong	55-56, 73-74, 75-76, 88-89

2.2.2 Experimental Trigger Plan

In developing the experimental trigger plan, the following indicators were evaluated: reservoir storage levels, DWR water year type, snow pack water content, precipitation, streamflows and ENSO climate cycle episodes (described in the information box). Specific indicator trigger values can reliably predict impending drought if developed from good statistical correlations, and if based on the historical database with a strong physical connection to water supply variability.

To determine the most reliable indicators for GFCSD, a computer model was created to identify correlations between projected SVM-derived GFCSD water supply shortfalls (with enacted drought response plan demand curtailment) and historical indicator data sets to see which indicators reliably predict drought. A monthly "shortfall" occurs when there is not enough water in storage (even with a given month's inflows) to meet monthly demand.

Ideally to avoid confusion, droughts would be declared for all water agencies in the region at the same time. However, since water agencies have varying potential for carryover storage and shortfalls are driven by varying demand and inflows to storage, the differing County water systems cannot realistically declare drought at the same time and therefore do not have identical indicators and triggers.

Selecting robust indicators and setting a trigger value for each drought stage to minimize supply shortages requires trial and error experimentation. This process was informed by an understanding of how the GFCSD physical water supply system works and a mathematical analysis of potential water shortfalls. Various indicator values were tested to determine indicator values for each stage that were "triggered" soon enough to warn for drought and late enough to correlate well with drought. Potential drought indicators and corresponding trigger levels were tested by comparing how accurately they predict drought over the entire hydrological record (1911-1987). Those that perform well predict drought during past GFCSD drought periods and do not predict drought during periods of no drought. For each indicator and trigger iteration, the number of true positives and false negatives (good) were compared to the number of false positives and true negatives (bad). The concept is further described in the adjacent information box, Indicator-Trigger Result Types.

Water Year Types

Sacramento Valley Water Year Index =

Sum of Sacramento River unimpaired flow above Bend Bridge, Feather River unimpaired inflow to Oroville Reservoir, Yuba River unimpaired flow at Smartville, and American River unimpaired inflow to Folsom Reservoir.

Sacramento Valley Water Year Index

= (0.4) x Current Apr-Jul runoff forecast (in million acre-feet) + (0.3) x Current Oct-Mar runoff (in million acre-feet) + (0.3) x Previous Water Year's Index.

This index, originally specified in the 1995 SWRCB Water Quality Control Plan, is used to determine the Sacramento Valley water-year type as implemented in SWRCB D-1641.

Year types are set by first of month forecasts beginning in February. Final determination is based on the May 1, 50 percent exceedance forecast.

Water years 1, 2, 3, 4, and 5 represent water years types wet, above normal, below normal, dry, and critically dry, respectively.

In determining the most reliable indicators, analyses included mathematical correlations and scatter diagrams to assess for possible relationships between indicator behavior and historical droughts. Individual historical dry year sequences were specifically examined to test if the indicators were truly identifying water supply shortages when there was actually drought. There is strong correlation between GFCSD's shortfalls and GFCSD reservoir levels, inflows, and DWR Water Year Type. On the other hand, for example, there was no consistent correlation found between GFCSD shortfalls (GFCSD drought) and snowpack water content or any regional precipitation gage data. The indicators and triggers successfully derived in the correlation model were iteratively built into the SVM to function with demand reductions to improve the reliability of GFCSD's system. GFCSD's reliability was tested based on GFCSD's historical record, however, system reliability under the design drought conditions (1976, 1977, 1977*repeated* hydrology) and varying climate change conditions was also analyzed. This was an iterative process between identifying reasonable triggers levels and achieving the most reliable system response. Both GFCSD's system reliability, the percent time GFCSD calls drought, and the amount of remaining shortfall were examined.

Indicator-Trigger Iteration Result Types

True positive (TP) – drought happens (true) and the trigger is pulled (positive).
False negative (FN) –no drought (false), and the trigger reads "no drought" (negative)

True negative (TN) – drought happens, but the indicator didn't trigger a warning.
False positive (FP) – no drought, but the indicator triggers drought and reduces demand unnecessarily.

From the indicator-trigger iterative process the best indicator for GFCSD was its own reservoir storage levels. GFCSD's experimental indicator and trigger plan includes the following:

1. Check GFCSD storage reservoir levels at the end of July.
2. If storage is less than 22 ac-ft, enter a Stage 1 drought
3. If the reservoir levels are below 20 ac-ft enter Stage 2 drought.
4. If the levels at the end of July or August are below 12 ac-ft, go directly into a Stage 3 drought.
5. For every subsequent month keep the August drought stage through November unless storage levels rise above 12 ac-ft
6. If the reservoir levels are above 12 ac-ft in August then reduce the drought stage by one stage each month until no drought is called.

The reliability of GFCSD's system with no drought plan and the experimental drought trigger plan scenarios is presented in Appendix D. GFCSD achieves an increase in system reliability with the experimental trigger plan.

2.2.3 Supply Remaining Index Trigger Plan

In wanting to create a more robust trigger plan, incorporating more indicators that could further increase GFCSD's system reliability, a more sophisticated drought trigger plan was developed considering the number of days of water supply remaining. When the number of days supply remaining (DSR) is low, there are not many days of water supply left and drought restrictions should be imposed to stretch the supplies longer. The DSR indicator incorporates expected future supplies and demand, and is calculated at the end of each month in the simulation. DSR is a function of:

- Current storage in GFCSD reservoir;
- Worst case expected supplies - conservatively based on the minimum monthly hydrology (reservoir inflows) in the historical record (1911-1987); and
- Normal (unconstrained) demand in the coming months - projected demand by month. In determining the reliability under these conditions, demand projections are based on a modeled demand year.

It is important to stress that DSR is not the expected number of days of supply remaining, since it considers the historically worst inflows rather than probable inflows. Using probable inflows would increase the estimate of days supply remaining. On the other hand, DSR does not reflect leakage or evaporation, which would slightly reduce the days supply remaining. DSR is a useful tool that predicts when the utility needs to reduce water demand.

To more accurately represent GFCSD's remaining water supply, a normalized days supply remaining index (SRI) was developed. SRI calculates the DSR remaining 20 months into the future, notes the month when supplies go negative (when shortfall occurs), and estimates the specific day that supplies go to zero. This SRI value represents the days supply remaining with a value between zero and one. For example, a monthly SRI value of zero indicates that the DSR is the lowest value in the entire historical record for that month. A SRI value of one means that the DSR is the highest possible DSR in the historical record for that month. For example, a SRI value of 0.5 means that the days supply remaining is halfway between the lowest DSR and the highest DSR for GFCSD's period of record. Figure 2-1 presents a flow chart of GFCSD's Drought Status SRI Trigger Plan. GFCSD's Drought Status SRI Trigger Plan also includes a subordinate indicator DWR Water Year Type (described in the information box). A real-time Drought Status SRI Model can be found on a CD in Appendix A.

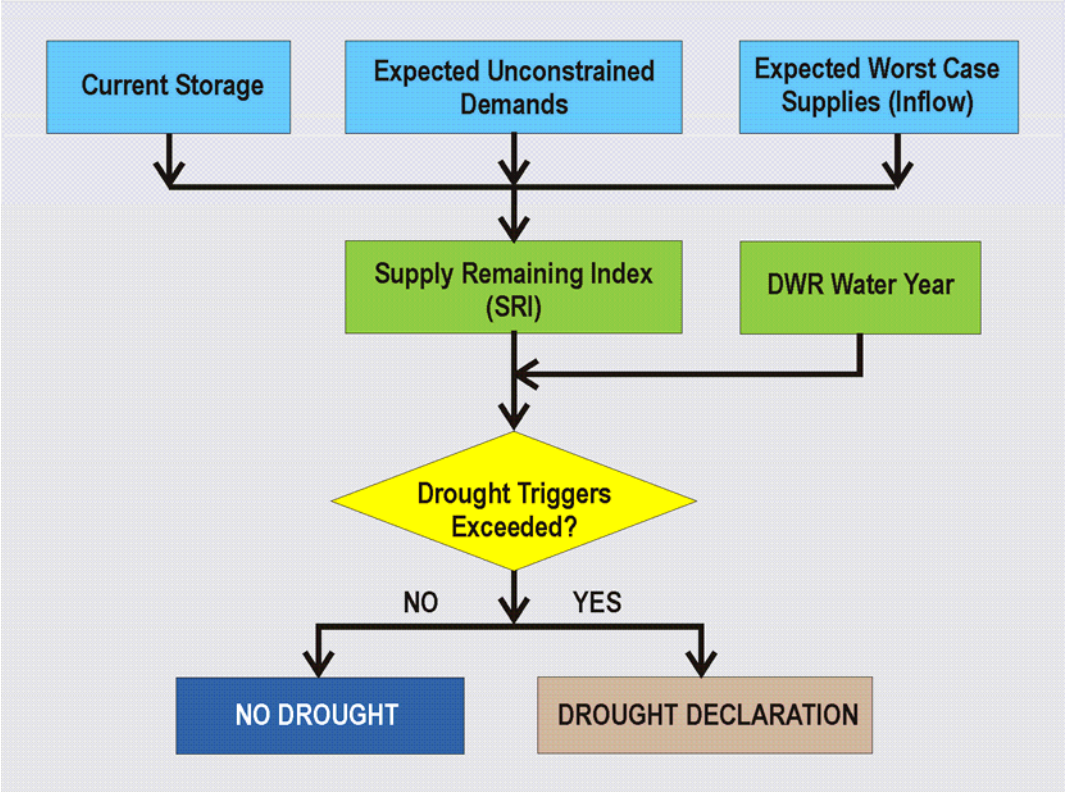


Figure 2-1. Drought Status SRI Trigger Plan Flow Chart

Input into the Drought Status SRI Model includes actual GFCSD reservoir levels and current drought stage status. There are links in the Drought Status SRI Model to DWR's website so the user can click and retrieve the most-recent water year type. The SRI model determines the date and then fetches the ENSO episode value from the National Oceanic & Atmospheric Administration (NOAA) Climate Prediction Center website, picking the appropriate values based on the date. Then the Drought Status SRI model evaluates this latest actual data to calculate the drought stage for the coming month. ENSO values can also be manually entered, as can all of the other currently "set" input parameters. These parameters include projected monthly demand and inflows, and drought stage SRI and DWR Water Year Type trigger values. Again, these indicators and trigger values were developed to optimize GFCSD system reliability based on the historical record. A screen shot from the Drought Status SRI Model is shown in Figure 2-2.

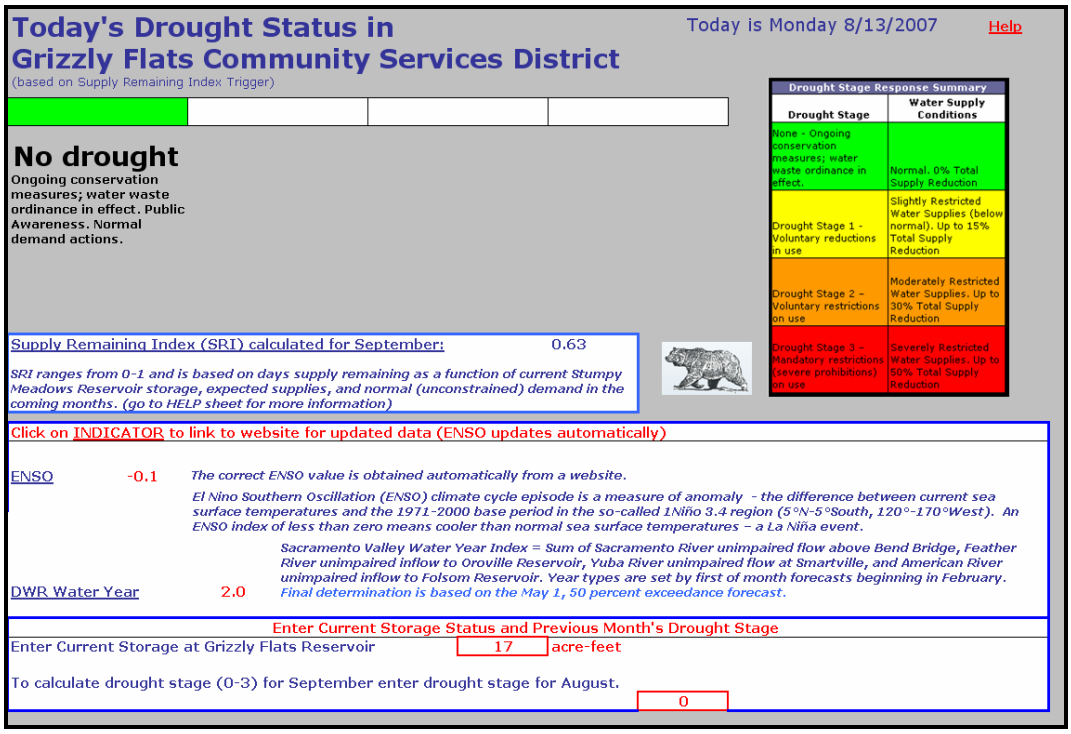


Figure 2-2. Drought Status SRI Model Dashboard Screen Shot

The GFCSD SRI trigger plan as a function of the number of days supply remaining and DWR Water Year Type is presented below and summarized in Table 2-2.

- If it's July and the water year type is a 4 or 5, go to Stage 1 or (if you are already in a drought) stay at the stage from the month before.
- In August through November, if SRI is less than 0.30 then go to Stage 2. If you were in Stage 3 last month, stay in stage 3.
- In August through November, if SRI is less than 0.10 and the previous month stage was 2, then go to Stage 3.
- If SRI is greater than 0.35 and the water year type is anything but 5 (critically dry), there is no drought curtailment. (This either continues a period of no drought or ends the drought response of the month before.)
- In all other cases, the drought stage this month is the same as last month.

Table 2-2. SRI Trigger Plan Summary Table

Month	DWR Water Year Type	SRI	Last month's stage	This month's stage
July	4 or 5	Any	0	1
		Any	1,2,3	Last month's stage
August - November	Any	< 0.3	0,1,2	2
			3	3
		< 0.1	0,1	Last month's stage
			2,3	3
Any	1,2,3,4	> 0.35	Any	0

Initially when calling a drought, indicator levels can only be triggered starting in July because GFCSD's reservoir is regularly full through June (according to the historic record). North Canyon and Big Canyon streamflows are adequate to fill GFCSD's existing reservoir through June so that their reservoir is always spilling; therefore requesting demand curtailments from the community is unnecessary before July. Since no local gages function accurately yet, DWR water year type and the general microclimate (snowpack and precipitation) can be used to indicate dusting off and reviewing the drought plans ahead of time.

SRI plan trigger values were selected by SVM-based optimization experimentation under 2010 demands and 2004 GFCSD operations to achieve maximum supply and delivery reliability while minimizing GFCSD's enactment of curtailment policy stages. A summarized comparison of GFCSD's reliability based on no drought plan, the experimental plan, and the SRI trigger plan is presented in Appendix D.

2.2.4 Trigger Plan Selection

As shown in Appendix D, the SRI trigger plan doesn't work best for GFCSD; the experimental plan does. Storage remaining is not a good indicator of whether GFCSD is about to go into drought. One month's demand in the summertime can be more than the volume of water in a full reservoir, so shortfalls can occur even if the reservoir is full if inflows that month are very low. SRI considers minimum future inflows, but in Grizzly Flats, that's zero in the summer, which means storage plus inflow is storage. These circumstances mean the reliability of the SRI plan is going to suffer. Alternatively, the reservoir can be low but there may be enough natural inflow to provide for all GFCSD demands. That is why the percent of drought declaration is so high using the SRI trigger plan in GFCSD. Drought is called when storage is low even if inflows are meeting demands. There are ways to revise the SRI trigger plan parameters so that it works as well as the experimental plan. The logic is that the experimental plan is based on storage, which for GFCSD is the same as storage plus no inflow, and time of year, which is a surrogate for demand. Until GFCSD records actual inflow data, the simpler experimental plan is a better fit for drought monitoring for GFCSD.

2.3 Drought Response

This section coordinates customer water end uses and drought policy enforcement methods by drought stage. Additionally, the necessity for drought plan compatibility between GFSCD and its neighboring water purveyors is addressed.

As summarized in Table 2-3, the drought response component of the Drought Plan involves an introductory Stage 1 drought response during which all customers are informed of drought and total customer demand reduction is targeted for 15 percent. At Stage 2, water use decisions continue to be entrusted to the customer as long as the overall reduction goal of 30 percent is met. This is a voluntary/honor system approach. In Stage 3 a strict allotment approach is implemented with a stiff penalty rate and a total demand reduction goal of 50 percent. This mandatory 50 percent reduction would be applied to each parcel's 300 gpd allotment.

The two response approaches, (1) a voluntary honor system based approach, and (2) a mandatory, prescriptive approach, each have advantages and challenges for achieving customer water use reduction. The voluntary approach, which depends on the honor system, focuses on educating customers on water use practices. This tactic relies on voluntary behavior modification to achieve targeted water use reduction. For example, a residential customer may choose to shower faster in order to water her tomatoes. The prescriptive approach requires a very encompassing list of managed water use activities that are mandatory and require enforcement.

Table 2-3. Drought Stage Response Summary			
Water supply conditions	Drought stage	Objective	Response actions
Normal 0% Total Supply Reduction	None - Ongoing conservation measures. Prohibition of Wasted Water in effect.	Public awareness	Normal actions
Slightly Restricted Water Supplies (below normal) Up to 15% Total Supply Reduction	Drought Stage 1 - Voluntary reductions in use	Initiate public awareness of predicted water shortage and encourage conservation	Encourage voluntary measures to decrease "normal" demand up to 15%
Moderately Restricted Water Supplies Up to 30% Total Supply Reduction	Drought Stage 2 – Increased voluntary restrictions on use	Increase public understanding of worsening water supply conditions, encourage voluntary conservation measures	Encourage voluntary measures to decrease "normal" demand up to 30%
Severely Restricted Water Supplies Up to 50% Total Supply Reduction	Drought Stage 3 – Mandatory restrictions (severe prohibitions) on use	Ensure that water use is limited to health and safety purposes	Enforce extensive restrictions on water use and implement water rationing to decrease demand up to 50% of 300 gpd/parcel allotment

A comprehensive set of prescriptive curtailment policy measures by customer class and drought stage for GFCSD can be found in Appendix E. The general response policies for each drought stages are listed below.

2.3.1 Stage Zero. Normal Conditions and Ongoing Conservation

When water supply conditions are normal with no reduction in water supplies, GFCSD is in a Stage zero drought. Under normal conditions, a Prohibition of Wasted Water will identify items of waste that are to be avoided at all times. A proposed Prohibition of Wasted Water for GFCSD can be found in Appendix F. Prohibitions include limited sidewalk washing, no car washing without a shutoff nozzle, and fixing leaks within 72 hours. Additionally, there are several early preparedness measures that will allow GFCSD to better handle drought:

- Trucking contracts
- Rate stabilization policies
- Communications plan
- Public outreach plan
- Institutional changes
- Legal changes
- Adjustment of plumbing codes to ensure use of more efficient equipment
- Efficient indoor plumbing fixtures

2.3.2 Stage One. Introductory

When GFCSD water supplies are slightly restricted, with a reduction in supply up to 15 percent, GFCSD is in a Stage 1 drought. In this introductory stage, customers are informed of drought conditions and of actions to take that will reduce demand. Furthermore, customers are asked to voluntarily reduce water use by 15 percent. This stage generally lasts only a month or two or the minimum time needed by GFCSD to adjust to the situation at hand. In this stage GFCSD should reacquaint customers with the Prohibition of Wasted Water. Though this stage is voluntary, specific guidelines for customers are listed below.

- Apply irrigation water only during the evening and early morning hours (8 PM to 6 AM) to reduce evaporation losses.
- Inspect all irrigation systems, repair leaks, and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray.
- Change the minutes of run-time for irrigation valves consistent with fluctuations in weather as determined by evapotranspiration data obtained by GFCSD or EDCWA.
- Reduce minutes of run-time for each irrigation valve if water run-off is occurring.
- Utilize water conservation incentive, rebate, and giveaway programs to replace high water-using plumbing fixtures and appliances with water efficient models.
- Take advantage of the free information available from GFCSD or EDCWA on how to use water efficiently, read a water meter, repair leaks, and irrigate efficiently.

Additional supplementary water wasting prohibitions may include:

- Do not refill a swimming pool that had been drained.
- Wash vehicles from a bucket. Use a hose equipped with a shutoff nozzle for a quick rinse (commercial car washes excepted).

2.3.3 Stage 2. Voluntary Reductions

When GFCSD water supplies are moderately restricted, with a reduction in supply up to 30 percent, drought Stage 2 with voluntary restrictions on use is enacted. The achievement of the reduction goal is measured by overall performance of the entire customer population, based on GFCSD production meters. In this stage, results are reported weekly to customers in the local paper or placed at conspicuous locations such as the post office. Customers are informed that individual meter records will not be audited or fees levied if the overall reduction goal is achieved. Furthermore, customers who can conserve more are strongly encouraged to help customers who would incur economic hardship if they met the reduction levels cited. The exceptions include having a drought hotline for reports of misuse of water or when an official spots and reports a misuse; the violation process will be implemented for the violating site. More specific guidelines are listed below with additional "non essential" uses.

- Curtailment of any use of water from a fire hydrant - except for fighting fires, Board-approved human consumption (hauling allowed to persons whose wells have gone dry), stock water, essential water quality, flushing, and toxic clean-up purposes.
- No watering of any existing turf grass, ornamental plant, garden, landscaped area, tree, shrub or other plant except from a hand held hose or container or drip irrigation system.
- No watering of new turf grass or replacement turf grass.
- No initial filling of any swimming pool.
- No automatic serving of drinking water at dining establishments except with patron request.

During Stage 2, it is assumed that customers will cooperate and unselfishly work together in harmony to successfully achieve the overall reduction goal. In the case of complaints or blatant non-compliance observed by water purveyor employees or other government officials, and brought to the attention of the designated official, enforcement will be pursued.

2.3.4 Stage 3. Mandatory Rationing

When GFCSD water supplies are severely restricted, with a reduction in supply up to 50 percent, drought Stage 3 is enacted and all Stage 1 and Stage 2 water shortage response measures become mandatory.

Mandatory reductions of up to 50 percent are applied to each parcel's 300 gpd allotment. Additionally, if the Stage 2 voluntary approach is not effective or becomes unfair to too many customers, then the Stage 3 mandatory drought response measures will be implemented. In the case of a very severe drought, GFCSD may announce that Stage 2 is an interim step to be followed by Stage 3 on a date certain. Stage 3 includes an allotment for each customer account with a penalty rate applied for all water used in excess of the allotment. Stage 3 is very expensive for the utility since an extraordinary amount of extra staff time and expense is required in the enforcement of demand reductions by individual account (parcel). Also, many variance requests can be expected and must be dealt with. Curtailment guidelines suggested in Drought Stage 1 and Drought Stage 2 are enforced.

2.4 Drought Impact Avoidance

The substantial impacts of drought can be more effectively avoided with long-term planning efforts including education, policy, and infrastructure-based mitigation measures. Initially investigated and developed in Phase 1 of this effort, several drought impact mitigation alternatives for GFCSD's water system were enhanced and refined in updating the SVM for this Phase 2 analysis.

The SVM simulates several drought impact avoidance projects that include both demand reduction and supply augmentation alternatives. These projects are included as toggles and incorporate relevant capacities, hydrology, and infrastructure constraints. Many of these alternatives were researched by the participating purveyors independently, and all were discussed in detail and recommendations provided at the Phase 1 Drought Advisory Committee workshops. The check boxes or drop down menus allow a user to compare various water agency "behavior" versus anticipated supply shortfalls.

Table 2-4 summarizes potential long-term reliability improvement projects (also referred to as drought mitigation and drought impact avoidance projects) for GFCSD.

Table 2-4. GFCSD Drought Impact Avoidance Project Alternatives

Project	Quantity
Activate existing well	14-50 gpm
Reduce leakage in existing reservoir	Depends on reservoir level
Off-stream storage alternative	350 ac-ft

GFCSD potential drought mitigation projects include activating an existing well, reducing leakage in their existing reservoir, and/or developing an off-stream storage reservoir. Details on these alternatives and the assumptions involved in their analysis as part of this effort are as follows:

Existing Well. GFCSD has an unpermitted small well with high iron and manganese levels. The well requires wellhead treatment, thus has not been pumped since 1998. Though designed to pump up to 50 gpm, historically the well has pumped at 14 gpm. This project's analysis assumes the well would pump at 14 gpm in any drought stages starting in July.

Reduce Leakage of Existing Reservoir. The SVM assumes that the lining of the reservoir would occur in the top three feet, measured down from the old spill pipe elevation that corresponds to a reservoir volume of 25.99 ac-ft. According to the 1998 Reconnaissance Investigation of Off-Stream Storage report, by lining the top three feet of the reservoir, leakage from this area would be reduced to 1.8 gpm, which is approximately a quarter acre-foot per month or 2.9 ac-ft/yr.

Off-stream Storage Reservoir. According to the GFCSD, an off-stream site adjacent to Big Canyon Creek could draw on the same source as the existing reservoir, adding an additional 350 ac-ft of storage. This is

modeled as an increase in storage capacity. The SVM assumes evaporation and leakage would occur at the site. The SVM uses a proportion of estimated leakage of 30 ac-ft per year at a full volume of 350 ac-ft, and since estimated evaporation is not reported, it is derived from estimates of the surface area, volume, depth, and side slope.

Since these drought impact mitigation alternatives are not currently being implemented, none have been included in developing the drought triggers and response policies that have been previously presented. As shown in Appendix D these projects either increase GFCSD's delivery reliability or decrease the number of times of drought is called and its duration, by varying degrees. Under cooler, drier climate conditions, these projects increase GFCSD reliability and drought is declared much more frequently. Background information on climate change factors can be found in the informational box. A screen shot from the SVM displaying GFCSD reliability under 2030 demands and worst-case climate change with the offstream storage reservoir and well alternatives is shown in Figure 2-3.

Climate Change Factors

Projections of future climate change points to changes in seasonal river flow patterns. This includes decreased amounts of water stored in snow pack, reductions in annual precipitation, and an increase in the extent and frequency of drought. In this study climate change scenario factors are used that represent the relationship between actual hydrology and four types of potential shifts in hydrologic runoff conditions. Based on regionally applied scenarios developed by Dr. Jay Lund, these are the same data sets used in the forecasting tools for the Department of Water Resources, Bulletin 160: California Water Plan and the California Energy Commission Climate Change Report. Dr. Lund's information for American River watershed inflows to Folsom Lake under four different scenarios is used to index the runoff hydrology to reflect the possible impact due to climate change. The four climate change scenarios are (1) Scenario A – HCM 2050, a warmer and wetter climate in year 2050, (2) Scenario B – PCM 2050, a cooler and drier climate by year 2050, (3) Scenario C – HCM 2100, a warmer and wetter climate by year 2100, and (4) Scenario D – PCM 2100, a cooler and drier climate year 2100. Scenario D represents the potential "worst case" climate change scenario. Most climate change models in California project a warming trend. Additional information on how these climate change scenarios are modeled in this analysis can be found in the Phase I report.

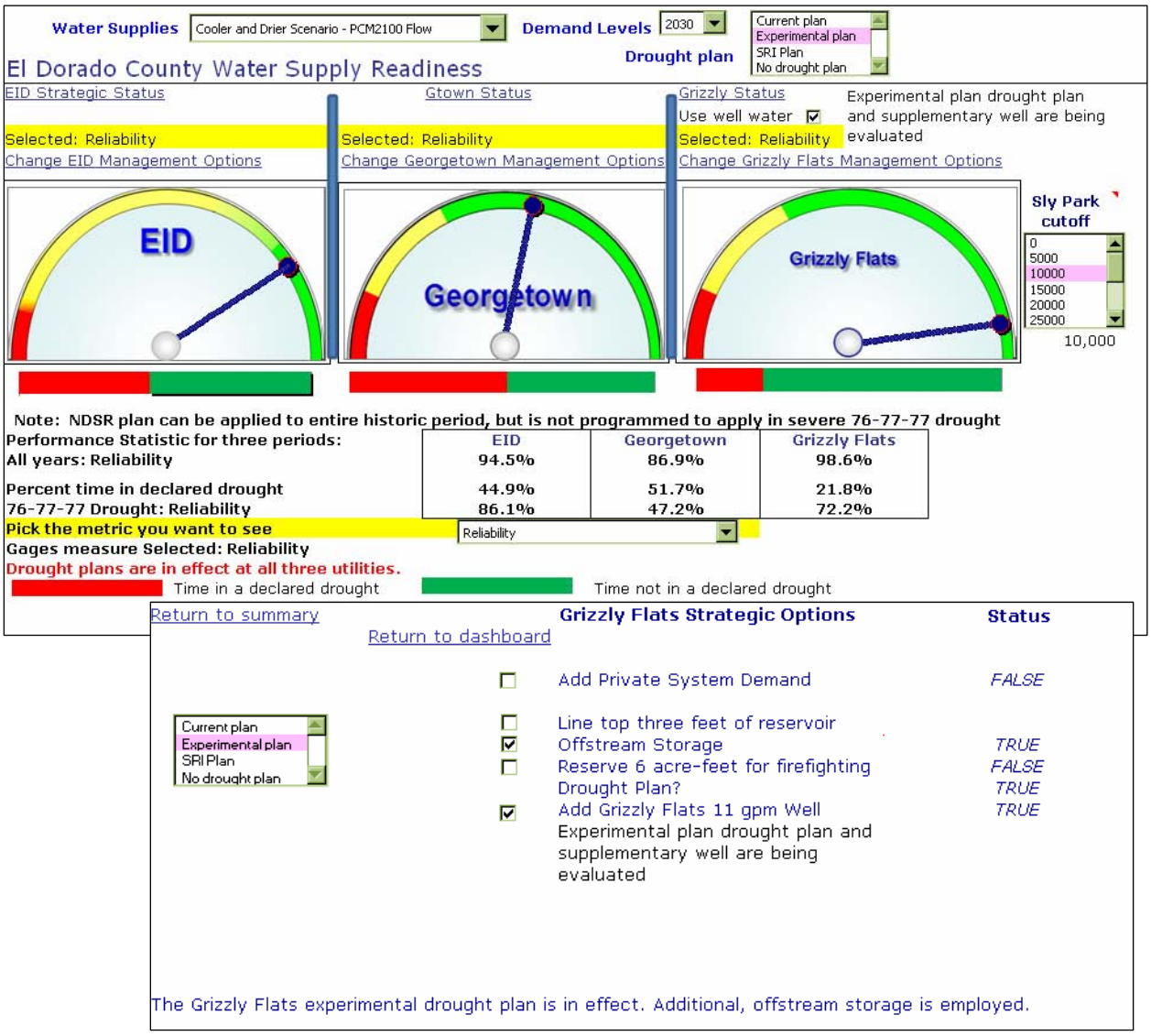


Figure 2-3. SVM Screen Shot of Regional 2030 Conditions with Worst –Case Cooler, Drier, Year 2100 Climate Change Scenario and GFCSD Drought Mitigation Projects: Well and Off-stream Storage Reservoir

3. DROUGHT PLAN IMPLEMENTATION

Section 3 provides guidance on the actions necessary for implementation of the Drought Plan. The implementation plan includes actions that are recommended for immediate Board of Directors consideration and implementation actions to be completed during both non-drought periods and during each stage of drought. Drought Plan implementation action items are grouped under the following headings:

- Public Information and Outreach
- Interagency Drought Coordination
- Reconciliation with Existing GFCSD Policy
- Initial Actions
- Ongoing Actions
- Drought Stage 1 Actions
- Drought Stage 2 Actions
- Drought Stage 3 Actions

3.1 Public Information and Outreach

Public information and outreach is an important element of the GFCSD Drought Plan because the customer response to drought will ultimately dictate the amount of water savings achieved. GFCSD staff and Board will lead public information and outreach efforts. Interaction with the public will require a two way dialog. GFCSD will share information and provide guidance to its customers. Of equal importance, GFCSD will need to monitor the customer response and attitude toward both voluntary and mandatory customer response guidelines.

GFCSD customer outreach is required to successfully achieve targeted water savings during each drought stage. As discussed in Section 2.3 (Drought Response), the drought team has recommended a drought response approach centered on voluntary compliance during drought Stage 1 and Stage 2, with mandatory restrictions implemented during Stage 3. GFCSD will need to effectively communicate information on drought stage, targeted water savings, and water saving guidelines that customers are expected to practice. Example materials to support public outreach are included in Appendix G.

Water savings guidelines for periods of non-drought and for each drought stage are included in Section 2.3 and Appendix E. Prior to drought stage declaration, GFCSD will pursue outreach to inform customers of drought stages and definitions, targeted water savings for each drought stage, guidelines that customers are to follow during each stage, and sources of current information on GFCSD drought status.

Water savings guidelines are predicated on being equitable across the various customer account types. Maintaining a sense of fairness will help achieve community participation. It is anticipated that customers will be provided various methods to communicate questions and provide comment.

3.2 Interagency Drought Coordination

An interagency organizational framework is needed to facilitate drought coordination. Figure 3-1 depicts the suggested interagency organizational structure. Participating agencies include El Dorado Irrigation District, El Dorado County Water Agency, Grizzly Flats Community Services District, and Georgetown Divide Public Utility District. The organizational structure includes the following representation:

- **Board of Directors:** Final decision-making authority rests with each participating agency's Board of Directors. Status reports will be provided to the Board of Directors through information provided by the Drought Team Leader. The Board of Directors for each agency is expected to provide guidance consistent with the needs of their customers while pursuing opportunities for interagency collaboration and resource sharing.
- **Drought Interagency Coordination Committee:** Committee members will include the designated Drought Team Leader from EID, EDCWA, GDPUD, and GFCSD. The Drought Interagency Coordination Committee is responsible for coordination activities for monitoring, public outreach, and resource sharing. The committee will also identify and recruit participation on a Drought Advisory Committee when needed. The EDCWA representative will serve as the leader of the Drought Interagency Coordination Committee.
- **Drought Team Leader:** Each participating agency will designate a Drought Team Leader. The Drought Team Leader will serve as the agency's liaison with the other agencies as a member of the Drought Interagency Coordination Committee. The team leader will also be the agency point-of-contact with Drought Advisory Committee members. The Drought Team Leader will also work closely with the GFCSD Board of Directors and staff.
- **Drought Advisory Committee:** The Drought Advisory Committee (DAC) will include representation from agencies and individuals whose input will promote efficient and coordinated drought management activities. The Drought Advisory Committee members will provide input and suggestions to the Drought Interagency Coordination Committee. Figure 3-1 includes the suggested membership for the DAC.

Interagency drought coordination will require varying levels of engagement dependant upon current drought conditions. The level of interaction will increase in parallel with increasing drought severity. However, preparatory and proactive coordination will continue even during periods of non-drought. Interagency coordination will center on:

- **Monitoring:** Interagency communication of drought indicator status will allow each agency to understand current conditions for other water purveyors.
- **Public outreach:** Interagency development of drought education tools plus collaboration on public education and awareness will provide efficiency and consistency across the county.
- **Resource sharing:** Interagency collaboration and coordination of resources which may include staff, grant funding, monitoring tools, infrastructure, water, and educational outreach tools will allow agencies to provide support to others in the community.

Figure 3-2 depicts the type and frequency of interagency coordination activities that will be pursued by the Drought Interagency Coordination Committee.

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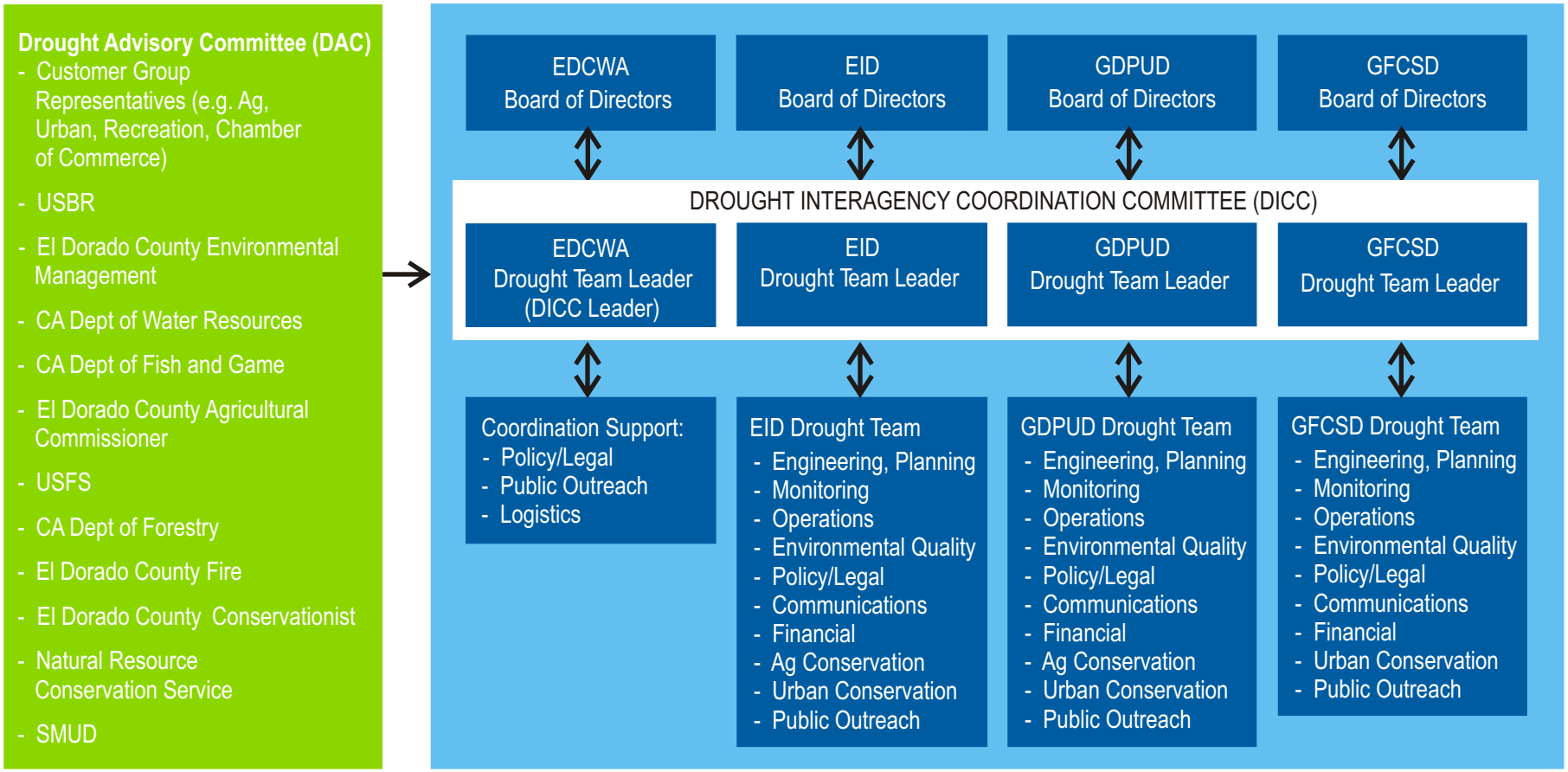

BROWN AND CALDWELL	PROJECT 130868	SITE Grizzly Flats Community Services District	Figure 3-1
	DATE 10-25-07	TITLE Drought Interagency Organizational Structure	

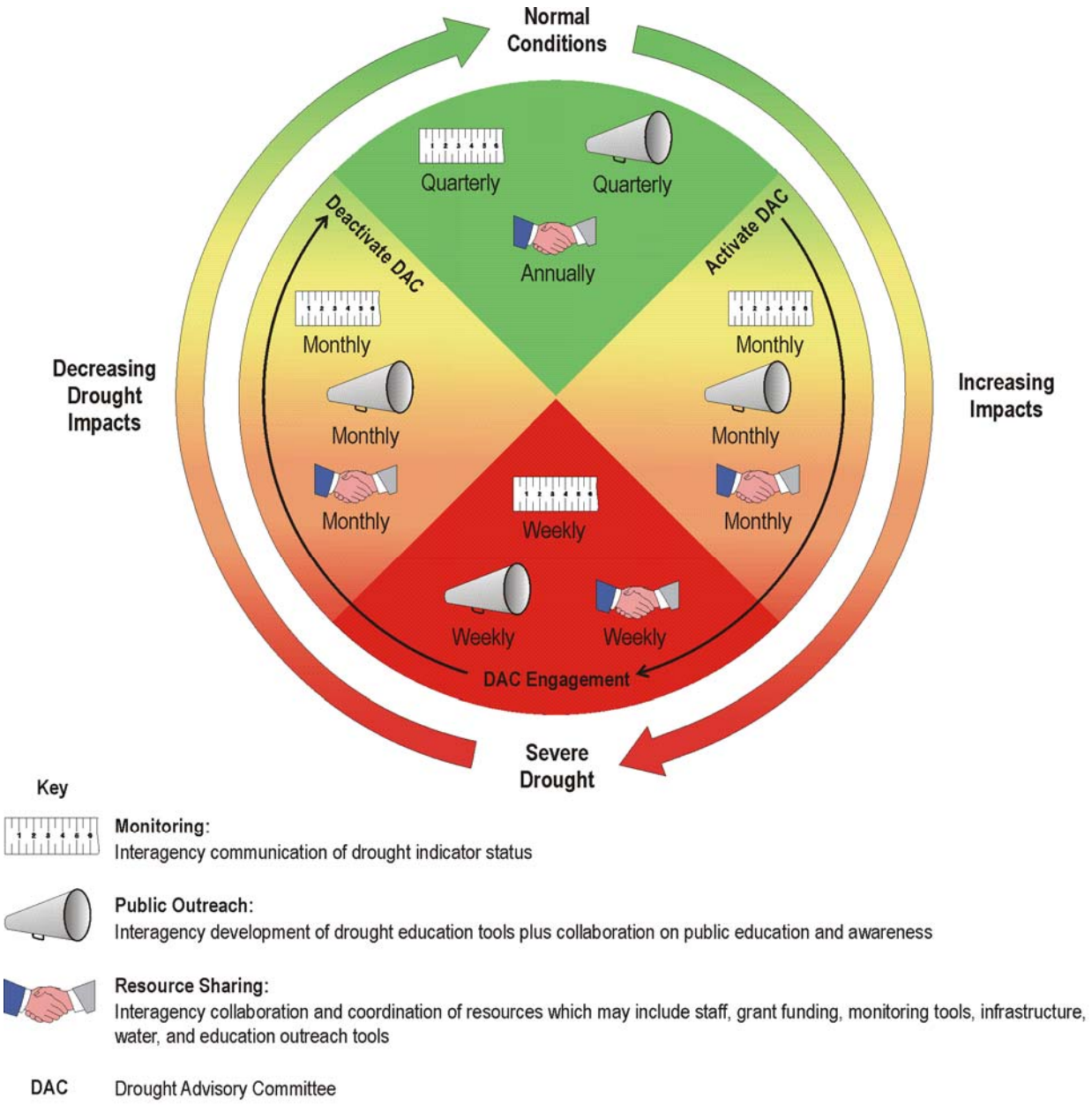

Figure 3-2. Drought Interagency Coordination Committee Activities

3.3 Reconciliation with Existing GFCSD Policy

Implementation action: Board consideration of updating existing Ordinance 88-1 Article 7.05 to gain consistency with Drought Plan elements.

Background: GFCSD Ordinance 88-01 includes a description of current water conservation and water shortage response measures under Article 7.05. Detailed in this ordinance is GFCSD ongoing water waste policy and three water shortage emergency response stages. They are: Stage 1 Water Emergency Alert, Stage 2 Water Emergency, and Stage 3 Critical Water Emergency, with an associated 10-20, 20-30, and 30-50 percent demand reduction goal, respectively. Furthermore, the ordinance designates the Board of Directors responsible for calling a water shortage when the supply of water is deemed low or facility malfunctions require the additional conservation of water beyond normal daily conservation procedures.

The Drought Plan content that differs from the current content of AR 5011 includes:

Drought stages: As described in Section 2.1, three drought stages are proposed. This is consistent with the current number of drought stages used by GFCSD, however, drought stage names and descriptions should be updated consistent with those shown in Table 3-1 below. The updated names will result in consistent use of drought stage terminology and definition among El Dorado County's west slope water agencies.

Drought indicators and triggers: As described in Section 2.2, an experimental trigger plan and Drought Status SRI Model (found in Appendix A) have been developed to provide drought indicators and associated triggers that indicate the onset and severity of drought. GFCSD should consider use of these tools to monitor the onset and advancement of drought conditions.

Drought stage response measures: As discussed in Section 2.3, demand reduction actions are coordinated with drought stage water supply conditions. Drought responses recognize the end uses of water, the method of achieving effective water reductions, and reduction policy enforcement methods. As shown in Table 3-1, the proposed 3-stages of water supply conditions include demand actions that focus on a voluntary, community-based effort during initial stages. Increased drought severity or inadequate customer response leads to mandatory restrictions. GFCSD Ordinance 88-01 drought response details will require updating to achieve consistency between this Drought Plan and the existing ordinance.

Table 3-1 Drought Stage Response Summary

Water supply conditions	Drought stage	Objective	Demand actions
Normal 0% Total Supply Reduction	None - Ongoing conservation measures; Prohibition of Wasted Water in effect.	Public awareness	Normal actions
Slightly Restricted Water Supplies (below normal) Up to 15% Total Supply Reduction	Drought Stage 1 - Voluntary reductions in use	Initiate public awareness of predicted water shortage and encourage conservation	Encourage voluntary measures to decrease "normal" demand up to 15%
Moderately Restricted Water Supplies Up to 30% Total Supply Reduction	Drought Stage 2 – Increased voluntary restrictions on use	Increase public understanding of worsening water supply conditions, encourage voluntary conservation measures	Encourage voluntary measures to decrease "normal" demand up to 30%
Severely Restricted Water Supplies Up to 50% Total Supply Reduction	Drought Stage 3 – Mandatory restrictions (severe prohibitions) on use	Ensure that water use is limited to health and safety purposes	Enforce extensive restrictions on water use and implement water rationing to decrease demand up to 50% of 300 gpd/parcel allotment

3.4 Initial Actions

Initial actions focus on beginning implementation of the Drought Plan. The objective of the initial actions is to complete the steps necessary to begin implementation of the Drought Plan. These actions are included in Table 3-2.

Table 3-2. Initial Drought Plan Implementation Actions

Policy and regulation	
1.	Board consideration of policy and regulation revision as described in Section 3.3. Incorporate into current 88-1 Ordinance
2.	Designate GFCSD Drought Team Leader
3.	Develop and adopt a Prohibition of Wasted Water to improve water use efficiency (see Appendix F for example)
Monitoring	
1.	Designate staff responsible for maintenance of drought plan and reporting of drought status
2.	Drought monitoring is initiated quarterly
3.	Designated staff gains necessary familiarity with selected drought monitoring tool
4.	Install and monitor additional stream gages (solicit USGS and DWR for support)
5.	Initiate interagency communication of drought indicator status
Public outreach	
1.	Communicate Drought Plan adoption with community
2.	Initiate education on Drought Plan content
3.	Coordinate with Drought Team Leader on use of selected drought status model to support public outreach
Resource management	
1.	Initiate interagency collaboration and coordination of resources through the Drought Interagency Coordination Committee (see Section 3.2)
2.	Pursue study on underground flows on Big Canyon diversion; investigate the feasibility of a drought curtain installation
3.	Pursue land trade for off-stream storage reservoir site
4.	Further consideration of Drought Advisory Committee drought management strategy comments (Appendix H)

3.5 Ongoing Actions

Ongoing Drought Plan implementation actions will be completed both during periods of non-drought and drought periods. These activities can be characterized as proactive actions that prepare for drought through monitoring, public outreach, and resource management practices. The ongoing implementation actions were developed by the drought plan team as described in Section 2.3. Ongoing activities are included in Table 3-3.

Table 3-3 Ongoing Drought Plan Implementation Actions	
Policy and regulation	
1.	Review and update Drought Plan every 5 years or as needed based on new gage data, new supplies, operational changes, or change in expected water demand
2.	Continue water loss management procedures (leak identification)
3.	Enforce Prohibition of Wasted Water to improve water conservation (see Appendix F)
4.	Continue conservation policies and support water-efficient plumbing codes
5.	Review and refine rate stabilization policy relating to drought impacts every 5 years
6.	Understand and comply with legal and regulatory requirements for drought management
Monitoring	
1.	Monitor experimental trigger plan quarterly to assess drought status
2.	Monitor system demands for consistency with planning assumptions
3.	Install and monitor additional stream gages (solicit USGS and DWR for support)
Public outreach	
1.	Develop and maintain drought awareness and public education materials, tools, and protocol
Resource management	
1.	Pursue drought impact avoidance activities including the development of additional water storage
2.	Pursue study of underground flows on Big Canyon diversion; investigate the feasibility of a drought curtain installation.
3.	Maintain interagency coordination annually
4.	Confirm and maintain commitment of Drought Advisory Committee members (see Figure 3-1)
5.	Consider establishing trucking contracts for water hauling (annually)
6.	Establish procedure by which residents within GFCSD on wells apply for emergency relief

3.6 Drought Stage 1 Actions

Drought Stage 1 actions are intended to initiate public awareness of predicted water shortage and encourage conservation. Stage 1 actions target a 15 percent demand reduction through implementation of voluntary measures. Stage 1 actions are described in Table 3-4.

Table 3-4. Drought Stage 1 Actions	
Policy and regulation	
1.	Implement Stage 1 water shortage response measures (see Section 2.3 and Appendix E)
2.	Drought Team Leader provides monthly updates on drought status to GFCSD management and Board
Monitoring	
1.	Assess current drought stage bimonthly using experimental trigger plan
2.	Consider potential future hydrologic conditions
3.	Monitor water demand monthly to assess water savings accomplished
Public outreach	
1.	Initiate community-oriented drought awareness with focus on community water use reduction goal and range of voluntary steps to accomplish savings
2.	Reacquaint customers with GFCSD's Prohibition of Wasted Water and Stage 1 recommended water shortage response measures
3.	Provide monthly updates to public on current drought stage
4.	Provide monthly updates to public on community demand response status
5.	Develop procedure for customer reporting of wasted water
Resource management	
1.	Monthly Drought Interagency Coordination Committee meetings
2.	Confirm commitment by Drought Advisory Committee members

3.7 Drought Stage 2 Actions

Drought Stage 2 action items are intended to increase public understanding of worsening water supply conditions and encourage voluntary conservation measures to decrease "normal" demand up to 30 percent. Stage 2 activities include a continuation of activities described above under the Stage 1 actions and Ongoing actions. Table 3-5 includes a description of Stage 2 actions.

Table 3-5. Drought Stage 2 Actions	
Policy and regulation	
1.	Implement Stage 2 water shortage response measures (see Section 2.3 and Appendix E), including a continuation of Stage 1 activities
2.	Drought Team Leader provides weekly updates on drought status to GFCSD Board
3.	GFCSD Board assesses the need to enact a water surcharge
Monitoring	
1.	Assess current drought stage bimonthly using experimental trigger plan
2.	Consider potential future hydrologic conditions
3.	Monitor water demand weekly to assess water savings accomplished

Table 3-5. Drought Stage 2 Actions	
Public outreach	
1.	Accelerate community-oriented drought awareness with focus on community water use reduction goal and range of voluntary steps to accomplish savings
2.	Reinforce with customers the GFCSD Prohibition of Wasted Water and Stage 2 voluntary recommended water shortage response measures
3.	Provide weekly updates to public on current drought stage
4.	Provide weekly updates to public on community demand response status
Resource management	
1.	Weekly Drought Interagency Coordination Committee meetings to coordinate on monitoring, public outreach, current status, and opportunities for resource sharing
2.	Enact participation by Drought Advisory Committee members

3.8 Drought Stage 3 Actions

The objective of Drought Stage 3 actions are to reduce water demand up to 50 percent through effective and consistent public outreach, the enforcement of extensive restrictions on water use, and implementation of water rationing. Protection of water supply for public health and safety purposes is the primary objective during Stage 3 drought conditions. Table 3-6 highlights Drought Stage 3 actions.

Table 3-6. Drought Stage 3 Actions	
Policy and regulation	
1.	Implement Stage 3 water shortage response measures (see Section 2.3 and Appendix E), including a continuation of Stage 1 and Stage 2 activities
2.	Drought Team Leader provides weekly updates on drought status to GFCSD Board
3.	GFCSD Board continues assessment of the need to enact a water surcharge
Monitoring	
1.	Assess current drought stage bimonthly using experimental trigger plan
2.	Consider potential future hydrologic conditions
3.	Monitor water demand (individual meter readings) weekly to assess water savings accomplished
Public outreach	
1.	Accelerate community-oriented drought awareness with focus on community water use reduction goal and range of voluntary steps and mandatory requirements to accomplish savings
2.	Reinforce with customers the GFCSD Prohibition of Wasted Water and Stage 3 mandatory water shortage response measures
3.	Provide weekly updates to public on current drought stage

Table 3-6. Drought Stage 3 Actions	
4.	Provide weekly updates to public on community demand response status
5.	Implement procedure for customer reporting of wasted water
Resource management	
1.	Weekly Drought Interagency Coordination Committee meetings to coordinate on monitoring, public outreach, current status, and opportunities for resource sharing
2.	Enact participation by Drought Advisory Committee members
3.	Consider coordinating and scheduling water hauling as needed

4. REFERENCES

Borcalli & Associates Inc. Reconnaissance Investigation of Off-Stream Storage for the Grizzly Flats Community Services District. May 1998.

Brown and Caldwell. El Dorado County Western Slope Drought Analysis - Phase 1 Report. April 2006.

DWR Water Plan Update 2005. Volume 4 – Reference Guide. 2005.

El Dorado County Water Agency. Draft Water Resources Development and Management Plan. June 2003.

El Dorado County Water Agency. Water Resources Development and Management Plan. April 2007.

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Grizzly Flats Community Services District. "Ordinance 88-1" Section 7-05 Water Conservation/ Water Shortage Response Measures. February 9, 1988.

Snow water content from California Department of Water Resources, Echo Summit Station in Placerville Ranger District http://cdec.water.ca.gov/cgi-progs/staMeta?station_id=ECS

APPENDIX A

Shared Vision Model

Drought Status Supply Remaining Index Model

Model Help Resources

See enclosed CD.

APPENDIX B

GFCSD Ordinance 88-1

GRIZZLY FLATS
COMMUNITY SERVICES DISTRICT

ORDINANCE 88-1

PASSED BY BOARD OF DIRECTORS
FEBRUARY 9, 1988

CURRENT REVISION August 18, 2004

Table of Contents Page

ARTICLE 1. GENERAL PROVISIONS

1-01. Purpose

This ordinance is intended to provide the Grizzly Flats Community Services District with a uniform and understandable guide to serving the community.

1-02. Rules and Regulations

Rules and Regulations concerning water and connection to and use of the water supply system and penalties for violations have been adopted for the benefit of the community.

1-03. Title

This ordinance know as "CONDITIONS FOR WATER SERVICE ORDINANCE No. 88-1" was first adopted September 1, 1988.

ARTICLE 2. CONDITIONS FOR WATER SERVICE

Ordinance 88-1 sets forth conditions for water service furnished by the Grizzly Flats Community Services District. It provides for:

a. Establishment of rules and regulations for water service and connections;
b. Collection of charges and for penalties and enforcement measures in case of nonpayment of charges or for violations;
c. Appeals;
d. Disposal of revenues;
e. Water conservation measures;
f. Effective date of Ordinance 88-1, as revised;
g. Procedure for amending Ordinance 88-1; and
h. Right of access by District representatives onto private property.

ARTICLE 3. DEFINITION OF TERMS

Terms used in Ordinance 88-1 are defined to provide consistency of usage within the District.

3-01. District

"District" is defined as the Grizzly Flats Community Services District, or the Board of Directors of the District or its duly authorized agents, employees and representatives.

3-02. Owner

"Owner" shall mean a non-subscriber of District water and the holder of record fee title of property within the District.

3-03. Tenant

"Tenant" shall mean a user of water supplied by the District who is a resident non-owner of property within the District and while not responsible for payment of statements, shall be obligated to comply with all other rules and regulations established by the District.

3-04. Customer

"Customer" shall mean a user of water supplied by the District and a holder of record fee title of property within the District, and who shall be directly liable for satisfying all obligations to the District as established by Ordinance 88-1.

3-05. Living Unit

"Living unit" shall mean any physical structure, permanent, portable or temporary for which any El Dorado County Ordinance shall require potable running water.

3-06. Water Supply System

"Water supply system" shall include everything necessary for the District to acquire, treat and distribute water from its natural source to and including the gate valve within the service connection to a customer's property.

3-07. Capital Connection Fee (CCF)

"Capital Connection Fee" is a per meter fee to all new construction within the district. It is placed in a separate ledger and is dedicated to capital improvements. This fee may be reviewed as often as necessary, but no less than annually. This fee will expire at the end of a 12 month period commencing on the date the "Application and Agreement for Water Service" was approved, if construction has not been started at the subjects site.

3-08. Standby Fee Charge

"Standby Fee" is a charge per parcel that is placed in the same ledger as above and dedicated to capital improvements, since those improvements also improve system

reliability to all users.

3-09. Private Water System

"Private water system" shall include but be not limited to wells (whether or not operative), water circulating solar systems, swimming pools, and other privately operated water systems which require backflow prevention in accordance with Grizzly Flats Community Services District's Ordinance 88-2.

3-10. Service Connection

"Service Connection" shall mean the junction of water supply system and the customer's supply line consisting of a pressure regulator, water flow meter, gate valve and associated fittings, all contained within a meter box. The customer's responsibility starts on the customer's side of the gate valve. The District shall have no obligation or responsibility for any injury or damage occurring, or maintenance or repair required from the service connection to any other location in or about the customer's property. This provision does not have any affect upon the District's right to compel a customer to repair, modify, remove, replace or otherwise maintain any aspect of the customer's private water system.

3-11. Service Connection Fee

"Service Connection Fee" shall mean the fee charged by the District to compensate it for its costs incurred in connecting an owner to the District water supply system, exclusive of any required hook-up fee. The service connection fee shall be set by the District, in it's sole discretion, in accordance with Article 4, Section 4-03. In the event that any individual service connection requires extra labor or materials, the District will impose an additional charge to that owner for those additional expenses.

3-12. Hook-up Fee

"Hook-up Fee" is a fee charged by the District to install all water lines and water mains necessary to enable the District to connect a parcel of property not within the former Grizzly Park Water Company boundaries to the District's water supply system. The hook-up fee shall be set by the District, in its sole discretion and shall be based upon an amount representing actual cost of any applicable government permits and similar expenses, labor and materials involved in installing such necessary water lines, mains, system improvements, and any charges or expenses as deemed necessary by the District. Once necessary water lines and mains have been installed, the customer shall, thereafter, be responsible for payment of applicable service connection fee before that parcel is connected to the District's water supply system.

3-13. Developer/subdivider

"Developer/subdivider" shall mean an owner of property within the District boundaries who applies to the county to subdivide a parcel into several lesser parcels.

3-14. Water Rate Charge

Except as required by the District, in its sole discretion, to prevent abuse and misuse of the District's water supply, or as specified in Section 7-05, water is provided at a

flat or metered rate per month cost.

3-15. Prorated Flat Charge

If applicable, water may, in the District's sole discretion, be provided at a per day cost.

3-16. Past Due Account

An account becomes past due if that account is not paid in full on the 15th day of the month. Payments postmarked after the 20th day will be past due.

3-17. Missed Payment Charge

Each time an account becomes past due, a missed payment charge shall be made to that account. The purpose of this charge is to recover reasonable administrative costs incurred in servicing that account. The late payment charge will be in the amount set forth in the Schedule of Charges (Exhibit 1), appended to Ordinance 88-1.

3-18. Late Charges

Once an account becomes past due, in addition to the missed payment charge, a late payment charge shall be made to that account. The late payment charge will be in the amount set forth in the Schedule of Charges (Exhibit 1), appended to Ordinance 88-1. The purpose of these charges is to compensate the District for the time value of money during the period that account remains unpaid.

3-19. Returned Check Charges

A charge shall be made to the account for checks returned unpaid in the amount set forth in the Schedule of Charges (Exhibit 1), appended to Ordinance 88-1. The purpose of this charge is to recover reasonable administrative costs incurred in servicing that account. Two or more checks returned in a 12 month period will require payment in cash or by money order, until such payment has been received the account will be treated as past due.

3-20. Appeals Board

a. Any customer of the District who disputes any fee or charge assessed by the District, or whose water service is disconnected by the District may appeal that action by filing a notice of appeal of that action no later than 30 days from the date that the District assessed the challenged fee or charge or disconnected water service to that customer.

b. Notice of appeal shall set forth the basis for the appeal and all facts upon which the appeal is based. No other basis or facts will be considered, except those specifically set forth.

c. Late appeals will be automatically rejected.

d. Applicable late charges will continue to accrue against any customer who has filed an appeal until the amount due is paid in full, or the District orders otherwise.

e. Water service not disconnected prior to an appeal shall not be disconnected until the Appeals Board rules on the appeal.

ARTICLE 4. SERVICE CONNECTIONS

4-01. Installation of Connection of Service

a. Each customer's living unit shall be required to have its own service connection. The customer shall be charged a separate service connection fee and CCF for each living unit on their parcel or parcels, regardless of the number of units on that parcel or parcels.

b. Except as otherwise directed by the District, the District shall be solely responsible for the installation of service connections to the District's water supply system. This installation, generally, will terminate at or about the property line (street right-of-way), as determined by the District. The water meter (service connection) box shall, at all times, remain accessible. Access to the service/meter box shall not be restricted by a fence, bushes or debris. The blue meter marker must remain in place and visible, marking the location of the meter. The water customer, in accepting service, accepts the responsibility for reasonable access for said meter, by any means.

c. When determined by the District to be in the best interest of the District, and/or the owner, the owner may be required to have the service connection installed by a licensed contractor in lieu of the District. All details of a service connection by a licensed contractor shall be approved, in advance, by the District before installation commences.

d. All parcels situated within the boundaries of the Grizzly Flats Community Services District, which are subdivided subsequent to this action, shall, in addition to the foregoing, be subject to all conditions as stated in Article 8.

e. Customer's ponds, swimming pools, and other high usage applications shall not be permitted except with prior approval of the District which approval will not be unreasonably withheld. Any such approvals will be subject to imposition of reasonable conditions by the District, and be subject to termination for failure to comply with those conditions, or for other reasonable cause, i.e., drought or other adverse or harmful conditions.

4-02. Unauthorized Work

No unauthorized person shall uncover, make connections to, alter or cause damage to the District's water supply system or its appurtenances or perform any work without prior approval from the District. Water can not be conveyed to any non-serviced lot or dwelling by any means such as hoses, pipes etc. Water service connections can only be installed by the Water District. Developers/Subdivider and customer's private water system operators shall be required to apply to the District for authorization to construct or modify a proposed or existing customer's private water system, which approval will not be unreasonably withheld.

4-03. Service Connection Fees

a. Service connection fees shall be set by the District, in its sole discretion, based upon the average cost of labor and material for installation of service connections during the prior calendar year. The District will publish this rate at the first Board meeting of each year. This rate shall be the base rate. Additional fees may be required for more complicated or time consuming installations.

b. The capital connection fee and the service connection fee is non-refundable.

c. The approval for or installed service connection for a specific parcel is transferable from seller to buyer of that same parcel with an authorization letter from the owner of said parcel. No other transfers will be permitted.

4-04. Request For Water Service

Applicants for water service connections shall bring their "Application for Building Permit", from the El Dorado County Building Department, to the District office for sign-off. The applicant must complete the application form and pay the capital connection fee and the service connection charge. The water service connection shall be made as soon as possible once the applicant shows proof of an issued permit from the El Dorado County Building Department. Upon completion of a service connection, the applicant will be charged the current monthly rate.

ARTICLE 5. WATER SERVICE CHARGES

5-01. Water Service Rate and Water Standby Fee

a. A metered rate, or flat rate if applicable, will be charged on all customer's living units whether occupied full time or part time. Commercial customers of the District shall be charged according to the District's contract with that customer. Non-commercial rates will be established by the Board of Directors on a published rate schedule that may be changed by the Board.

b. In addition, each owner shall be charged a monthly water standby or availability fee pursuant to California Government Code Section 61765.16 at a rate of up to $4.00 per parcel per month for each parcel owned by that owner and located within the District.

c. No water service and no facilities of the District water supply system shall be furnished to any user or to any person free of charge, discounted, or for exchange-in-kind except as specifically approved by the Board.

d. The District shall establish individual commercial rates, in its sole discretion, at the time of application for a commercial service connection.

e. The Pioneer Volunteer Fire Department shall not be charged for water.

5-02. Collection

Statements for water service shall be dated the first day of each month and shall be due on the 15th day thereafter. Payments post marked after the 20th day will be past due. The customer shall be responsible for keeping the District advised on the address to which statements are to be mailed, and failure of the customer to receive a billing statement shall not relieve the customer of payment obligation to the District.

5-03. Missed Payment Charges, Late Charges and Returned Check Charges

All delinquent accounts shall be subject to imposition of missed payment charges and late charges, as detailed in the Schedule of Charges (Exhibit 1), appended to Ordinance 88-1. Any returned check shall be subject to charges as detailed in the Schedule of Charges (Exhibit 1), appended to Ordinance 88-1.

5-04. Application

The District shall have the authority to establish any variances which the District deems necessary to alleviate any inequities which may arise upon application of this article.

5-05. Authorization

Ordinance 88-1 authorizes the District to impose, amend, restructure or eliminate its rates, charges and fees, including, but not be limited to, flat rate or metered charges, commercial rates, connection, disconnection and reconnection charges; missed payment and late charge penalties for violations of Ordinance 88-1

ARTICLE 6. PRIVATE WATER SYSTEMS

6-01. Prohibition of Connections

Properties, dwellings or structures with private water systems shall not be connected to the District water supply system without prior approval of the District, which approval will not be unreasonably withheld. In approving the connection of such private water systems, the District may, in its sole discretion, impose additional conditions, including but not limited to, District approved backflow prevention devices designed to prevent introduction of impurities into the District water supply system. The customer shall be responsible, at their sole expense, for compliance with all conditions imposed by the District.

6-02. Permit Required

Before commencement of construction of a private water system, the customer shall first obtain a permit from the District. The application for the permit shall be made on a form furnished by the District, which the applicant shall supplement with any plans, specifications, and other information deemed necessary by the District. A permit and inspection fee shall be paid to the District at the time the application is filed, in accordance with the provisions of Ordinance 88-1.

6-03. Design Requirements

The type, capacity, location and layout of customer's private water systems shall comply with all applicable requirements of the El Dorado County Health Department, the State of California, and all other governmental entities, and shall be subject to the approval of the District.

6-04. Cost of Maintenance by Customer

The customer shall operate and maintain the private water system in a sanitary manner at all times, at no expense to the District, and shall make the private water system available for inspection by the District on 24 hours notice by the District.

6-05. Solar Heating and Sprinkler Systems

Solar heating systems, irrigation or fire protection sprinkler systems, and/or non-District water storage tanks connected to the District facilities shall meet requirements of District Ordinance 88-2.

6-06. Additional Requirements

No statement contained in this article shall be construed to interfere with any additional requirements that may be imposed by any law, ordinance, rule or regulation administered by the State of California, the County of El Dorado or any other governmental entity.

ARTICLE 7. ADMINISTRATION AND ENFORCEMENT

7-01. Trespassing

Upon due timely notice to a customer, the District's agents, employees and representatives have the right to enter upon the property of a customer to inspect or perform work on the District water supply system or if a threat exists to the safety of the District's facilities, to inspect a customer's private water system or the customer's supply line located on private property. The District shall use that right with a diligent awareness of the customer's right to privacy, but if public health and safety is at risk, or some other emergency requires immediate access, the District will act with all necessary dispatch. Service to such property may be immediately terminated if public health and safety is determined to be at risk.

Each entry made under this subsection shall be brought to the attention of the District Board at its next public meeting.

7-02. Violations

Any customer, tenant, or other person or entity found to be in violation of any provision of Ordinance 88-1 or any other ordinance promulgated by the District, with exception of water charge delinquencies, will be served with a notice of violation by the District. The notice shall state the nature of the violation and provide a reasonable time for its satisfactory correction. The offender shall cease all violations within the period of time set forth in the notice, and shall make at their own expense, all necessary corrections.

7-03. District's Right to Disconnect Water Service

a. In the event that violation of Ordinance 88-1 or any other District Ordinance is not timely cured, or in the event that a water service charge is delinquent, the District may, in its sole discretion, and in addition to its right to impose missed payment fees, late fees, returned check fees and other applicable charges elect to disconnect water service to some or all of the parcels owned or rented by the violator. Prior to disconnecting water service, the District shall give the violator 10 days written notice (Exhibit 2), to the owner of: (i) violation of Ordinance 88-1 and (ii) to the Districts interest to disconnect the water service. The customer who has water service disconnected shall be liable for a disconnect fee in the amount set forth in the Schedule of Charges (Exhibit 1), appended to Ordinance 88-1.

b. The customer whose water service has been disconnected pursuant to Section 7-03.a. and who wishes to have such service reconnected shall be liable to the District for a reconnect fee in the amount set forth in the Schedule of Charges (Exhibit 1), appended to

Ordinance 88-1.

7-04. Public Nuisance, Abatement

During any period in which water service has been disconnected to a parcel of property pursuant to Section 7-03, habitation of the living unit thereon by human beings shall constitute a public nuisance, whereupon the District may cause proceedings to be brought for abatement of occupancy. In such event, and as a condition of reconnecting water service to that parcel, there shall be paid to the District a reasonable attorney's fee and the cost of suit arising from the action.

7-05. **WATER CONSERVATION/WATER SHORTAGE RESPONSE MEASURES**

a. The District shall encourage the public to practice and support water conservation at all times.

b. Customers are encouraged to retro-fit their residences with water saving plumbing devices.

c. To obtain the best use of water and prevent water loss through evaporation, the watering of lawns, gardens, landscape, and pasture irrigation shall occur only between the hours of 6:00 p.m. and 12:00 noon. Watering shall not exceed two (2) hours per water period per customer.

d. Drip irrigation systems are encouraged and are exempt from watering restriction, except when indicated. Drip systems shall observe the watering hours of 6:00 p.m. to 12:00 noon.

e. Washing of vehicles shall be done using a hose fitted with an automatic shutoff nozzle.

f. Citing and disconnect procedures for customers who, within a calendar year, fail to comply with water shortage response measures as defined under this section (7-05 A-G) shall be as follows:

First offense:	Written warning
Second offense:	$50.00 fine
Third offense:	$100.00 fine
Fourth offense:	Water shut-off

g. The District shall have three (3) Water Shortage Emergency Response Stages. They are: Stage 1 WATER EMERGENCY ALERT, Stage 2 WATER EMERGENCY and Stage 3 CRITICAL WATER EMERGENCY.

The Board of Directors shall call a Water Shortage Emergency when the supply of water is deemed low or facility malfunctions require the additional conservation of water beyond normal daily conservation procedures. A notice shall be posted in a public place and all customers shall be notified by telephone and or mail. For an emergency of long duration, all customers shall also be notified by first class mail. The notice shall contain reasons for the emergency, expected duration, and method for further notification as to the status of the emergency. Posting of a letter or notice shall constitute proper notification effective 24 hours after posting.

STAGE 1 WATER EMERGENCY ALERT

1. All of the above.

2. Customers are expected to conserve at 10% to 20% per average daily use.

3. Potable District water shall not be used for dust control, earthwork, or road construction.

4. A water patrol shall be initiated by the District to ensure compliance of emergency measures. It shall operate under the jurisdiction and direction of the Board and/or General Manager.

5. There shall be no washing of driveways, parking lots, decking, or other paved surfaces with GFCSD water unless for the purpose of renovation, construction or painting.

STAGE 2 WATER EMERGENCY

1. All of the above.

2. Customers are expected to conserve at 20% to 30% per average daily use.

3. New construction customers shall be allowed water only for operation of construction requirements. Watering for this use shall not exceed one (1) hour of consecutive use in a twenty-four hour period (i.e., concrete work, etc.).

4. There shall be no potable GFCSD water used for the planting of new gardens, lawns or landscaping.

5. Ponds, lakes, fountains, and swimming pools, shall not be filled with potable GFCSD water.

6. Lawns, gardens, landscaping, and pastures shall only be watered between the hours of 7:00 p.m. and 8:00 a.m. Watering shall not exceed one (1) hour per watering period per customer. Drip systems shall also observe the watering hours.

STAGE 3 CRITICAL WATER EMERGENCY

1. All of the above.

2. Customers are expected to conserve 30% to 50% per average daily use.

3. Water meter applications and water service connections shall be suspended in accordance with governmental regulations regarding Declaration of Water Shortage Emergency.

4. There shall be no outside watering. This includes lawns, gardens, landscaping, or irrigation of pastures and the washing of vehicles with potable water.

5. Drip irrigation systems <u>are not exempt</u> from a Stage 3 Critical Water Emergency.

7-06. Injunction

In addition to the District's right to disconnect water service, whenever a customer or a customer's property or private water system is in violation of provisions of Ordinance 88-1 or otherwise causes or threatens to cause a condition of contamination, pollution or nuisance, the District may petition the Superior Court for issuance of a temporary restraining order, preliminary and/or permanent injunction, as may be appropriate for the purpose of eliminating the cause of that violation.

7-08. Rewards for Information

The District may pay for information leading to the prosecution and conviction of vandals.

7-09. Damage to District Facilities and/or Water Supply System

Prior to any work performed that may cause damage to any District facilities, request shall be made for the District to indicate the location of any District facilities located in the area of proposed work. In the event that a customer, tenant, or authorized representative of a customer or tenant causes an obstruction, damage or any other impairment to any of the District facilities or the District's water supply system, without due care to have notified the District and to have allowed the District to indicate the location of its facilities and due caution has not been exercised by the customer, tenant, or authorized representative of a customer or tenant to protect the District facilities that have been indicated in the location, the District shall have the right to assess a charge against that customer for the reasonable cost to repair and restore the District's facilities and/or water system, and to add that charge to the customer's next billing statement or, alternatively, to separately bill the customer for those charges. In the event that such obstruction, damage or impairment is caused by someone who is not a customer, tenant or authorized representative of a customer or tenant, the District shall have the right to pursue all applicable remedies, civil or criminal, against that person, persons or entity. Such charges are to be made only if the work has been performed without due regard for the information provided by the District.

7-10. Appeals

Any applicant, permit holder, owner, customer or tenant affected by any decision, action or determination made by the District interpreting or implementing the provisions of Ordinance 88-1 may file a written complaint with the Secretary of the District within 30 days after the action. The Board shall make a final ruling on the appeal within 60 days from the filing of the complaint.

7-11. Civil Penalties

Any person or persons whose action violates any provision of Ordinance 88-1 and causes the District to deliver water which causes pollution, sickness or death or which violates any State of California directive, shall be liable civilly to a penalty of damage as established by the courts. The District, upon order of the Board of Directors, shall petition the Superior Court to seek to impose, assess and recover damages including all cost of the legal proceeding.

7-12. Severability

If any section, subsection, subdivision, paragraph, sentence, clause, or phrase of Ordinance 88-1, or any part of it, is for any reason held to be invalid, the decision shall not affect the validity of the remaining portions of Ordinance 88-1. The Board declares that it would have passed each section, subsection, paragraph, sentence, clause, or phase, irrespective of the fact that any one or more sections, subsections, paragraphs, sentences, clause, or phrase may be declared invalid. No statement contained in this Article shall be construed to interfere with any additional requirements that may be imposed by any law, ordinance rule or regulation administered by the State of California, County Health of El Dorado, or any other governmental entity.

7-13. Water Conservation Measures

In order to maximize the availability of water to all its customers and to reduce the likelihood of implementing water shortage response measures, the District has established the following requirements and recommendations for its customers:

a. New Construction

New Construction shall incorporate water conservation devices and fixtures such as low flow shower heads and ultra-low flow flushing toilets in compliance with state and county regulations. In addition, it is recommended that all outside landscape watering shall be accomplished by drip irrigation systems. Planting of lawns or other drought intolerant landscaping is strongly discouraged by the district.

b. Existing Residences

Homes which were built prior to regulations requiring low-flow fixtures are encouraged to replace these fixtures with those which comply with current state and county regulations. Also, installation of drip irrigation systems for outside watering is encouraged.

ARTICLE 8. DEVELOPERS/SUBDIVIDERS

8-01. General Policy

The District regards the overall present design of the District's water supply system as being critical to furnishing safe and high quality water to the community. Any alterations or extensions to the water supply system shall adhere to the same standards.

8-02. Intent to Subdivide

Developer/subdividers intending to subdivide any parcel within the boundaries of the District shall, at the time they submit such plan to the County of El Dorado, advise the District of their intention to have the District provide water service in that development and shall submit to the District a copy of that plan and or any other plan that would include a private water system in that development.

8-03. Developer/subdivider Costs

It is intended by the District that any developer/subdivider who intends to

subdivide property which is to be hooked up to the District's water supply system, be obligated to pay all necessary hook-up fees. Hook up fees shall be paid by the developer/subdivider in advance of commencement of work and the terms shall be mutually agreed to by the developer/subdivider and the District. If, however, the developer/subdivider does not request a hook up to the District's water supply system, each owner of a subdivided parcel desiring to hook up to that system shall be individually responsible for payment of a pro-rata share of the hook up fees, plus any additional fees of charges necessitated by the location of that particular parcel. Each parcel created within the District, as the result of the subdivision of a larger parcel, after the 1988-89 tax year shall be assessed pursuant to California Government Code Section 61765.16 and referred to in 5-01.(b) of Ordinance 88-1. and shall also be assessed pursuant to Measure "G" passed March 1, 1988 and implemented by the Grizzly Flats Community Services District Resolution No. 88-4.

8-04. Costs of Installation

The developer/subdivider shall bear all costs for installation of, and all inspections by the District, all material and labor for all necessary water mains, service connections and pumping stations, if required, within that development. The costs of installation shall include material and labor expended by the District for the extension of the existing District's water supply system necessary to reach that development.

Owners of parcels subdivided out of a larger parcel shall be jointly liable with the developer/subdivider for connection and hook-up fees in accordance with Section 3-09. in the event that the developer/subdivider fails to pay those costs.

8-05. Inspections

The District shall have the right to inspect all work at any time during normal working hours and shall perform scheduled inspections as follows:

a. preliminary plan review prior to start
b. at completion of system layout
c. at completion of excavations
d. at completion of installations
e. during pressure testing
f. during backfill

It shall be the responsibility of the party (or parties), performing the work to notify the District at least 24 hours prior to each of the foregoing stages of work.

8-06. Approvals

The District shall have the right to order the developer/subdivider to cease operations at any point if the work fails to meet the approval of the District.

APPENDIX C

Drought Stage Guidance Comparison Summary and Water Shortage Guidance Tables

Summarized Relevant Water Shortage and Drought Policies
for El Dorado County Water Agency and Grizzly Flats Community Services District

Agency	Current Policy																				
	GFCSD				El Dorado County Environmental Management Department	El Dorado County Water Agency (EDCWA)	Department of Water Resources (DWR)		California Office of Emergency Services	Governor's Advisory Drought Planning Panel					United States Bureau of Reclamation (USBR)							United States Army Corps of Engineers (USACE)
	Ongiong Water Conservation Programs	Stage 1: Water Emergency Alert	Stage 2: Water Emergency	Stage 3: Critical Water Emergency	(NOTE: Information gathering in progress.)	(NOTE: There are no current EDCWA drought policies.)	Urban Water Management Plan	Long-term drought preparedness planning	Water Supply Interruption Action Plan	Tier 1 Critical Water Shortage Reduction Marketing Program	Tier 2 Critical Water Shortage Reduction Marketing Program	Tier 3 Critical Water Shortage Reduction Marketing Program	Assistance to small water systems and homeowners in rural counties	Development of local agency Integrated Water Management Plans	Water Management Plan Guidelines	Ag and M&I Shortage Allocations	Develop a strategy	Stage 1 - Minimal	Stage 2 - Moderate	Stage 3 - Severe	Stage 4 - Critical	Drought Response Plan Development
EDCWA					S			S	S	S	S	S	S	S								S
GFCSD	R	R	R	R	S			S	S	S	S	S	S	S			S	S	S	S	S	S

KEY
R = Required
S= Suggested
= Not Applicable

Relevant Water Shortage and Drought Policies
for El Dorado County Water Agency and Grizzly Flats Community Services District

Agency	Current Policy	Current Procedure	
		Action	Schedule
PURVEYOR LEVEL			
GFCSD	Stage 1: Water Emergency Alert	Reduce average daily use by 10%-20%, no construction water usage, no dry-weather urban flows	
GFCSD	Stage 2: Water Emergency	Reduce average daily use by 20%-30%; no potable water used for new landscape or for ponds, fountains, and swimming pools; restricted plant watering	
GFCSD	Stage 3: Critical Water Emergency	Reduce average daily use by 30%-50%; water meter applications and connections suspended; no outside watering	
COUNTY LEVEL			
El Dorado County Environmental Management Department	(NOTE: Information gathering in progress.)	(NOTE: Spoke with Greg Stanton at El Dorado County Environmental Management Department on 08/15/06. Before providing information on County policies/regulations, Greg would like to discuss with his staff.)	
El Dorado County Water Agency (EDCWA)	(NOTE: There are no current EDCWA drought policies.)		

Relevant Water Shortage and Drought Policies
for El Dorado County Water Agency and Grizzly Flats Community Services District

Agency	Current Policy	Current Procedure	
		Action	Schedule
STATE LEVEL			
Department of Water Resources (DWR)	Urban Water Management Plan	Include a water shortage contingency analysis in UWMPs and include each of the following elements: (a) Stages of action (including up to a 50% water supply reduction) and an outline of specific water supply conditions for each stage. (b) Estimate of the min. water supply available during each of the next 3 water years based on the driest 3-year historic sequence. (c) Actions to prepare for and implement during a catastrophic interruption of water supplies. (d) Mandatory prohibitions against specific water use practices during water shortages. (e) Consumption reduction methods in the most restrictive stages. (f) Penalties or charges for excessive use, where applicable. (g) Analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures, and proposed measures to overcome those impacts. (h) Draft water shortage contingency resolution or ordinance. (i) Mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	Every five years
DWR	Long-term drought preparedness planning	1) Seek additional funding or partnerships to support DWR's basic water measurement programs 2) Update and publish DWR's water well standards 3) Develop a fact sheet and web page to ID county agencies administering well standards 4) Closely review shortage contingency elements of UWMPs 5) Develop an internal database-backed website for extracting information from UWMPs 6) Continue efforts to site more CIMIS weather stations in urban areas 7) Survey some of CA's larger urban areas to determine the extent to which the Model Water Efficient Landscape Ordinance is being implemented. 8) Identify and fund research in the areas of long-range weather forecasting, global climate change, and paleoclimatology	1) January of first water year: Submit funding request in Governor's May budget revision for drought water bank in the programmatic EIR and for placing additional mobile irrigation management labs in the field 2) Spring of first water year: Promote CIMIS through workshops and media outreach, and begin developing fact sheets and related information to respond to public and news media inquiries 3) Summer of first water year: Begin holding public workshops on well construction fundamentals and the DWR's well standards, targeting rural counties with large numbers of individual residences on wells 4) Near start of second water year: (a) Evaluate water supply and triggers. (b) If warranted, begin enhanced education and outreach program. (c) Evaluate staff resources available for procesing water bank contracts and contracts for other wheeling of non-SWP water. (d) Evaluate need for any new legislation to address drought-related conditions.
California Office of Emergency Services	Water Supply Interruption Action Plan	1) Normal Conditions: No water use reduction needed. 2) Water Alert: A 5% or greater reduction in water usage. 3) Water Warning: A 15% or greater reduction in water usage. 4) Water Crisis: A 30% or greater reduction in water usage. 5) Water Emergency: A 50% or greater reduction in water usage.	
Governor's Advisory Drought Planning Panel	Tier 1 Critical Water Shortage Reduction Marketing Program	**Water Shortage Preparedness:** Implement water use efficiency measures, develop local facilities to enable water transfers, and develop local groundwater management programs. Develop guidelines/criteria/action plans to prepare for Tier 2 and 3 occurrences. Begin a reserve fund to cover participation in the program.	CALFED Stage 1
Governor's Advisory Drought Planning Panel	Tier 2 Critical Water Shortage Reduction Marketing Program	**Purchasing Options and Allocating Water:** Make a declaration of probable impending critical water shortages absent a program purchase and demonstrate that resources are being maximized to purchase water	
Governor's Advisory Drought Planning Panel	Tier 3 Critical Water Shortage Reduction Marketing Program	**Water Shortage Emergency:** Coordinate with State regarding financial assistance for emergency water acquisitions, including water hauling, pipeline construction, or well drilling.	
Governor's Advisory Drought Planning Panel	Assistance to small water systems and homeowners in rural counties	Proposed State-funded DWR-developed program component: Development of a technical assistance/education program targeted to rural home-owners and small domestic water systems relying on self-supplied groundwater, to be implemented in consultation with rural county environmental health departments, including series of workshops designed to educate homeowners with private wells about well construction and maintenance fundamentals. Development of a website containing information on State and County well construction requirements, sources of groundwater level and well yield data, and State and County contacts for obtaining additional information.	Proposed State-funded DWR-developed program component: At time of Governor proposal and subsequent Legislature approval
Governor's Advisory Drought Planning Panel	Development of local agency Integrated Water Management Plans	Proposed DWR/other CALFED agencies-funded program: DWR/other CALFED agencies to work in partnership with local water agencies to assist them in developing plans to facilitate integrated management of supplies for agricultural, urban, and environmental purposes.	Proposed DWR/other CALFED agencies-funded program: At time of DWR allocation of funds (at least $2 million per year) to support proposed program.

Relevant Water Shortage and Drought Policies
for El Dorado County Water Agency and Grizzly Flats Community Services District

Agency	Current Policy	Current Procedure	
		Action	Schedule
FEDERAL LEVEL			
United States Bureau of Reclamation (USBR)	Water Management Plan Guidelines	Attach to the USBR Water Management Plan a copy of the agricultural and/or urban water shortage policies, drought plan, or any similar document. Describe how reduced water supplies, including hardship water, are allocated. Describe the policies that address wasteful use of water and describe enforcement methods.	
USBR	Ag and M&I Shortage Allocations	**M&I Shortage Policy - Central Valley Project:** 1) Decrease ag water supplies to 75% of contractual water supply before M&I water supplies begin taking shortages. 2) Then ag and M&I shortages rachet down % by % until M&I water reaches 75% of its historic use and ag water is at 50% of its contractual water supply. 3) When the M&I's 75% reliability sets in, M&I will remain at 75% of its historic use, and reduce ag water until ag supplies reach 25% of their contract water supply. Evaluate CVP water supply availability, public health and safety levels, hardship water for agricultural demands, etc. 4) When ag water supplies are reduced to 25%, further reduce M&I water supplies.	
USBR	Develop a strategy	**Preparing for, minimizing, and responding to water shortages:** 1) Establish triggers for a water shortage response plan and actions to be taken before and during a water shortage. Balance supply and demand. 2) Develop a water shortage strategy with stages, select appropriate drought mitigation measures, match water shortage mitigation actions to strategy stages (i.e., supply augmentation methods, demand reduction methods, 3) When a water shortage is imminent, implement strategy: evaluate water saved by staged reductions and select stage 4) Monitor production and use 5) Implement public outreach strategy and involve the media 6) Analyze revenue and expenditure impacts	
USBR	Stage 1 - Minimal	Voluntary reductions to decrease "normal" demand by 5-10%.	
USBR	Stage 2 - Moderate	Some mandatory measures.	15-25% Total Supply Reduction
USBR	Stage 3 - Severe	Water rationing.	25-35% Total Supply Reduction
USBR	Stage 4 - Critical	Water rationing and extensive restrictions on water use to decrease demand by 50% of the "normal" demand.	35-50% Total Supply Reduction
United States Army Corps of Engineers (USACE)	Drought Response Plan Development	Include in Drought Response Plan the following elements: 1) Triggers 2) Forecasts 3) Monitoring 4) Enforcement 5) Public affairs strategy 6) Management measures 7) Coordination mechanism	

APPENDIX D

GFCSD Reliability

GFSCD Reliability – No Drought Response

Table 1. GFCSD Reliability with no drought response		
Year	Historical conditions (1911-1987)	Design drought conditions (1976-1977-1977*repeated* hydrology)
2004	93.0 %	72.2 %
2010	84.6 %	33.3 %
2020	79.0 %	30.6 %
2030	73.3 %	25 %

Notes:
1. Based on SVM 080807 version.
2. Assumes no well use.
3. Assumes zero water reserved for fire fighting.

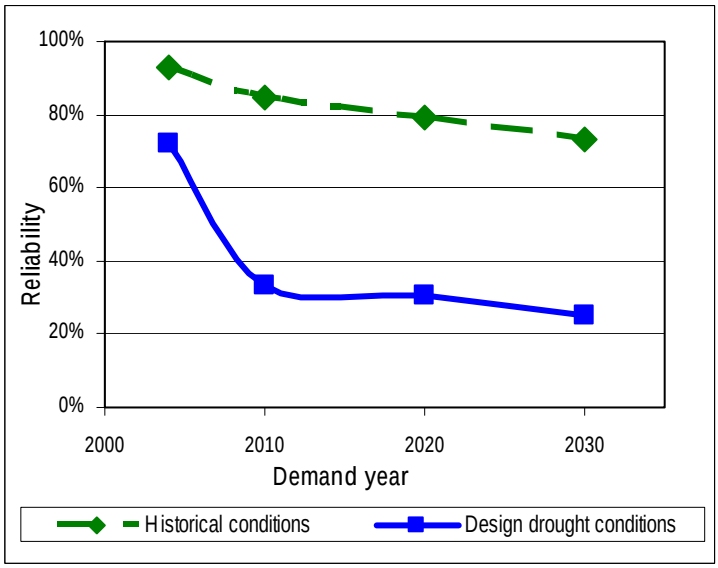

Figure 1. GFCSD Reliability

GFCSD Reliability - No Plan and Experimental and SRI Trigger Plan Comparison

Table 2. GFCSD Trigger Plan Summary				
		Trigger Plan		
Year	Description	No plan (no drought plan or demand reduction)	Experimental (based on GFCSD reservoir levels)	SRI (based on DWR Water Year Type, GFCSD reservoir levels, worst case expected inflows, projected normal demands)
2004	Reliability (%)	93.0	94.8	95.4
	% months drought declared	0[a]	7.4	24.7
2010	Reliability (%)	84.6	86.8	88.5
	% months drought declared	0[a]	14.2	32.4
2020	Reliability (%)	79.0	84.9	83.5
	% months drought declared	0[a]	17.5	35.9
2030	Reliability (%)	73.3	79.0	79.7
	% months drought declared	0[a]	23.6	38.7

Notes:

1. Reliability is based on the historical record (1911-1987). Because no gage records were available for the North Canyon and Big Canyon flows that are diverted into the reservoir, the SVM uses proportional flows from the North Fork of the Consumnes River near El Dorado, CA (USGS Gage No. 11333500) in order to get a reasonable estimate of monthly supplies to the GFCSD system.
2. Based on SVM 080807 version.
3. Assumes no well use.
4. Assumes zero water reserved for fire fighting.
4. Bolded values represent best value.
5. Reliability less than 100% means that additional curtailments would be necessary beyond whatever stage 3 measures are used.

[a] Since this alternative has no drought triggers, no drought policy is called in any month.

GFCSD Reliability – Drought Impact Avoidance Project Comparison

Table 3. GFCSD Drought Impact Avoidance Project Summary

Year	Projects	No climate change		Worst-case climate change scenario	
		Reliability %	% months drought declared	Reliability %	% months drought declared
2010	No project	86.8	14.2	81.0	24.1
	Well	88.5	13.9	83.3	24.1
	Offstream storage reservoir [a]	100	8.8	100	14.4
	Line existing reservoir	87.6	11.5	80.2	19.1
2030	No project	79.0	23.6	66.5	32.1
	Well	80.3	23.1	69.0	31.7
	Offstream storage reservoir [a]	99.3	16.2	98.6	22.3
	Line existing reservoir	78.2 [b]	20.9	67.4	31.2

Notes:

1. Reliability is based on the Experimental Trigger Plan
2. Reliability based on historical record 1911-1987.
3. Based on SVM 080807 version.
4. Reliability less than 100% means that additional curtailments would be necessary beyond whatever stage 3 measures are used.
5. Worst case climate scenario is PCM2100 – a cooler, drier climate estimate. Under this scenario some projects increase GFCSD reliability, but drought is declared more frequently.

[a] The experimental trigger plan which is based on current reservoir levels will become an irrelevant indicator if an offstream storage reservoir is built.

[b] Year 2030 "line existing reservoir" presents a slightly lower reliability than the Year 2030 "No Project" alternative (78.2% vs. 79.0%), but the average shortfall with the lined reservoir is 13.9 af whereas it is 14.3 without the lining. It becomes a process of small changes. The lining makes a difference in the first month, but when the reservoir is drawn down, there is no difference. In some cases the drought plan isn't triggered as early because of the lining, and so the shortfall is a little bigger because the demand is higher.

APPENDIX E

Drought Response Water Use Policies and Applied Stages

Water Use Policies and Stages Applied

Water Use	Policy	Water Shortage Stage Applied by Customer Type														
		Existing Residential			New Residential			Existing CII			New CII			Agriculture and Other Irrigation Only Users		
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Filling swimming pools and spas	Voluntary: Empty swimming pools are not to be filled with potable water	x						x								
	Prohibited: Empty swimming pools are not to be filled with potable water		x		x				x		x					
Washing vehicles and boats	Voluntary: No washing of vehicles (automobiles, recreational vehicles, trailers, etc.) or boats with potable water	x			x			x								
	Prohibited: No washing of vehicles (automobiles, recreational vehicles, trailers, etc.) or boats potable water		x	x		x			x		x					
Indoor plumbing (fixtures)	Voluntary: Incentive programs implemented to strongly encourage water savings. Reserve funds needed?	x			x											
	Rebates programs strongly offered. Commercial HET's, etc.							x			x					
Cleaning and construction purposes, including but not limited to dust control, settling of backfill, flushing of plumbing lines, and washing of equipment and buildings	Voluntary: Seek sources for all portable construction water tanks other than potable water for dust control, earthwork, road construction, etc.	x			x			x			x					
	Prohibited: Seek sources for all portable construction water tanks other than potable water for dust control, earthwork, road construction, etc. Exclusion for asbestos mitigation.		x	x		x	x		x	x		x	x			
Ornamental fountains and ponds except when water is re-circulated (Note: A sign is required to be located adjacent to the fountain stating that the water in the fountain is being re-circulated)	Voluntary: Ponds, lakes, and other non-irrigation water features shall not be filled with potable water.	x						x								
	Prohibited: Ponds, lakes, and other non-irrigation water features shall not be filled with potable water.		x		x				x		x					
Cleaning hard surfaces such as sidewalks, driveways, and parking	Prohibited: Prohibit washing of driveways, parking lots, and other surfaces with potable water. (Note: Sweeping will be encouraged as an alternative.)	x			x			x			x					
Landscape watering	Voluntary: all outside watering, including garden, lawn, landscape, domestic and pasture irrigation, parks, golf courses, school grounds, and public grounds shall occur between 6PM to 9AM	x						x								
	Prohibited: all outside watering, including garden, lawn, landscape, domestic and pasture irrigation, parks, golf courses, school grounds, and public grounds shall occur between 6PM to 9AM		x		x											
	Prohibited: all outside watering, including garden, lawn, landscape, domestic and pasture irrigation, parks, golf courses, school grounds, and public grounds shall not be watered with potable and raw GDPUD water															
	Prohibited: all outside watering, including garden, lawn, landscape, domestic and pasture irrigation, parks, golf courses, school grounds, and public grounds shall occur between 6PM to 9AM. 70% of water budget ok.								x		x					
	Prohibited: all outside watering, including garden, lawn, landscape, domestic and pasture irrigation, parks, golf courses, school grounds, and public grounds shall not be watered with potable GDPUD water. Parks, school grounds and public grounds ok to use			x	x					x		x				
Landscape development	Voluntary: Submit to Mandatory Landscape Review Process	x						x								
	Mandatory Landscape Review															
	Prohibited: Landscape Development		x		x				x		x					
Gutter flooding - water runoff caused by applying more water than soil can absorb	Prohibited: Penalties are applicable under the water waste ordinance	x			x			x			x					
Roof cooling	Prohibited: Penalties are applicable under the water waste ordinance	x			x			x			x					
Swamp coolers, watering of galvanized roofs or water to cool refrigerants without closed-loop system	Voluntary: Under water waste ordinance. Note: Incentives offered. Exclusion for elderly and low-income.							x								
	Prohibited: Under water waste ordinance. Note: Incentives offered. Exclusion for elderly and low-income.	x														
	Prohibited: Under water waste ordinance. Note: **No** Incentives offered. Exclusion for elderly and low-income.		x		x				x		x					
Construction	Voluntary: Seek sources for all portable construction water tanks other than potable water for dust control, earthwork, road construction, etc.	x			x			x			x					
	Prohibited: Seek sources for all portable construction water tanks other than potable water for dust control, earthwork, road construction, etc. Exclusion for asbestos mitigation.		x			x			x			x				
Water meters	Prohibited: Prohibited: No service for new potable accounts			x			x			x			x			
Mist Systems	Prohibited.	x			x			x			x					
Commercial Only Policies																
Eating Establishment Water Service	Prohibited: Water is not to be served to restaurant customers unless requested by customer. Table cards with drought notices required.							x			x					
Cooling Towers (dolphin and recirculating systems excluded)	Voluntary: Incentives to be offered.							x								
	Prohibited. NO INCENTIVES OFFERED.								x		x					
Agriculture Only Policies																
General Use	Recertify every 3 years that have 0.5 acres or more under production.													x		
IMS Program	Surcharge if not followed.															x
Growing Season use allotment	Voluntary awarded credit													x		
	Mandatory IMS participation. Penalties.														x	
	Mandatory and restricted IMS. Penalties.															x

Water Rationing Stages
1 - Preparatory (15%) - Voluntary
2 - Voluntary/Mandatory - Community Cooperation
3 - Mandatory - Allotments w. Severe Penalties

APPENDIX F

Suggested GFCSD Prohibition of Wasted Water

ORDINANCE NO. _____

AN ORDINANCE OF THE Grizzly Flats Community Services District INSTITUTING THE PROHIBITION OF WASTED WATER

SECTION 1. The **Grizzly Flats Community Services District** does hereby ordain as follows:

The <Code/Regulations> of the **Grizzly Flats Community Services District** hereby amended by adding Section _____ to _____, to read as follows:

"Section _____ - Water Waste Prohibitions

A. Purpose. The purpose of this Section is to promote water conservation and the efficient use of potable water furnished by the **Grizzly Flats Community Services District** by eliminating intentional or unintentional water waste when a reasonable alternative solution is available, and by prohibiting use of equipment which is wasteful.

B. Nonessential Uses. No customer of the **Grizzly Flats Community Services District** shall use or permit the use of potable water from the Grizzly Flats Community Services District for residential, commercial, institutional, industrial, agricultural, or other purpose for the following nonessential uses:

1. The washing of sidewalks, walkways, driveways, parking lots and other hard-surfaced areas by direct hosing, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety;

2. The escape of water through breaks or leaks within the customers plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of seventy-two (72) hours after the customer discovers such a break or leak or receives notice from the **Grizzly Flats Community Services District**, is a reasonable time within which to correct such break or leak or, as a minimum, to stop the flow of water from such break or leak;

3. Irrigation in a manner or to an extent which allows excessive runoff of water or unreasonable over-spray of the areas being watered. Every customer is deemed to have his water system under control at all times, to know the manner and extent of his water use and any run off, and to employ available alternatives to apply irrigation water in a reasonably efficient manner;

4. Washing cars, boats, trailers or other vehicles and machinery directly with a hose not equipped with a shutoff nozzle;

5. Water for non-recycling decorative water fountains;

6. Water for single pass evaporative cooling systems for air conditioning in all connections installed after <insert effective date of this ordinance> unless required for health or safety reasons;

7. Water for new non-recirculating conveyor car wash systems; and

8. Water for new non-recirculating industrial clothes wash systems.

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

D. Variances. Any customer of the Grizzly Flats Community Services District may make written application for a variance. Said application shall describe in detail why applicant believes a variance is justified.

1. The <manager or other authorized representative of the water purveyor> may grant variances for use of water otherwise prohibited by this section upon finding and determining that failure to do so would cause an emergency condition affecting the health, sanitation, fire protection or safety of the applicant or public; or, cause an unnecessary and undue hardship on applicant or public, including but not limited to, adverse economic impacts, such as loss of production or jobs.

2. The decision of the <manager or other authorized representative of the water purveyor> may be appealed to the Board of Directors by submitting a written appeal to the Grizzly Flats Community Services District within fifteen (15) calendar days of the date of the decision. Upon granting any appeal, the Board of Directors may impose any conditions it determines to be just and proper. Variances granted by the Board of Directors shall be prepared in writing and the Board of Directors may require the variance be recorded at applicant's expense.

E. Enforcement and Fees. Depending on the extent of the water waste the Grizzly Flats Community Services District may, after written notification to customer and a reasonable time to correct the violation as solely determined by the Grizzly Flats Community Services District , take some or all of the following actions. Penalties, fees and charges noted below shall be established by resolution of the Grizzly Flats Community Services District .

1. Written notice to the customer of the water waste violation including a specified period of time to correct the violation.

2. Personal contact with the customer at the address of the water service. If personal contact is unsuccessful, written notice of the violation including a date that the violation is to be corrected may be left on the premises, with a copy of the notice sent by certified mail to the customer.

3. The Grizzly Flats Community Services District may install a flow-restricting device on the service line.

4. The Grizzly Flats Community Services District may levy a water waste fee to the customer.

5. The Grizzly Flats Community Services District may cause termination of water service and the charge for same shall be billed to the customer. Except in cases of extreme emergency as solely determined by the <manager or other authorized representative of the water purveyor>, service shall not be reinstated until verified by the Grizzly Flats Community Services District that the violation has been corrected and all charges and fees have been paid.

SECTION II. SEVERABILITY

If any section, subsection, sentence, clause, phrase, or word of this ordinance is for any reason held to be invalid, the validity of the remaining portion of this ordinance shall not be affected.

SECTION III. ENVIRONMENTAL DETERMINATION

The Grizzly Flats Community Services District determines that this ordinance is a Class 7 categorical exemption under section 15307 of the California Environmental Quality Act, which exempts actions by regulatory agencies for protection of natural resources.

SECTION IV. EFFECTIVE DATE

This ordinance shall become effective (30) days after the date of adoption.

PASSED, APPROVED AND ADOPTED this ____ day of _____, 20__, by vote as follows:

AYES:_____ ABSTAIN:_____
NOES:_____ ABSENT: _____

<PRESIDENT of BOARD>

ATTEST:

<CLERK or SECRETARY of BOARD>

APPENDIX G

Public Outreach Example Resources

Public Outreach

Source: U.S. Bureau of Reclamation, SCCAO Drought Handbook for M&I Water Contractors, April 2003.

Example Menu of Options for Public Outreach

Place a checkmark by the options that you will consider including in your public awareness campaign during a water shortage.

Menu of Options for Public Outreach	Stage
Bill Inserts for water bills	
Public service advertising – run for free by local media	
Paid Advertising – Newspaper	
Paid Advertising – Radio	
Paid Advertising – Television	
Paid Advertising – Movie Slides for local movie theaters	
Paid Advertising – Chamber of Commerce Newsletter	
District newsletter	
Classroom Presentations	
Water Shortage Pamphlet – mass distribution to all customers	
Water Shortage Website	
Public Workshops – Drought Survival – Water conservation	
Water Shortage Information Center	
Public Advisory Committee	
Displays in District Office	
Water efficient fixture rebates	
Water efficient fixture distribution	
Promote use of Greywater	
Drought Tolerant Plant Tagging Program at local nurseries	
Promoting CIMIS information	
Water Shortage Hotline	
Water Audits	
Displays in Public Libraries, at local schools, shopping malls, etc.	
Bus ads	
Billboards	
Promotional Items with a conservation message (mugs, rulers, stickers, pens)	

Source: Santa Barbara County Water Agency, 2001.

Checklist for Keeping the Media Involved

____ 1. Create a media list to ensure that all available local media are used – select an official representative at each radio station, newspaper, and television station to serve as a point of contact for water shortage information released from your district. See Worksheet below.

____ 2. Establish a public advisory committee

____ 3. Include public and media in the water shortage planning process

____ 4. Organize water shortage information meetings for the public and the media.

____ 5. Publish and distribute pamphlets on water conservation techniques and water shortage management strategies

____ 6. Organize workshops on water shortage related topics

____ 7. Prepare sample ordinances on water conservation

____ 8. Establish a water shortage information center

____ 9. Write reports for the media early in the course of the water shortage and prepare weekly press releases with current water shortage conditions

____10. Establish a list of authorities on water shortage that can be distributed to the media for further reference.

____11. Organize education activities for the media.

____12. Establish a budget for advertising water shortage programs

____13. Write reports for media early in the event

____14. Prepare reports on the efforts of the water district to conserve water – conjunctive use, system audits, meter retrofits, training for staff, etc.

____15. Establish or use an existing newsletter to provide an overview of water shortage activities, tips for conservation, articles showcasing local conservation efforts on the part of homeowners and businesses.

____16. Conduct press conferences as needed. Use on-location approach if photo opportunities exist (i.e., a local reservoir when reservoir is visibly low)

Media List

Use this table to create your media contact list. Be sure to include all media in your community.

Media List			
	Name	Email	Phone/Fax
TV Stations - include government access channels			
Print Media - include newspapers from local colleges and news clipping services			
Radio Stations			
Chambers of Commerce			
Political leaders			
Water Dist. Board			
County Sups			
City Council			
Assembly			
Congress			

Source: Santa Barbara County Water Agency, 2001.

APPENDIX H

Drought Advisory Committee Comments on Drought Plan Strategy - October 29, 2007 Workshop

Drought Advisory Committee
Comments on Drought Plan Strategy
October 29, 2007 Workshop

1. Consider taking PL 101-514 contract water rights at an upstream location during declared Drought (Stage 2). Similar to the benefits of SMUD contracted rights of 15,000AF are less benefit if taken at Folsom Lake that requires pumping up hill to the extent possible.

2. Seek water rights and storage for 17,000AF of local sources of water (not just M&I water rights, but also water for agricultural use)

3. Revisit the agreements for Caples Lake storage for use in Drought Stage 2&3 (this is cheapest water available), The agreement has no dry year provision in the agreement and it is recommended to make dry-year conditions trigger the ability of maintaining lower storage levels for additional water supply.

4. Look to expand the uses of non-potable uses as the recycled water treatment systems expand (e.g. construction water, dust control). Currently, the recycled water system is maximized and requires make-up water to meet treatment and pressure system demands.

5. Need added flexibility to enhance system delivery reliability (e.g. water rights, dry year options)

6. Investigate the feasibility of using tunnels and mines to move or store water (outline the requirements for emergency transfers, i.e. Hazel Creek Tunnel from Project 184 Forebay to Sly Park Reservoir)

7. Incorporate into the Drought Plans for triggers from Governor Emergency declaration that would include communications, emergency transfers, interconnections, United States Bureau of Reclamation emergency funding (e.g., floating pumps to reach Folsom Lake levels for the El Dorado Hills Water Treatment Plant intake) and other response measures as appropriate.

8. Coordinate with Cosumnes American Bear Yuba (CABY) Planning Committee discussions to move more water to Folsom Lake (i.e. NID surplus water that could offset flow requirements from GDPUD and/or EID into Folsom Lake)

9. Follow-up on research in the CABY study on how to use meadow storage, restoration and recharge areas that were identified to investigate feasibility of added storage at higher elevations.

9. NEED ADDITIONAL STORAGE (both surface & groundwater) to offset the reduced snowpack natural storage that feeds our existing storage. Given scientists

currently project that more and more supplies will be from precipitation than snowpack and will need to be carried over from year to year, water providers need to better equilibrate rainfall and snowpack melt runoff conditions through more storage capability.

10. Need enhanced interagency coordination including day to day support now and then heightened frequency in dry-years (e.g. new Grizzly Flats reservoir on USFS land swap with El Dorado Irrigation District opportunity)

11. Need to promote drought and fire resistant plantings (e.g. immediate in coordinate with Fire Safe Council along with the new 100 ft clearance mandate)

12. Need to incorporate more demand for fires flows, and need more recycled water seasonal storage (i.e. quarries) and also exchange recycled water to Folsom for potable water rights.

13. Need to capitalize on conservation potential with grants funding that leads to action, get proposals ready for emergency grant funding.

14. Need fixes for supply infrastructure with County assistance (e.g., facilitation and contract negotiations).

15. Coordinate with California Department of Water Resources, who plans to hold small system workshops (e.g., support for GFCSD) and investigate funding assistance for more water supply reliability.

16. Consider cloud seeding

17. Enhance web sites and other notifications on actual customer water use in real time (e.g., self reading for water meters like the Badger remote data loggers that go on refrigerators such that customers can have a better self-assessment of their usage (AMR components now block ability to self-read meters).

18. Have signage on total monthly (or weekly) water use by neighborhood and remote reading to help customers have feedback on how they are doing.

19. Modify water shortage response actions by greatest water savings. Group by water use type vs. customer category.

20. Put into place interruptible supply contracts (e.g., parks have reduced rates for less reliability)

21. Create a mechanism that allows for higher allocations for those that already conserve (e.g., track accounts that have taken a rebate or performed a Water Wise House Call) and given them preferred allocations or lesser surcharges so they are not penalized for taking early action.

22. RESERVE FUND – establish an adequate funding reserve to sustain district operations in times of drought with the options for employing surcharges to trigger demand reductions and help with fiscal solvency in times of demand curtailment.

23. Estimate hidden costs of the drought like higher cost of services (e.g. water quality, energy use, manpower) that occur in times of demand shortfall to ensure that financial reserves and surcharge revenues will be adequate to meet needs.