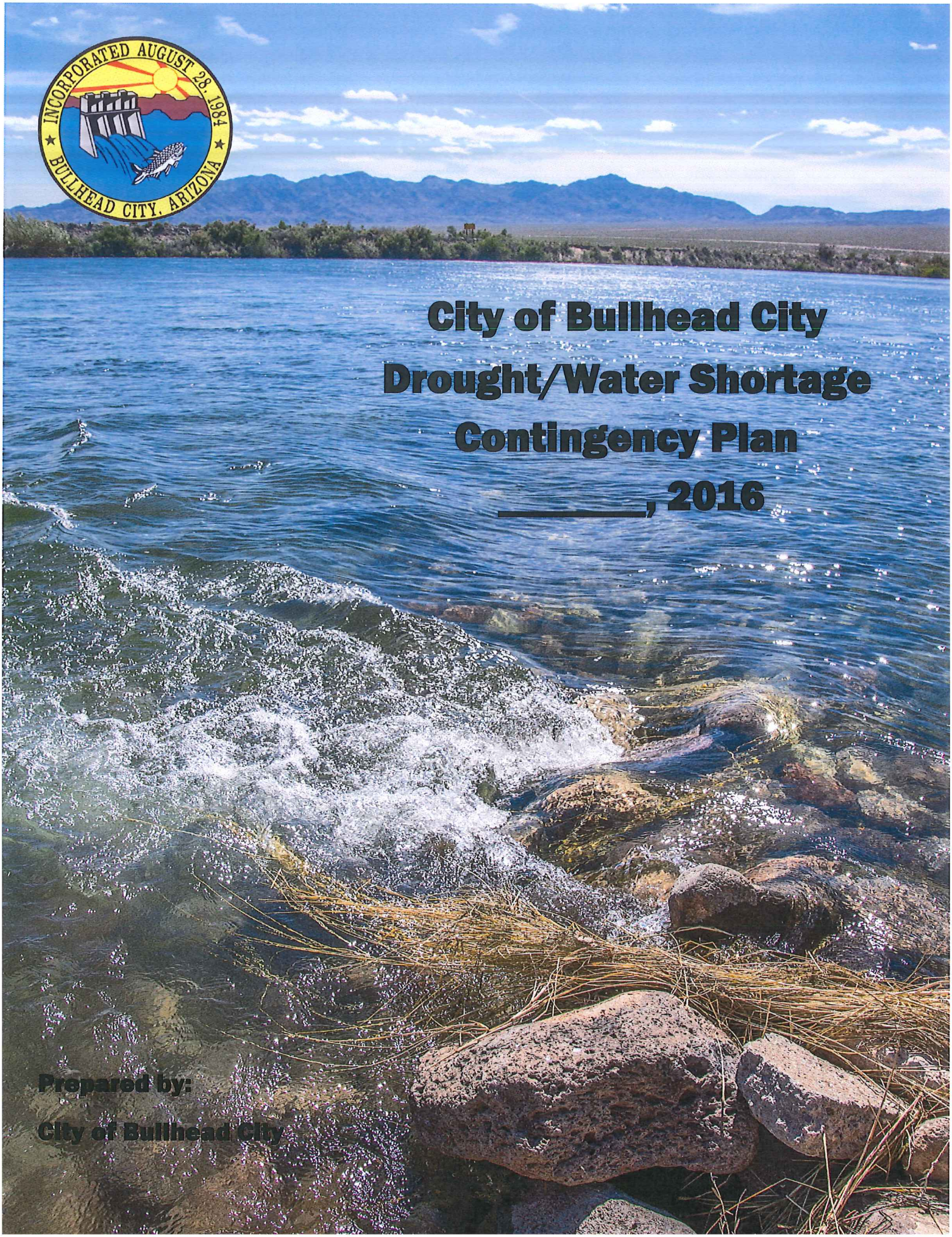

City of Bullhead City Drought/Water Shortage Contingency Plan

_____, 2016

Prepared by:

City of Bullhead City

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Acknowledgments

This Drought/Water Shortage Contingency Plan provides a first step in planning for, and managing drought/water shortages. The overall goal is to establish supply reduction response measures that will assist the City of Bullhead City in maintaining a dependable and safe water supply. This will support the planning area's economic base and enhance the quality of life for existing and future residents.

Bullhead City Council

Tom Brady, Mayor
Steve D'Amico, Vice Mayor
Kathy Bruck
Mark Clark
Sheila Shutts
Tami Ring
Annette Wegmann

Bullhead City Water Resources Advisory Committee

Fred Lamb, Chairman
David Evans, Vice Chairman
Jan Barrios
Steve Buck
John McCormick

Bullhead City Staff

Pawan Agrawal, PWD/City Engineer
Janice D. Paul, Administrative Analyst

Drought /Water Shortage Responsibilities

Water Supply Contract Holder:
City of Bullhead City, 2355 Trane Road, Bullhead City, AZ 86442

Officers responsible for directing operations during a water shortage emergency:
City of Bullhead City, City Council.

Responsible for implementing drought response stages:
Janice D. Paul, Administrative Analyst. Phone: (928) 763-0122

Subcontract Water Utilities:
EPCOR Water Company, Dave Evans, (928) 763-0487
Utilities, Inc. Water Company, Debra Fields, (928) 763-6676

Authority and Purpose

On March 20, 2003, Governor Janet Napolitano issued an executive order and established the Governor's Drought Task Force to address the drought issues facing all Arizonans. The Task Force made several recommendations, documented in the *Arizona Drought Preparedness Plan*, including that the Governor seek legislative authority for the Arizona Department of Water Resources (ADWR) to require all potable water systems develop a drought plan. Based on the Governor's Drought Task Force recommendation, the drought plan would include mitigation strategies, and a water conservation plan to reduce vulnerability to drought and plan for drought response actions. In addition, the Governor's Drought Task Force recommended legislative authorization for ADWR to require all water systems to provide consistent and coordinated water supply information to ADWR.

Recognizing the need for adequate water planning, the Arizona Legislature passed House Bill 2277 during the 2005 legislative session. House Bill 2277 established a requirement for community water systems to develop and submit a system water plan to ADWR. The system water plan has three components; a water supply plan, water conservation plan, and a drought preparedness plan. The development of system water plans is an important step toward improving water resource management planning at both the state and local levels. These plans will allow the state to identify data gaps and gather much needed information. In addition, these plans will allow the state to increase public awareness regarding water supplies, local drought preparedness and response measures, and to promote appropriate statewide conservation practices.

Introduction

This drought/water shortage contingency plan was developed by the City of Bullhead City for the purpose of future planning and mitigation. This plan will satisfy the ADWR system water plan requirements for the drought preparedness component. In addition, this plan will satisfy the United States Bureau of Reclamation (Reclamation) conservation plan requirement to develop a drought/water shortage contingency plan which is a best management practice (BMP) conservation measure. The drought/water shortage contingency plan provides for implementation of measures in response to a reduction in available water supply resulting from drought, infrastructure failure, or other circumstance resulting in water supply shortage. It identifies the impacts of potential reductions to the sub-contracted private water companies. Impacts of reduced water supplies are defined for both financial (rate impacts) and physical supply aspects. Drought/water shortage scenarios are discussed as they relate to impacts, mitigation, and future planning.

Drought/Water Shortage Scenarios

Most communities throughout the State of Arizona utilize both surface water and ground water to serve their potable water needs. Bullhead City is exclusively dependent on the Colorado River. The Colorado River Compact of 1922 provides the framework from which the State of Arizona receives its allocation of river water. Subsequent federal enabling legislation and court cases have affirmed the principles of the Compact. The City of Bullhead City diverts its Colorado River surface water allocation through groundwater wells. The withdrawn groundwater is accounted as Colorado River surface water due to the withdrawal of water from the Colorado River aquifer below the "water accounting surface" (WAS) elevation as defined by the United States Geological Survey (USGS), and as stated in water contract with Reclamation.

If the Secretary of the Interior were to declare a shortage on the Colorado River, the users of River water in the Lower Basin States (of which Arizona is one) must share the shortage in accordance with the December 2007, Record of Decision - Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead. In addition, Colorado River users must share the shortage based on the priority of their water right. Bullhead City's right to Colorado River water is fourth priority, which for comparison purposes is the same priority as Central Arizona Project (CAP) water. Therefore, deficits in supply may be caused by mandatory reductions. The Arizona Water Banking Authority (AWBA) is mandated to reserve long-term storage credits accrued with general fund appropriation revenues for the benefit of M&I users of Colorado River water outside of the CAP service area. To date, approximately 420,000 acre-feet of credits have been developed by the AWBA with general fund appropriations. Since 2005, the Mohave County Water Authority (MCWA) has banked (firmed) 107,239 acre-feet of long-term credits on behalf of Bullhead City at a cost of approximately $2,156,772. According to the ADWR's Director's Shortage Sharing Workshop Recommendations dated October 24, 2006 the River Cities' cutbacks will be based on their total allocation rather than actual usage because the Colorado River is their only source of water. The CAP communities have other alternatives to offset the impacts of a shortage. This will give

the river cities until 2026 to prepare for drought and shortage conditions, unless drastic changes to the River hydrology change.

Additional costs will be incurred at the time the long-term storage credits are actually used. The recovery (groundwater pumping) would need to be conducted following a specific process outlined by the AWBA (Bullhead City, through the MCWA, has a contract with CAP to recover this water in times of shortage); water contractor holding a right of equal or higher priority must forbear diversion of defined quantity, in exchange for water being left on the Colorado River for Bullhead City to access through its wells. The exact process associated with this recovery and exchange is not fully developed.

The development of a staged response plan for Bullhead City was based on an evaluation of how reductions in Colorado River water supply would impact the community. **Figure 1** illustrates the City's water resources supply portfolio (including reclaimed water) with a 20% Colorado River water supply reduction. There are two projected demand lines at a 2% growth rate. The red demand line is the projected demand based upon the current gallons per capita per day consumption rate. The yellow demand line reflects the demand if 10% conservation is achieved. The reclaimed water supply has not been reduced in Figure 1 because it is assumed that only minor reclaimed water reductions occur due to conservation associated with indoor plumbing fixtures and associated use behaviors. This evaluation was used in the development of Stage 3 – Moderate Shortage of the Recommended Response Plan. The recommended implementation measures should allow the City to adequately provide water service if a 20% shortage in supply were to occur through year 2025. This does not include the use of any banked water associated with the AWBA, but does include use of reclaimed water (both direct reuse and recharge and recovery). The use of reclaimed water in the quantities needed during a 20% Colorado River supply reduction is directly related to additional infrastructure. To fully utilize all available and needed reclaimed water, additional infrastructure must be planned, funded, constructed, and maintained.

Figure 1: Supply vs. Demand for 2.0% Projected Growth Rate, 20% Reduction in Supply

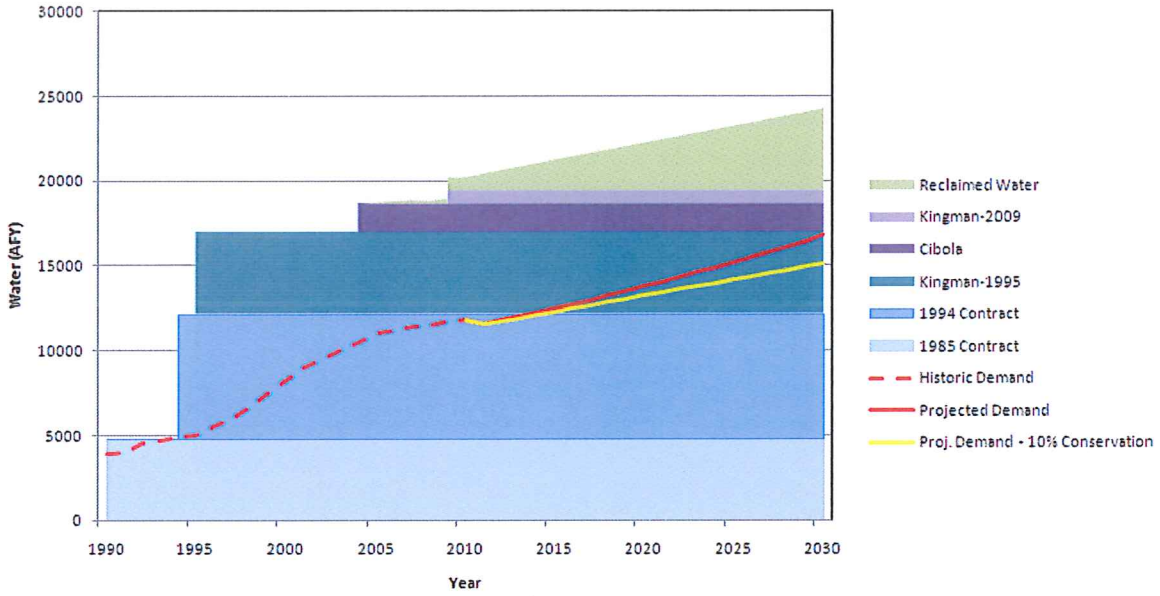
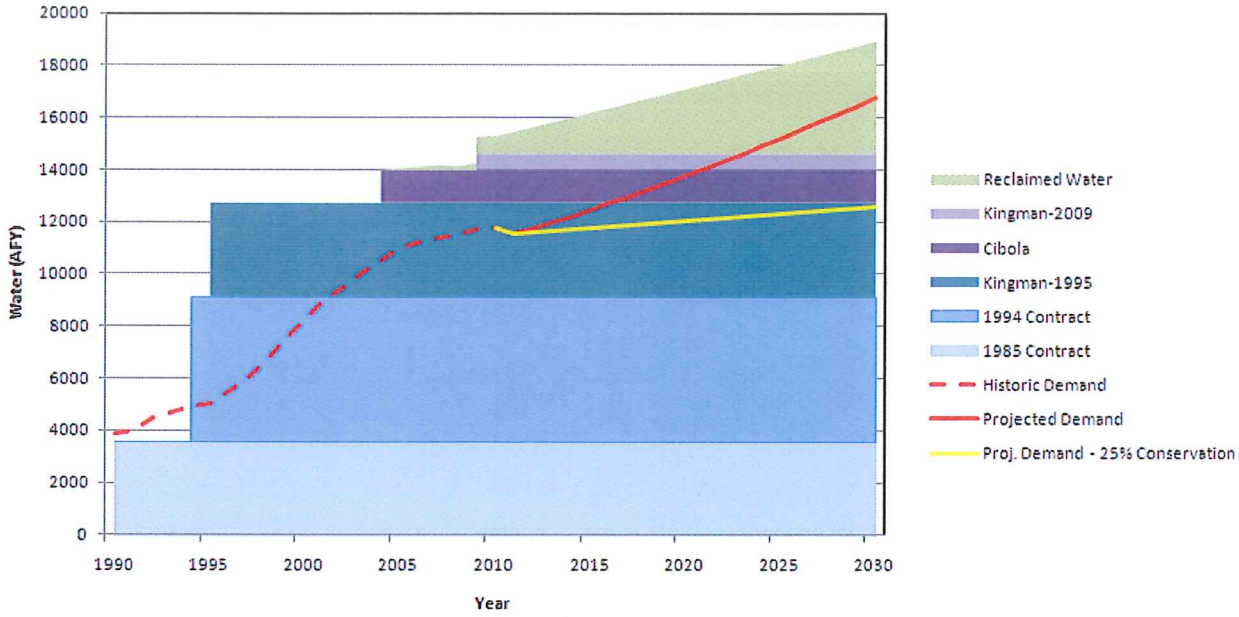


Figure 2 is a graph of the City's water resources (including reclaimed water) with a 40% Colorado River water supply reduction. There are two projected demand lines at a 2% growth rate. The red demand line is the projected demand based upon the current gallons per capita per day consumption rate. The yellow demand line reflects the demand if 25% conservation is achieved. The reclaimed water supply has been reduced by 10% due to impacts from conservation associated with indoor plumbing fixtures and associated use behaviors. This evaluation was used in the development of Stage 4 - Severe Shortage of the Recommended Response Plan. The recommended implementation measures should allow the City to adequately provide water service if a 40% shortage in supply were to occur through year 2025. This does not include the use of any banked water associated with the AWBA, but does include use of reclaimed water (both direct reuse and recharge and recovery). The use of reclaimed water in the quantities needed during a 40% Colorado River supply reduction is directly related to additional infrastructure. To fully utilize all available and needed reclaimed water, additional infrastructure must be planned, funded, and constructed on an accelerated schedule to the degree possible.

Figure 2: Supply vs. Demand for 2.0% Projected Growth Rate, 40% Reduction in Supply



Recommended Response Plan

The staged response recommendations in the following table are provided with the intent that they will be used in a policy development process to establish an enforceable staged drought/water shortage approach to supply reduction, and were developed considering the following key components:

- Demand reduction potential
- Type of use priority and reduction
- Rate/financial mechanisms and impacts
- Role of private water companies
- Equitable impacts and mitigation for each of the private water companies under sub-contract that serve Bullhead City
- Voluntary vs. mandatory
- Turf irrigation vs. drinking water
- Conservation
- Public education
- AWBA stored water recovery and delivery
- Opinions of probable shortage conditions
- Planned use of reclaimed water
- Demand vs. supply analysis

The following staged response plan is recommended for Bullhead City:

Stage & Response	Implementation Measures[1]	
	City and Water Providers	Customers
Normal **Lake Mead elevation is at or above 1,076 ft. on January 1st.**	Enforce applicable provisions of Chapter 8.14, Water Conservations and Restrictions Implement Water Conservation best management practices (BMP). Improve infrastructure and storage facilities, if necessary. Initiate planning for additional reclaimed water infrastructure (includes funding, right-of-way, and land acquisition). Plan to shift demands that do not require potable water to reclaimed water supply. Investigate locations for underground storage of unused portions of secured water resources.	Comply with the applicable provisions of Chapter 8.14, Water Conservations and Restrictions.
Shortage Declared **Lake Mead elevation is at or below elevation 1,075 and at or above 1,050 ft. on January 1st.**	Enforce applicable provisions of Chapter 8.14, Water Conservations and Restrictions Communicate conditions, increase outreach and provide conservation education and tips. Increase use of reclaimed water for non-residential landscaping to reduce potable water supply shortages.	Comply with the applicable provisions of Chapter 8.14, Water Conservations and Restrictions.
Shortage Declared **Lake Mead elevation is at or below elevation 1,050 ft. and at or above 1,025 ft. on January 1st.**	Enforce applicable provisions of Chapter 8.14, Water Conservations and Restrictions Provide water conservation incentives for residences and businesses that install efficient alternative landscaping and/or plumbing systems. Continue to shift demands that do not require potable water to reclaimed water supply. Store unused reclaimed water and unused portion of Colorado River supply in aquifer outside of water accounting surface (WAS). Plan for replacement costs for AWBA water. Option: Request AWBA water if necessary.	Comply with the applicable provisions of Chapter 8.14, Water Conservations and Restrictions.
Shortage Declared **Lake Mead elevation is at or below elevation 1,025 ft. on January 1st.**	Enforce applicable provisions of Chapter 8.14, Water Conservations and Restrictions Continue to shift demands that do not require potable water to reclaimed water supply. Store unused reclaimed water and unused portion of Colorado River supply in aquifer outside of water accounting surface (WAS). Option: Request AWBA water if necessary.	Comply with the applicable provisions of Chapter 8.14, Water Conservations and Restrictions.