

**DROUGHT MANAGEMENT STRATEGY PLAN
POST OAK SAVANNAH GROUNDWATER CONSERVATION DISTRICT**

Background

Chapter 36 of the Texas Water Code requires groundwater conservation districts to address drought conditions as part of the development and implementation of groundwater management plans (Section 36.1071 (a)(6)). The Groundwater Management Plan of the District includes a goal to "Develop a Management Strategy to Address Drought Conditions" (Section 10.6). The strategy is as follows:

Management Objective

The District will develop and adopt a Drought Management Strategy Plan within one year of the adoption and certification of this [groundwater management] plan, review it annually, and revise it if necessary. This [drought management strategy] plan will be implemented when specified conditions require.

Performance Standard

1. Development and adoption of a Drought Management Strategy Plan within one year of the adoption and certification of this [groundwater management] plan.
2. Review all of the conditions and requirements specified in the Drought Management Strategy Plan which would trigger implementation on an annual basis.
3. Implement the Drought Management Strategy Plan when specified conditions require.

In addition, Section 36.113 (c)(7) of the Texas Water Code permits the District to require well permit applicants to provide a drought contingency plan as part of the permit application process.

The purpose of this Drought Management Strategy Plan is to fulfill the requirements of the District's Management Plan and provide a basis for management of groundwater resources during droughts.

Drought Planning

As part of the granting of well permits and groundwater transfer permits, the District requires submittal of Drought Contingency Plans developed by local water utilities. These plans focus on water system demand conditions and specify actions that are taken by local utilities to conserve water under certain demand scenarios. Typically these actions include a staged approach involving:

1. Customer Awareness
2. Voluntary Water Conservation
3. Mandatory Water Use Restrictions
4. Critical Water Use Restrictions

The District's approach is focused on supply conditions in order to ensure that adequate groundwater supplies are available to sustain needs in the District during drought conditions. Drought planning relevant to the management of groundwater supplies in the District includes the development of the Central Carrizo-Wilcox and Queen City/Sparta Groundwater Availability Model (GAM) which includes simulations of drought conditions and effects on recharge and aquifer conditions. In addition, water planning for the Region G Water Planning Group has included simulations of groundwater conditions in the Carrizo-Wilcox aquifer system affected by projected water demands.

Droughts affect groundwater availability in two ways: (1) reduction of recharge from precipitation on the aquifer outcrop and from reduced infiltration of surface water, and (2) increased demand from groundwater pumping to make up for surface water supplies that are more susceptible to drought conditions. Both of these generic conditions were simulated in the Central Carrizo-Wilcox GAM by reducing recharge in drought years and altering the winter and summer pumping rates by a factor of 2 during drought years. Based on the GAM simulations, groundwater levels in the Carrizo-Wilcox aquifer system decrease substantially in drought years

but the aquifer remains fully saturated. Specifically, water levels predicted for the year 2050 using average and drought-level recharge rates differ by less than 5 feet and only near the outcrop area of the Simsboro. Similar results were found for the Queen City/Sparta GAM, which also showed less than 5 feet difference in groundwater levels between average recharge and drought conditions.

Currently there is very little, if any, long-term groundwater level data that illustrate how aquifer conditions will change during droughts, particularly when combined with the onset of large-scale groundwater development and export projects proposed for the District. Efforts to develop a District-wide groundwater monitoring plan for specific groundwater management zones capable of evaluating aquifer conditions in droughts are underway in early 2005.

Strategy Elements

The strategy to manage District groundwater resources in droughts involves three elements:

- Assess the District's vulnerability to drought and define triggering criteria for specific management zones.
- Determine drought response goals and measures.
- Revise and update the plan.

Assess drought vulnerability and define criteria for management zones

Water level measurements in the District that may be used as drought management triggers have not been identified. Over the next several years rainfall stations and water levels in monitoring wells should be measured and evaluated to establish a basis for revising this initial drought management strategy plan. The drought vulnerability assessment will need to be specific to groundwater management zones, reflecting the differences in aquifer depths, local and

regional use patterns (e.g., local domestic or municipal use versus regional export), recharge area in the District, and other factors.

Response Goals

Similar to strategies employed by local water utilities, the District strategy should include multiple response goals (e.g., trigger levels) based on water demands. This initial set of response goals is focused on the Simsboro aquifer (and to a lesser extent, the Carrizo aquifer) as the primary target for groundwater development and export outside the District. The first, second, and third response goals would begin when daily water demands during a month period exceed 75 percent, 85 percent, and 95 percent, respectively of the District's groundwater transfer/export capacity. As of early 2005, permitted and proposed transfer/export quantities for the Simsboro aquifer are approximately 30,000 ac-ft/yr in Burleson County and may be 35,000 ac-ft/yr in Milam County. Current Region G groundwater planning recommendations for the District are for 90,000 ac-ft/yr for the Carrizo-Wilcox (which includes 48,000 ac-ft/yr from the Simsboro aquifer)

The recommended response goals are:

- **Response Level 1 (75%)** - public awareness and notification of drought conditions. This Level could also be triggered by occurrence of a moderate drought (defined as a Palmer Drought Severity Index of -2.0) over a 2-month period in the District.
- **Response Level 2 (85%)** - use of water rate incentives or penalties, (e.g. surcharges for excess use) for water suppliers outside the District receiving water from large wells located within the District. This Level could also be triggered by occurrence of an extreme drought (defined as a Palmer Drought Severity Index of -4.0) over a 2-month period in the District.
- **Response Level 3 (95%)** - imposition of water rationing (e.g., water allocation on a per household basis) on water suppliers outside the District receiving water from

large wells located within the District. Permits for large new wells should incorporate provisions for water rate incentives and water rationing as described.

Plan Revisions

As provided for in the District Groundwater Management Plan, this Drought Management Strategy Plan should be revised annually to incorporate recent groundwater monitoring data that would support the development of specific aquifer (groundwater management zone) and groundwater level triggers sensitive to drought conditions.