



**Barton Springs
Edwards Aquifer**
CONSERVATION DISTRICT



AQUIFER BULLETIN

May 2011

Stage II Alarm Drought Declared

At its April 28 Board meeting, the Board of Directors of the Barton Springs/Edwards Aquifer Conservation District declared Stage II Alarm Drought for the District. The drought declaration affects authorized water use by some 60,000 groundwater users primarily in northern Hays, southern Travis, and western Caldwell counties.

The Lovelady Drought Indicator Well, in the Edwards Aquifer and located in South Austin, dipped below its Alarm threshold of 175.0 feet depth-to-water on April 24. The 10-day average discharge at Barton Springs, the District's other official drought indicator, also dipped below its Alarm threshold of a 10-day average of 38 cubic feet per second, based on BSEACD manual measurements, on about April 22. For the Board to officially declare drought, only one drought indicator has to cross below its trigger threshold. In this instance, both the water levels in the Lovelady Monitor Well and springflow at Barton Springs prompted the drought declaration.



Figure 1: During Stage II Alarm Drought permittees are required to reduce pumping by at least 20%.

Despite the much-needed rainfall on May 12 of up to 2 inches, the aquifer remains in Alarm Stage drought. The rainfall helped vegetation, and possibly reduced some pumping for irrigation, but much more rainfall is needed to bring us out of drought. The rain bumped up springflow temporarily, but the flows quickly returned to the

see *AQUIFER STATUS* on page 3

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DROUGHT STATUS



Stage II Alarm Drought triggers:

Average Barton Springs flow below 38 cubic ft/sec.
Lovelady Monitor Well water level below 175 ft.

Mandatory Water Restrictions for Groundwater Users

Do your part and reduce your water use by 20%.

Remember:

- Irrigation systems and hose-end sprinklers:**
- Follow your utility's watering schedule.
 - Water during your designated times to reduce water lost to evaporation.

- Soaker hoses and/or drip irrigation:**
- During your designated times on watering day.

- Hand held hose with auto shutoff valve:**
- Wash cars during your designated times on watering day to limit amount of water used.
 - Water during your designated times on watering day.

- No filling or re-filling of pools**
- No non-essential use (water fountains, etc.)**

Contact your water utility for more information.

Thank you for helping to conserve groundwater resources in the Barton Springs portion of the Edwards Aquifer!

Find Us on Facebook!

Updates on scholarship contests, festivals, drought declarations, and aquifer updates are now available on the District Facebook page.



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BSEACD PERMITTING SUMMARY (January 2011 TO April 2011)

Permit Type	Number of Permits	Permitted Pumpage
Exempt Wells	1	N/A
NDU General Permits	1	500,000 gallons per year
Individual Production Permits	0	0
Permit Amendments	0	0
Transport Permits	0	0

Exempt Wells - These are low capacity wells used solely for large tract residential or livestock needs. These wells are exempt from permitting but must be registered with the District and meet District Well Construction Standards.

Nonexempt Domestic Use (NDU) General Permits - This authorization is for wells that will be used solely for the domestic needs of residences located on small lots where there is no other alternative water source available. This pumpage is subject to drought restrictions, but may be authorized during drought since it is the sole source of domestic supply.

Individual Production Permits - All other new nonexempt wells must have one of these permits to be authorized for pumpage. All new Individual Production Permits for Edwards wells are designated as "Conditional" Permits, which means that they are interruptible and subject to 100% curtailment during extreme drought.

Permit Amendments - These amendments are required to increase authorized pumpage for existing permittees (permit holders). All new permit amendments for Edwards wells are designated as "Conditional" Permits, which means they are subject to 100% curtailment during extreme drought.

Transport Permits - These permits are required to authorize the transport of groundwater out of the District. A Transport Permit may only authorize the transport of water permitted under an approved production permit.

- GUY RIALS, REGULATORY COMPLIANCE SPECIALIST

DISTRICT CALENDAR

The Board of Directors usually meets on the 2nd and 4th Thursdays of the month (beginning at 6 pm) at the District's office at 1124 Regal Row, Austin, TX 78748. However, the meeting schedule and location are subject to change. The agenda for posted meetings can be found on the District website at www.bseacd.org. Please contact the District office at 512-282-8441 with any questions.

May 26	Board meetings
May 30	Office closed for Memorial Day
June 9 & 23	Board meetings
June 20-23	Groundwater to the Gulf Educator Training
July 4	Office closed for Independence Day
July 14 & 28	Board meetings
Aug. 11 & 25	Board meetings

Aquifer Status (continued from page 1)

Alarm stage levels.

With more than seven months of rainfall and runoff deficit (Fig. 3), the drought declaration comes near the beginning of the heavy outdoor water-use season and also at a time when abnormally hot and dry conditions are forecast to continue.

Drought is not uncommon in Central Texas. Water level measurements at the Lovelady Well, one of the District's two drought monitoring stations, show the cyclic patterns in water level decline and recovery in the Barton Springs segment of the Edwards Aquifer through wet periods and drought (Fig. 4). The recent rate of decline in water level observed at the Lovelady Well from average (153 feet below land surface) to the Alarm threshold (175.0 feet below land surface) is similar to what was observed in 2008--3 months and 10 days in 2008 and 3 months and 14 days in 2011. Based on the rate of springflow and water level declines from the 2008-2009 drought, we estimate that it could take 4 to 5 months to reach Stage III Critical Drought levels if the dry conditions persist (Fig. 5).

Without reductions in demand, deeper drought stages, with even greater required curtailments of pumping and water use, will be reached sooner. Since groundwater is a shared resource, water conservation has to be a coordinated effort.

- BRIAN HUNT, SENIOR HYDROGEOLOGIST
AND BRIAN SMITH, PRINCIPAL HYDROGEOLOGIST

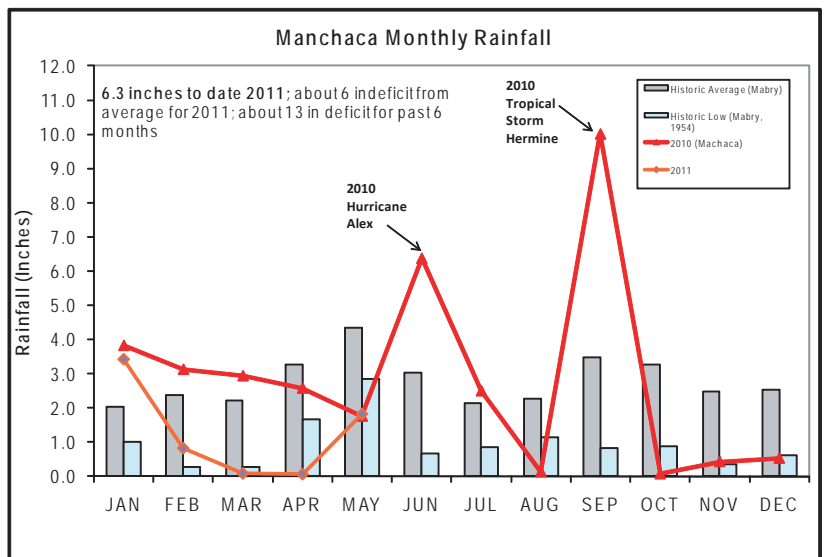


Figure 3: Rainfall totals for 2010 (red) and 2011 (orange) observed at the District weather station compared to historic averages recorded at Camp Mabry.

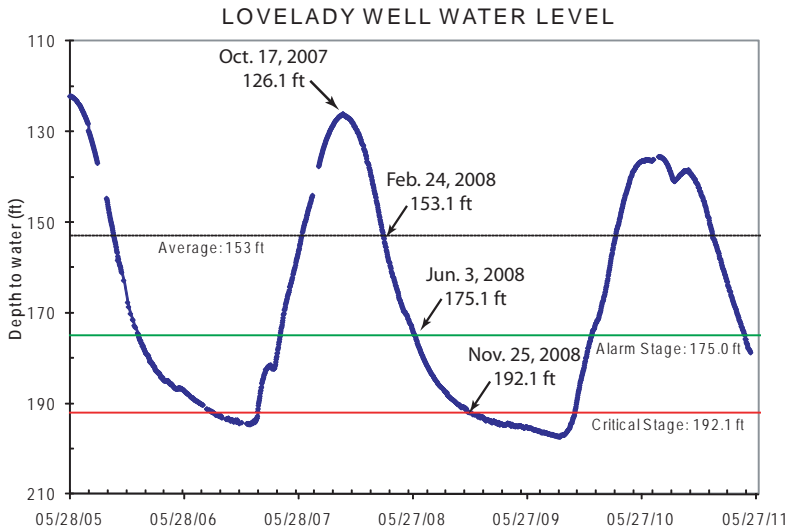


Figure 4: Water levels measured at the Lovelady Monitor Well in south Austin, near South 1st and Stassney.

	Drought Stage	Water Level Change		Date Range	Time Elapsed
----- 2008-2009 DROUGHT -----					
2008 - 2009 Drought	No Drought	153' to 175' (Average to Alarm threshold)	Decline	Feb. 24, 2008 - Jun. 3, 2008	3 months, 10 days
	Alarm Drought	173' to 192.1' (Alarm to Critical threshold)	Decline	Jun. 3, 2008 - Nov. 25, 2008	5 months, 22 days
	Critical Drought	< 192.1' (below Critical threshold)	Turning Point	Nov. 25, 2008 - Oct. 28, 2009	11 months, 3 days
	Alarm Drought	192.1' to 173' (Critical to Alarm threshold)	Recovery	Oct. 28, 2009 - Dec. 21, 2009	1 month, 23 days
	No Drought	173' to 153' (Alarm threshold to Average)	Recovery	Dec. 21, 2009 - Mar. 8, 2010	2 months, 15 days
----- CURRENT DROUGHT -----					
Current Drought	No Drought	153' to 175' (Average to Alarm threshold)	Decline	Jan. 10, 2011 - Apr. 24, 2011	3 months, 14 days
	Alarm Drought	173' to 192.1' (Alarm to Critical threshold)	Decline	Apr. 24, 2011 - Aug. or Sept. 2011 (estimate)	4-5 months (estimated)

Figure 5: Time periods spent in drought stages during the 2008-2009 and the current drought.

FROM THE GM'S DESK ...

Fear. Fear of future events that will affect your livelihood or your family's well-being. Especially fear of such events that you feel like you can't control, or prevent. It's a powerful force.

That force is at the root of a lot of the heated discussion over **groundwater ownership and property rights** that are currently in the public conversation. This discourse is even making it into the mainstream news media, not just locally but across the state and even in some national publications – rare for anything related to groundwater. But behind the posturing and the theatrics, there are some legitimate concerns and issues on either side of the debate that need to be addressed. The Texas Legislature is wrestling with how to go about addressing these issues. As of this writing, the bill passed by the Senate and the one being deliberated in the House are different, and a lot can happen to a bill on the House floor and in conference committee.

The proximate cause of these concerns is for the first time ever in most of the state, there are going to be statutorily mandated limits on the amount of larger groundwater withdrawals that are allowed. These limits derive from the Managed Available Groundwater (MAG) amounts required to achieve/maintain Desired Future Conditions. This recognition has produced fear and concern with various stakeholder groups: those that depend on groundwater for water supplies for their livelihood, like farmers and ranchers; those landowners who might have been preserving their groundwater as their personal legacy; those that utilize or plan on utilizing groundwater for public drinking water supplies; and those who have made significant investments to procure long-term water supplies or to market such supplies as a commercial venture.

It also is a concern to groundwater conservation districts like ours, inasmuch as some of the fear-based responses that are being demanded by these stakeholder groups could adversely affect or even preclude effective, fair, and balanced groundwater management.

Some parties are rather purposefully characterizing this as a contest between private property interests that are trying to protect their groundwater and Groundwater Conservation Districts (GCDs) that are trying to take their groundwater away. This inaccurate assessment is likely an attempt to mask some dimensions of the issue. The property interest in groundwater by the landowner is already established and statutorily defined. On the other hand, the Legislature has reinforced on numerous occasions that it is also in the public interest to utilize, preserve, and conserve this resource for the benefit of all landowners and groundwater users through management by GCDs. There is an expectation, even legal requirement, that it will be managed in a reasonable, fair, and equitable manner. And unlike claims by some, the issue is not a matter of right to produce any groundwater – every landowner of more than ten acres already has the right to produce a considerable amount of groundwater for domestic and livestock use without a GCD permit. The issue arises not from these users but from and with landowners that want to construct and use new larger-capacity wells to irrigate large agricultural areas; to provide new public water supplies to meet our growing population demands; or to produce groundwater as a new commercial venture, typically involving transport to off-site groundwater-using customers. There is

nothing wrong with those plans per se. But such larger new wells can affect the local aquifers and the existing wells of nearby landowners. Regardless of use and user, a GCD is a steward of a resource that must be simultaneously used and protected.

Unfortunately, the change that has been advanced as a “fix” not only isn't necessary to achieve that desired outcome but also doesn't guarantee that result for all groundwater users. In fact, while innocuous-sounding, it creates the likelihood of another problem that will adversely affect the ability of a GCD to manage groundwater. The new concern is that if the bill passes with the word “vested” purposefully inserted in front of the existing “property rights” ownership language already in Ch. 36 of the Water Code, it will by law create legal “standing” for any landowner, lessee, or assign to bring constitutional takings claims against GCDs, even if the GCD is legally, reasonably and fairly regulating the groundwater resources. In fact, I know of no other example in Texas law where the Legislature has seen fit to qualify a real property interest with the term “vested”.

Such a possible change is not good public policy and does not well serve most landowners, who want to preserve and use their groundwater on their own land rather than (legally) sever large amounts of groundwater from the land for use by unrelated, distant others. It is almost certain to lead to unnecessary litigation and higher legal defense expenses for a GCD by some disaffected party who will not accept the result of fair and equitable regulation without a legal fight. There are some folks like that! In fact, it could very well be used to eliminate a GCD's financial wherewithal to regulate and enforce its rules, which could then result in dissolution of the GCD. Rather than being improved, local groundwater management is more likely to be adversely affected with this new language, and without concomitant benefits for the local landowners as a group.

In addition, for many aquifer systems, including our District's karst aquifers, protecting the historical uses and users cannot be equitably accomplished by indexing the amount of authorized groundwater production to the amount of land owned, the so-called “correlative rights” approach. Many of the District's permitted public water supplies are from wells on very small tracts of land, and those historical-use supplies could be harmed by such an approach. Further, application of “correlative rights” could be an expected resolution to court cases where a large landowner has a “vested” property right and asserts a constitutional takings claim, even if language is added to the statute that says a correlative rights-based overall approach to groundwater management is not mandated.

Our District operates on the premise that protecting the private property rights of each landowner with respect to the groundwater underneath his or her land requires protecting the private property rights of all landowners at once. An aquifer is a system, and it needs to be managed as a system, not according to personal preferences of any one individual landowner overlying the aquifer. Adding a word here and there to legislation isn't the way to accomplish that, especially when those words take on much different significance than might be expected on first reading.

- KIRK HOLLAND, GM



The District's Plan for Planning

In past editions of the Aquifer Bulletin, we have reported on the recent round of groundwater planning that was just completed and the evolving regional-scale groundwater management scheme that has developed in Texas. The process was initially implemented in 2005 and the first round of joint-planning was just completed in September of 2010. Accordingly, the District has been "planning" for this by establishing policies and implementing various rounds of rule changes in anticipation of the products of this effort to be best positioned to manage our aquifers in the most efficient and equitable manner. On March 24, 2011, the District's Board took another step in this direction with the adoption of another round of amendments and revisions to the Rules and Bylaws.

In general, the new rules were adopted to clarify drought levels, pumping curtailment protocols, and user drought contingency plans; establish new permit classes and pumping allocations within the anticipated Managed Available Groundwater limit; and revise the Lovelady monitor well drought trigger thresholds for Stage III Critical and Stage IV Exceptional drought. These changes are not only in response to joint-planning efforts, but also further refine the District's ability to manage groundwater during drought which unfortunately, is again upon us. See the 'Rule Change Highlights' section for a brief summary of the highpoints of the changes with references figures for further explanation.

If you are interested in more details, we encourage you to view the final version of the District rules including these and other changes, which may be accessed at our website at www.bseacd.org/about-us/framework-policies/. As always, please feel free to contact us if you have any questions.

- JOHN DUPNIK, SENIOR REGULATORY COMPLIANCE SPECIALIST

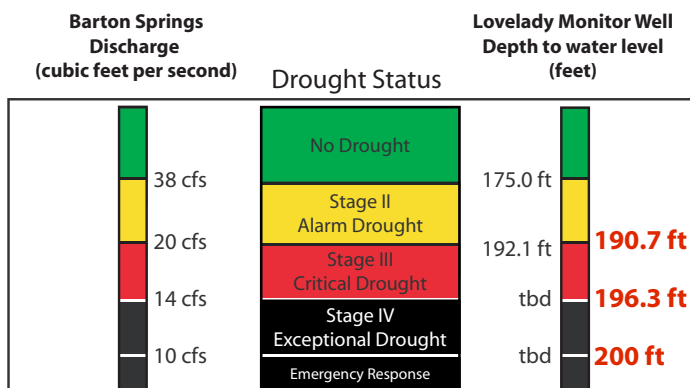


Figure 5. New and Adjusted Drought Trigger Levels (in red) for the Lovelady Drought Indicator Well.

Rule Change Highlights

- Revised drought stage names to include numerals more indicative of drought severity (Fig. 5).
- Revised provision to clearly indicate that meter readings are required even when a well is not in use.
- Revised provision for consistent assessment of late fees regardless of fee payment schedule.
- Adjusted the Extreme Drought Withdrawal Limitation (EDWL) from 7.5 to 6.0 cfs to reflect the District's authority to limit pumpage during extreme drought.
- Added provisions that would permanently convert certain Class A permits to Class B permits upon a declaration of Stage IV Exceptional Drought.
- Created two new classes of Conditional Production Permits (Class C and D) with requirement for 100% curtailment upon declaration of Stage II Alarm Drought.
- Allocated maximum permitting volumes for each Freshwater Edwards Permit type within the anticipated upper MAG (Fig. 6).
- Adjusted Stage III Critical Drought trigger level from 192.1' to 190.7' below the surface and added new trigger levels for Stage IV Exceptional and Emergency Response Period for the Lovelady Drought Indicator Well (Fig. 5).
- Adjusted Emergency Response Period Curtailment level for Non-Public Water System permittees from 100% to 90% and added a 60-day phase in period.

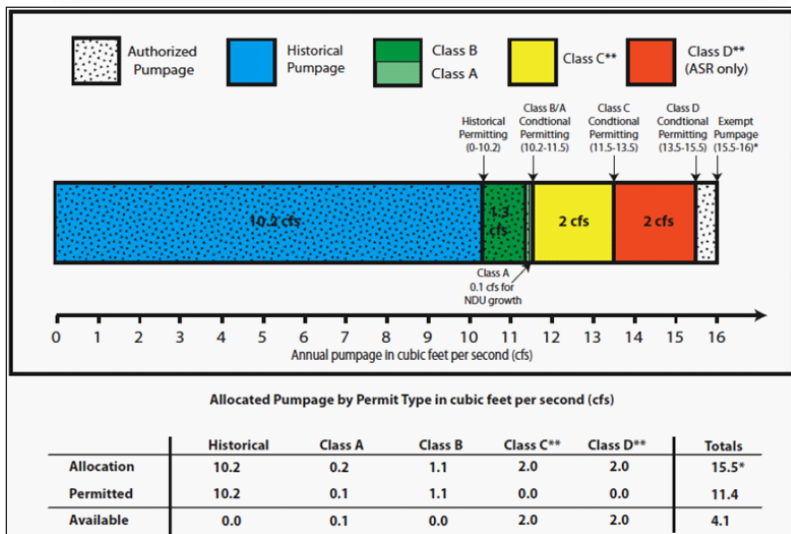


Figure 6. Allocations of permitted pumpage for each of the Freshwater Edwards permit types.

Update on District's Legislative Initiatives

BSEACD championed four quite different initiatives in the current legislative session. Two of these relate more to internal administrative matters, one relates to protection of the quality of the water recharging the aquifer, and one relates to enabling a more cost-effective alternative water supply. We have some clarity on two of these bills, and the outcome of the other two is dependent on what the Legislature does in the last two weeks of the session. The four bills and their status are summarized below

SB 292 (Watson) - Urban District Boundaries

This bill and its identical companion, HB 1281 (Workman), change the basis of the boundaries of the mandated two "Austin" director precincts from being linked to the changing City of Austin city limits to a fixed "urban core" defined by streets, streams, and BSEACD's jurisdictional boundaries. This would provide a better population balance and also assures that a larger geographic portion of the district will have director precincts that include groundwater use as a dominant water supply and also a larger pool of citizens from which to elect those directors. But opposition to this bill, presumably over allowing more of the City of Austin to be in the other three precincts, essentially killed this bill in House Local and Intent Calendars Committee.

SB 467 (Wentworth) - Aquifer Injection Prohibition

This bill, which has no house companion, is a collaboration among the District, EAA in San Antonio, a private constituent in San Antonio, and TCEQ. It allows for certain exceptions to the current prohibition on injecting anything into or through the Edwards except Edwards groundwater, which otherwise would restrict the cost-effective development of desalination of the Edwards as a new water supply by preventing the injection of brine concentrate into the non-potable parts of the underlying Trinity formation; the bill also would allow additional recharge of the freshwater Edwards using other natural waters, as long as the water quality was protected. This bill has been passed by the Senate and is in House Committee on Natural Resources. Some opposition, believed based on erroneous information about what the bill does, has been expressed, but the opponents to date have not been interested in working through the issue. The actual prognosis for this bill won't be known until the HCNR hearing. But at this point in the process, any unresolved controversy can be fatal to a bill.

SB 853 (Watson) - Effluent Treatment and Discharge in the Contributing Zone

This bill, which also has no house companion, protects the quality of the streams that recharge the Edwards Aquifer by specifying the quality of effluent that might be direct-discharged by new sewage treatment plants to these streams to be at a very high, drinking water quality level. The bill does not prohibit direct discharge or mandate any particular option as developers consider water and wastewater management plans, and helps promote on-site re-use by lawn irrigation with this high-quality treated water. This innovative bill is in the Senate Natural Resources Committee and has some opposition from certain parts of both the environmental community and the development community, and there is not sufficient time to attempt to resolve the opposition. This bill will not make it to the Senate floor this session.

SB 433 (Hegar) - Bastrop Deannexation

This bill and its identical companion, HB 1060 (Kleinschmidt), de-annexes the 410 acres of the District that is in Bastrop County, to remove the overlap with the Lost Pines GCD, which has primacy over this area owing to its later legislative creation. If this bill passes, BSEACD will be in three counties: Caldwell, Hays, and Travis. This bill does not affect the existing groundwater users in this area, and it simplifies meeting and hearing notice and other administrative requirements. The Senate bill has been passed by the Senate and is now in House Local; the House bill has been passed by the House, and is now in Senate Local. There has been no opposition to this bill, and its prospects for being signed into law look very good.

- KIRK HOLLAND, GM

Regulatory Compliance Reminder for District Permittees

Unfortunately, we again find ourselves in another drought and from the projections we've seen, we might not see any relief until later in the fall. Drought, of course, means more mindful water use by our permittees and the end-users in order to meet mandatory monthly drought curtailments. The primary component of your user drought contingency plans (UDCPs) (Fig. 7) for managing your pumpage while in drought is the monthly pumpage chart. This chart tells you everything you need to know about how much pumpage is allowed for each month and for each drought stage. It works by establishing a baseline pumpage volume for each month based on the typical usage distribution for specific types of wells (e.g. public water supply, irrigation, industrial). The 20%, 30%, and 40% curtailments are calculated from this baseline for Stage II Alarm, Stage III Critical, and Stage IV Exceptional Drought respectively.

A sample chart (Fig. 8) is provided as a reminder of how to use the chart. It represents a fictitious public water supply system (Water-Mart WSC) with historical permitted pumpage of 10,000,000 gallons per year. In this example, the cell highlighted indicates the maximum amount of monthly pumpage for May during Stage II Alarm Drought. Please feel free to contact District staff if you need any assistance with your pumpage chart or any other component of your UDCP.

- JOHN DUPNIK, SENIOR REGULATORY COMPLIANCE SPECIALIST

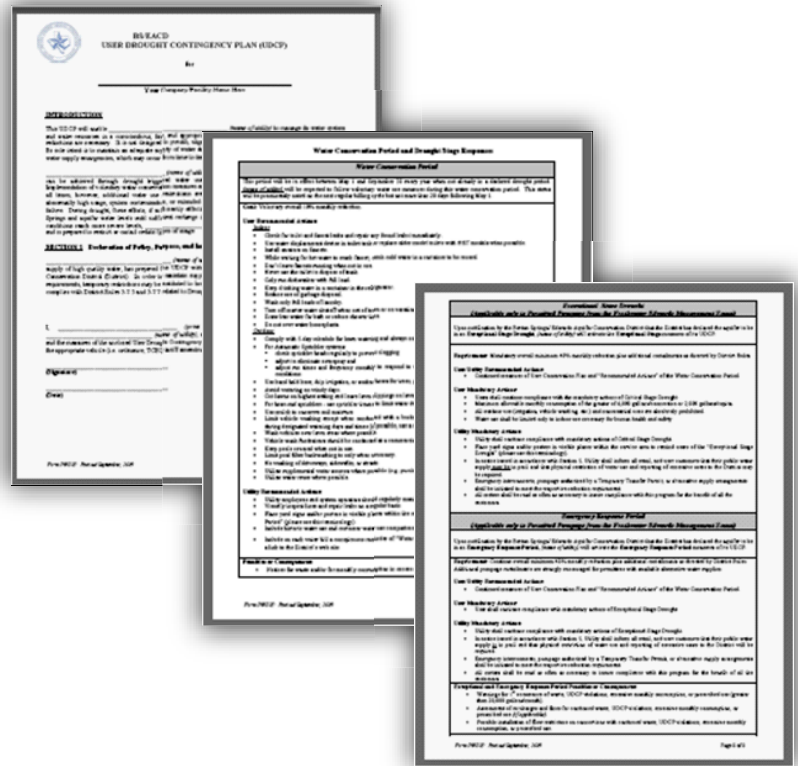


Figure 7. Pages from the User Drought Contingency Plan Template available on the web at www.bseacd.org/regulatory_info/drought_management.

Water-Mart WSC			Drought Stage Target Pumpage Volume				
Historical Permitted Pumpage: 10,000,000 gallons/year			Water Con. Period	Alarm Stage	Critical Stage	Exceptional	Emergency
Percentage of annual pumpage based on comparable well use	Baseline	10% Reduction (Voluntary)	20% Reduction	30% Reduction	40% Reduction	Response Period	
September	10.0%	1,000,000	900,000	800,000	700,000	600,000	600,000
October	8.3%	830,000	747,000	664,000	581,000	498,000	498,000
November	7.0%	700,000	630,000	560,000	490,000	420,000	420,000
December	6.3%	630,000	567,000	504,000	441,000	378,000	378,000
January	6.3%	630,000	567,000	504,000	441,000	378,000	378,000
February	6.5%	650,000	585,000	520,000	455,000	390,000	390,000
March	6.6%	660,000	594,000	528,000	462,000	396,000	396,000
April	7.4%	740,000	666,000	592,000	518,000	444,000	444,000
May	8.0%	800,000	720,000	640,000	560,000	480,000	480,000
June	9.5%	950,000	855,000	760,000	665,000	570,000	570,000
July	12.1%	1,210,000	1,089,000	968,000	847,000	726,000	726,000
August	12.0%	1,200,000	1,080,000	960,000	840,000	720,000	720,000
Totals:			9,000,000	8,000,000	7,000,000	6,000,000	6,000,000

Figure 8. Sample Pumpage Chart shows the maximum monthly pumpage allocated for Water-Mart WSC during a Stage II Alarm Drought for the month of May.



Recharge to Local Water Sources: A Comparison of Groundwater and Surface Water Reservoirs

'Recharge' is the term used to describe replenishing a water source. Typically, when we talk about water recharging an aquifer or a lake after a significant rainfall, we are referring to the increase in water stored in the aquifer or lake. In Central Texas, people rely on both groundwater (stored in an aquifer) and surface water (stored in lakes) as their source of water. Interestingly enough, recharge to aquifers and lakes are limited in different ways. The majority of homeowners in our area get their water from groundwater through an individual well or water utility with public supply wells or from surface water through Lower Colorado River Authority (LCRA) or the City of Austin.

In these dry times, every drop counts. Understanding how rainfall recharges our water sources can help shed light on drought restrictions. The number of end users, available volume, drainage area, and recharge limitations are the most substantial differences between local groundwater and surface water supplies (Fig. 9).

	Highland Lakes (surface water)	Barton Springs segment of the Edwards Aquifer (groundwater)
End Users	650,000 people	60,000 people
Available volume	1,500,000 acre-feet per year	6,600 acre-feet per year
Drainage Area	38,800 square miles 31,828 square miles above Buchanan 6,972 square miles between Travis and Buchanan	385 square miles 287 square miles in the Contributing Zone 98 square miles in the Recharge Zone
Recharge Challenges	Soil must be saturated to allow runoff to fill tributaries and lakes.	Soil must be saturated to allow runoff to produce stream flow. Once creeks flow across the recharge zone, water enters the aquifer through caves and fractures in the creek bottoms.

Figure 9. Comparison of local water sources and their characteristics.

The majority of surface water in the area comes from the Highland Lakes (main storage reservoirs: Lake Buchanan and Lake Travis) managed by the LCRA. The LCRA can distribute up to 1.5 million acre-feet per year from Lake Buchanan and Lake Travis. The Highland Lakes supply drinking water for about 650,000 people, as well as water for industry, energy, and recreation; for irrigating rice and other crops; and for preserving a healthy ecosystem along the lower river and in Matagorda Bay. Inflows from surface runoff and tributaries recharge the system of lakes. The drainage area, or area contributing runoff and stream flow, to Lake Buchanan and Lake Travis is approximately 38,800 square miles. The large drainage area increases the possibility of recharge during a rain event, because rain falling anywhere in the drainage basin will recharge the lakes—provided there is enough rain to saturate the soil and produce runoff.

The majority of groundwater in the area comes from the Barton Springs segment of the Edwards Aquifer and is managed by the Barton Springs/Edwards Aquifer Conservation District. The Edwards Aquifer of central Texas is subdivided into the Northern, Barton Springs, and San Antonio segments. The Barton Springs segment is bounded on the south by a groundwater divide near Kyle and to the north by the Colorado River. Approximately 60,000 people depend upon water from the Barton Springs segment of the Edwards Aquifer as their primary source of water, and the Barton Springs complex is the only known habitat for the endangered Barton Springs salamander. The Barton Springs segment has a drainage area of approximately 385 square miles—287 square miles in the Contributing Zone and 98 square miles in the Recharge Zone itself. While there are nearly 300 miles of drainage area, there are only 98 square miles where water can actually enter the aquifer through the caves and fractures in the creek beds within the Recharge Zone. Because water must enter through these discrete openings, recharge to the aquifer is more limited than recharge to a surface water reservoir. Rain has to fall in the right location long enough to allow surface runoff to fill the creeks that cross the Recharge Zone.

- ROBIN GARY, PUBLIC INFORMATION
AND EDUCATION COORDINATOR

