July 22, 2021

President Stansberry and Directors
Barton Springs Edwards Aquifer Conservation District
1124 Regal Row
Austin, Texas 78748

Re: Comments on proposed Desired Future Conditions for Groundwater Management Area 10

Dear President Stansberry and Directors:

Save Our Springs Alliance submits these written comments on setting the Desired Future Conditions for the Northern Subdivision of the Freshwater Edwards and Trinity Aquifers. We appreciate the Board's consideration of these comments, and the Board's efforts in ensuring that we plan for the long-term resilience of our water resources.

We want to begin by recognizing the critical role the District plays in managing our local groundwater resources. We commend the work being done at the District to protect the Edwards and Trinity Aquifers, their springs and contributing springs, and the endangered species living therein.

Overall, we note that the 2021 proposed DFCs are the same as those adopted in 2017. However, new information has come to light that warrants a reconsideration of the DFCs. Briefly, that new information consists of:

- The District's Final Habitat Conservation Plan and accompanying Environmental Impact Statement, approved in July 2018
- Updated research on the relationship between the Blanco River and Barton Springs segment of the Edwards Aquifer (2019)
- Updated climate change reports and modeling
- Recent science on the hydrogeologic interaction between the Edwards and Trinity Aquifers (2020)
- Discovery of Barton Springs salamanders in Trinity Aquifer springs

a. <u>Edwards (BFZ) Northern Subdivision</u>

On the merits of the proposed DFCs for the Edwards (BFZ) Northern Subdivision, we respectfully submit the following key points:

1. Effects on Endangered Salamanders

We are concerned that the minimum flow during extreme drought conditions of no less than 6.5 cubic feet per second (cfs) averaged on a monthly basis is not sufficiently rooted in either the science of groundwater modeling or biological levels sufficient to protect the two endangered salamanders that inhabit the aquifer. As the 2016 Explanatory Report notes, this figure was derived from estimating the water budget during the drought of record (11.7 cfs) and subtracting pumping from exempt wells (0.5 cfs) and permitted wells that would be allowed a maximum pumping of 4.7 cfs. (GMA 10 2016).

The withdrawal curtailments under "drought of record" conditions are not enough to guarantee persistence of the two federally listed endangered salamanders that live in Barton Springs, the Barton Springs salamander (*Eurycea sosorum*) and Austin blind salamander (*Eurycea waterlooensis*). The lowest average monthly springflow during drought of record conditions was 11 cfs. (U.S. FWS 2018). It is not known whether salamanders as a species would survive under sustained lower springflow.[1] We urge the District to adopt DFCs that set a minimum springflow during extreme drought conditions of no less than 10 cfs averaged on a monthly basis. [2]

The best available science shows us that the salamanders are greatly harmed by low dissolved oxygen levels (and possibly other conditions) that occur at and below a flow of approximately 10 cfs. The Environmental Impact Statement (EIS) for the District's Incidental Take Permit at Table 4-1 (p. 4-8) shows the Barton Springs Discharge thresholds and predicted levels of impact on the endangered salamanders. (U.S. FWS 2018). At 6.5 cfs, the mortality rate of salamanders is 50%. (*Id.*) As we noted in our 2017 comments on the HCP, this is an unacceptable level of mortality. Recent science shows that salamander populations do not rebound quickly once drought has subsided.[3] (Dries & Colucci 2018). If salamander populations reduce to a certain threshold during drought conditions, the effects could be irreversible and the salamander extinct forever.

[1] Although we acknowledge that the cfs has likely historically dropped lower than the lowest recorded monthly average of 11 cfs, present-day considerations of pollution and habitat contamination warrant taking a more conservative approach to proactively protect the salamanders. (*See, e.g.,* Devitt et al. 2019; Dries & Colucci 2018).

[2] We recommend 10 cfs rather than 11 cfs because according to the EIS, 10 cfs would have the same DO levels and mortality rate as 11 cfs. (U.S. FWS 2018).

[3] "During this study, changes in abundance of salamanders [] did not occur immediately after cessation of drought; they lagged months behind increases in discharge. Therefore, direct and indirect effects of drought on salamanders may persist for some time after the return of higher aquifer discharge. The effects on long-term persistence of *E. sosorum* of the frequent, repeated, and extended droughts that are expected in the future [] may depend on not only the duration and frequency of drought, but also the duration of intervening non-drought conditions."

2. Updated Science on Groundwater & Surface-water Interactions

We are also concerned that more recent hydrologic and climate data have not been factored into the decision not to revise the DFCs. According to the 2016 Explanatory Report, "The water budget, and hence the Modeled Available Groundwater estimates, may be revisited should the influences of urban recharge, the dynamic southern boundary, and climate change be better understood and quantified." (GMA 10 2016).

In 2019, the Meadows Center for Water and Environment issued a report shedding more light on "the dynamic southern boundary," specifically, the interactions between the Blanco River and the Edwards and Trinity Aquifers. (Martin et al. 2019). It is beyond our current capacity to carefully study this report and interpret it into policy, but we do know that this report should be factored into the consideration of setting DFCs. Despite the new information, the same DFCs adopted in 2010 are again proposed. Based on our limited understanding, the Blanco River watershed has been shown to contribute to flow in Barton Springs during periods of low flow and drought which occur approximately 20% of the time. (Martin et al. 2019). Increasing pumping in the Trinity Aquifer threatens to decrease the flow in the Blanco River, which could in turn affect recharge to the Northern Edwards. (*Id*.) Such hydrologic impacts should be considered in setting DFCs. The dynamic relations among the Edwards and Trinity Aquifers and Onion Creek, as studied in a 2018 report by the District, also need to be considered in setting the DFCs. (*See* Hunt, Smith et al. 2017).

Furthermore, in the face of continued urban development, all of the spring-fed creeks and rivers need as much of their natural discharge as possible to be resilient to water-quality degradation. (Devitt et al. 2019). Water quantity is a huge factor that provides that resilience.

In SOS's comments on the 2010 proposed DFCs, we noted that District staff reported that historic use permittees holding 4.3 cfs of pumping rights currently have the ability to switch to other sources. While that number may have changed, it holds true that with diligence and cooperation among the District, its permittees, the City of Austin, and others, all or nearly all of historic pumping could be curtailed during times of extreme drought given adequate time to make this happen. Save Our Springs applauds the progress made so far towards this goal and encourages the District to continue its efforts.

3. Effects of Climate Change

As noted above, the 2016 Explanatory Report notes that the Edwards Aquifer water budget may be revised should the influences of climate change be better understood and quantified. Numerous recent studies show that climate change will have a significant impact on the Aquifer, and the water budget should be revisited and proposed DFCs adjusted accordingly.

SOS is concerned that the proposed DFCs do not adequately take into account the effects of climate change on the Edwards Aquifer. The proposed DFC refers to extreme drought conditions, including a recurrence of the drought of record; however, this does not

factor in climate science showing that extreme drought will be longer and more frequent in the future. (*See, e.g.*, Hayhoe 2014). The drought of record may no longer be a suitable benchmark against which to measure the driest conditions possible.

Understanding and predicting drought is difficult, but scientists agree that central Texas will experience prolonged droughts more frequently in the near future. A 2014 report commissioned by the City of Austin found that "the science is certain that" Austin will see "more frequent drought conditions in summer due to hotter weather." (Hayhoe 2014). The Intergovernmental Panel on Climate Change (IPCC) concurs that climate change will result in the southwestern United States experiencing longer dry periods. (Collins et al. 2013).

While climate change will induce prolonged droughts throughout the American southwest, the Edwards Aquifer is particularly susceptible to such droughts because of its shallow depth and high karst permeability. A 2020 University of Texas-funded research article observed this and noted that the Edwards Aquifer is "one of the most vulnerable aquifers to climate change impacts in the United States." (Nielsen-Gammon et al. 2020). Indeed, a 2018 study from the National Climate Assessment specifically identified increased droughts and degradation of endangered species habitat as probable impacts of climate change on the Edwards Aquifer. (Kloesel et al. 2018).

As scientists and technology continue to better understand the effects of climate change, it is imperative that the District takes climate change into account. Only proactive measures can ensure the long-term viability of the Aquifer for the people and wildlife that depend on it.

Based on these key points, we recommend a DFC of: "during extreme drought conditions, including those as severe as a recurrence of the drought of record, springflow of Barton Springs shall be no less than 10 cubic feet per second averaged on a monthly basis through 2080."

b. <u>Trinity Aquifer</u>

The proposed DFC for the Trinity Aquifer is average regional well drawdown not exceeding 25 feet during average conditions (including exempt and non-exempt use). We urge the District to adopt a DFC of: "no (zero) regional well drawdown" to protect private wells, flows in surface water and the Edwards Aquifer, and endangered species recently discovered in Trinity springs.

First, there is uncertainty about the localized impacts of an average 25-foot drawdown that necessitates a more conservative approach to protect local well owners. There is also some concern that the proposed DFC does not differentiate between the lower and middle Trinity Aquifers. The Hill Country Alliance comments on these issues in more detail, and SOS hereby incorporates those comments by reference.

Second, it is not clear that the proposed DFC takes into account the effects of Trinity drawdown on the Edwards Aquifer. The District's own scientists, in collaboration with the

Edwards Aquifer Authority and the City of Austin, have documented the connections between the Edwards and Trinity Aquifers. (Hunt, Smith et al. 2017). In addition to the Blanco River interactions discussed above, the Trinity Aquifer springs flow into Onion Creek, which then flows through the Edwards Aquifer Recharge Zone. (*Id*). Allowing drawdown of the Trinity Aquifer without considering how the Edwards is affected would not be responsible groundwater management.

In light of the Trinity-Edwards interactions as well as new salamander discoveries, the proposed DFC does not sufficiently take into account the ecological impacts of drawdown. In 2018, the City of Austin biologists published a report on new occurrences of the Barton Springs salamander at six spring sites in Hays County, including four spring sites along Onion Creek and one each on Bear and Little Bear Creeks.[4] These salamanders currently receive no protection. Drawing down of wells affects springflow, which could in turn affect salamanders. We urge the District to adopt DFCs that will protect the endangered Barton Springs salamanders inhabiting Trinity springs by allowing no drawdown.

In summary, Save Our Springs would like to see science and stakeholder input play a more prominent role in establishing DFCs. Despite a proliferation of data generated since these DFCs were first adopted, the proposed DFCs have not changed. And despite the District complying with the minimum public comment procedures, only a few comments likely will be received.

c. <u>Improvements to the Public Commenting Process</u>

Finally, we offer some general advice to enhance public participation in this important process. First, we ask you to take a bit more time for this process. We recognize that you are pressured by the timeline set by the state. However, this is an extremely important action by the Board, and we are concerned that it has received so little input from other stakeholders and interested members of the public. The relevant statute requires a public comment period of "not less than 90 days," but does not prohibit longer public comment periods. *See* Tex. Water Code § 36.108(d-2)**.** Public participation is especially important given that, in the District's own words, "DFCs express local and regional 'policy' side of groundwater management."

We also believe there should be more media attention surrounding the public hearing and available public comment period. It is our understanding that no public comment was made orally at the June 10, 2021 hearing on DFCs for GMA 10, despite the option this round to present comments online. This is probably a result of both the inherent confusion of this still relatively new process and the very limited news coverage of your efforts. We encourage the District to contact media outlets and issue press releases to help the public understand the mechanics and importance of the DFC process.

[4] The four springs at which the Barton Springs salamander was newly discovered are Emerald Spring, Bello Spring, Pearly's Spring, and Ben McCulloch Spring. (Devitt & Nissen 2018).

Also, we appreciate the District's webpage dedicated to information about DFCs; however, we are concerned the public is not aware of this resource. For future public comment periods, we encourage the District to make this information more prominent, with a link to the site included on the Notice of Hearing.

Thank you for your consideration and for your service to our community.

Very best regards,

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References:

Collins, M. et al., *Chapter 12: Long-term Climate Change: Projections, Commitments and Irreversibility*, Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2013).

Devitt, T.J. et al., *Species delimitation in endangered groundwater salamanders: Implications for aquifer management and biodiversity*, Proceedings of the National Academy of Sciences (Feb. 2019).

Devitt, T.J. & Nissen, B.D., *New occurrence records for* Eurycea sosorum *Chippindale, Price & Hillis 1993 (Caudata, Plethodontidae) in Travis and Hays counties, Texas, USA*, Check List 14(2): 297-301 (Mar. 2018).

Dries, L.A. & Colucci, L.A., *Variation in Abundance in the Barton Springs Salamander Associated with Flow Regime and Drought*, Herpetological Conservation and Biology 13(1): 302-316 (Apr. 2018).

GMA 10, *Explanatory Report for Proposed Desired Future Conditions of the Fresh Edwards (Balcones Fault Zone) Aquifer in Northern Subdivision* (2016).

Hayhoe, K., *Toward a Climate-Resilient Austin*, City of Austin Office of Sustainability (May 2014).

Hunt, B., Smith, B., Gary, M. et al., *Surface-water and Groundwater Interactions in the Blanco River and Onion Creek Watersheds: Implications for the Trinity and Edwards Aquifers of Central Texas*, Bulletin of the South Texas Geological Society (Jan. 2017).

Kloesel, K. et al., *Chapter 23: Southern Great Plains*, Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment 2: 987-1035 (2018).

Martin, N.D. et al., *Blanco River Aquifer Assessment Tool: A Tool to Assess How the Blanco River Interacts with its Aquifers: Creating the Conceptual Model*, The Meadows Center for Water and the Environment - Texas State University (Sept. 2019).

Nielsen-Gammon, J. et al., *Unprecedented Drought Challenges for Texas Water Resources in a Changing Climate: What Do Researchers and Stakeholders Need to Know?*, Earth's Future 8(8) (June 2020).

Tian, L., Smith, B., Hunt, B., Doster, J., Gao, Y., *Geochemical Evaluation of Hydrogeologic Interaction Between the Edwards and Trinity Aquifers Based on Multiport Well Assessment in Central Texas*, 16th Sinkhole Conference NCKRI Symposium 8: 269-277 (Apr. 2020).

U.S. Fish & Wildlife Service, *Environmental Impact Statement for the Barton Springs/Edwards Aquifer Conservation District Habitat Conservation Plan* (May 2018).